

Itemiser[®] 4DX-CEP

User's Guide



About this Guide

This document is a complete guide to operating the Itemiser® 4DX trace detection device.

It is intended for all staff responsible for operating, maintaining, and administering the device, and includes information on:

- Itemiser® 4DX components, features, and specifications
- How to use the device to screen for prohibited substances
- A complete explanation of all menus, buttons, and functions
- A list of warnings and how to resolve them
- How to perform routine maintenance
- Contact information for Rapiscan Customer Service and Technical Support
- How to receive the device, install it, and bring it into operation

There is a complete index at the end of this guide.

Configuration-Specific Information

Rapiscan Systems offers the Itemiser® 4DX in different versions in order to meet the requirements of different customers and regulatory agencies. As a result, some screen images in this document might differ slightly from those displayed by your device. There may also be slight differences in other information presented in this guide. You can safely ignore any such minor differences, as they do not affect the operation or function of the device.

Conventions

This guide uses the following conventions:

- **Bold type** indicates screen elements that accept your actions (buttons and fields)
- *Italic type* indicates the names of windows and other screen elements
- ***Blue italic type*** indicates a link to another section of the document (if you are viewing the electronic version of this guide, you can click the link to go to that section)

In addition, this guide uses the term “device” to refer to the Itemiser® 4DX detection device.

Credentials and Access

To maintain security, the Itemiser® 4DX requires all users to have a user ID and password in order to log on to the device. In addition, all users are assigned a user level, which governs their level of access to information and functions on the device.

Please contact your supervisor or system administrator for any questions regarding your credentials or level of access.

Your Organization's Procedures

This guide does not include any information on procedures specific to your organization, including alarm resolution procedures, maintenance schedules, and others. Please contact your supervisor or system administrator for information on your organization's procedures.

Other Sources of Help

The Itemiser® 4DX includes an electronic copy of this guide stored on the device itself. To view this guide, press the **Help** button (on the main window).

In addition, Rapiscan Systems offers a variety of other documentation as well as classroom training sessions. Contact Rapiscan Systems Customer Service to learn more.

Questions and Comments

Rapiscan Systems has made every effort to ensure that this guide is complete and correct. However, if you have any comments or suggestions, please email them to:

rapiscanuserdocumentation@rapiscansystems.com

Your comments and suggestions are most welcome.

PREFACE | Itemiser® 4DX User's Guide

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Software license agreement	The product contains a Linux operating system and is distributed under the GNU General Public License.
Intended use	Use this product only for the purpose it was designed for; refer to the data sheet and user documentation. For the latest product information, contact your local supplier. or visit us online at www.rapiscansystems.com
FCC compliance	This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. You are cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

EMC directive

The European Union directive on electromagnetic compatibility (2004/108/EC) requires non-European manufacturers to designate an authorized representative in the Community.

Our European representative: Rapiscan Systems., Granary House, Station Road, Great Shelford, Cambridge, CB22 5LR, UK.



The European directive **Waste Electrical and Electronic Equipment (WEEE)** aims to minimize the impact of electrical and electronic equipment waste on the environment and human health. For proper treatment, recovery, and recycling, return the equipment marked with this symbol to your local supplier upon the purchase of equivalent new equipment, or dispose of it in designated collection points.

This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling return the battery to your supplier or to a designated collection point.

Regulatory



CONTENTS

About this Guide

Configuration-Specific Information	iii
Conventions	iv
Credentials and Access	iv
Your Organization's Procedures	iv
Other Sources of Help	iv
Questions and Comments	v

CHAPTER 1

Device Overview

Itemiser® 4DX Overview	2
Major Components	3
Front Panel	3
Side Panel	4
Rear Panel	4
Other Hardware	5
Software	6
Sample, Calibration, and Verification Traps	6
Important Notes	7
Device Specifications	8
Lamp Operating Life	9
Warnings and Cautions	10
Battery Charger Warnings	10
Storage	11
Storing the Dopants	11
Storing the Device	12

Shipping the Device	13
Related Documentation	13

CHAPTER 2

Analyzing Samples

CONOPS Notice	16
Getting Started	16
Powering On the Device	16
Using an Electrical Outlet	16
Using the Vehicle Power Adapter	19
Logging On	20
Traps	21
Avoiding Contamination	22
Preparation	23
Your Workspace	23
Gloves	23
Traps	24
Wand	24
After an Alarm	24
Sampling	24
Sampling by Hand	25
Sampling Using the Wand	27
Clearing an Alarm	29
Sampling Sequence	30
Alarm Sequence	30
No-Alarm Sequence	31

CHAPTER 3

Menu Functions

Main Window Functions	35
Clear	37
Clearing an Alarm	37
Clearing a Trap	39
Data	40
Help	41
Lamp Indicator	41
Lamp On/Off	41
Lamp Lifetime	42

Lamp Status	42
Log Off	43
Shutting Down the Device	44
Logging On	46
Failed Log-On Attempts	47
Warm-Up Time	48
Menu	49
Sound Indicator	50
Trap Counter	52
Trigger	52
View	53
List View	54
Plasmagram View	56
Intensity Map View	58
3-D View	60
View and Copy Options	61
Menu Functions	62
Adjust Date & Time	62
Advanced Menu	64
Calibrate Pumps and Flows	67
Calibrate Pumps and Flows—Dual Flow Meter	68
Calibrate Pumps and Flows—Single Flow Meter	75
Calibrate Purge Flow	81
Calibrate Sample Trap Sensor	81
Calibrate Temperatures	82
Calibrate Touchscreen	82
Cancel	84
Change Language	84
Config/Notes	86
Diagnostics and Logging	87
Exit ITMS	89
External Calibrate	89
FPGA Diagnostics	91
High Voltage Tab	92
Heater/Power Tab	93
Transducer Tab	95
History Data Export	97
Adding a Maintenance Log Entry	98
Printing Statistics	100

Printing History	100
Exporting History Data	101
Analyzing Exported History Data	104
Purging History	105
Lamp Diagnostics	106
Internal Calibrate	107
Internal Calibration Check	108
Live Mode	109
Log Maintenance	110
Manual Calibrate	111
Single-Peak Calibration	120
Options	120
Password/Security Policy	126
Print	130
Random Search Generator	131
Recall	134
Remote Connect Settings	135
Restore All Default Settings	136
Restore Default Config	136
Safely Remove USB Hardware	138
Save	138
Set Default Calibration Factors	139
Set Device Name and Location	140
Set User Privileges	141
Show Network Name and IP	142
Statistics	143
Status	145
Substances	146
Adding Substances	147
Modifying Substances	153
Deleting Substances	154
Thermal Clean	154
Toggle Lamp	156
Upgrade Software	157
Users	159
User-Level Privileges	160
Adding Users	164
Modifying User Information	168
Deleting User Records	170

Restoring Default Users	170
Verify	171

CHAPTER 4

Warnings

Introduction to Warnings	174
Battery Low Warning	175
Calibration Warning	176
Detector Flow Warning	177
Dryer Warning	178
Hardware Error	179
Heater Warning	180
Lamp Calibration Warning	181
Lamp Warning	182
Purge Flow Warning	183
Sample Flow Warning	184
Stabilizing Temperature Warning	185
Stabilizing	186

CHAPTER 5

Maintenance

Introduction to Maintenance	189
Calibration	189
Monthly Maintenance	190
Log Off and Shut Down	190
Remove the Desorber and Nozzle	192
Check the Interface O-Ring	194
Replace the Mesh Screen	195
Clean the Desorber	198
Power On the Device	201
Calibrate the Pumps and Flows	202
Perform an Internal Calibration	202
Return to Operation	202
Six-Month Maintenance	203
Log Off and Shut Down	203
Remove the Desorber and Nozzle	203
Check the Interface O-Ring	203
Replace the Mesh Screen	204

Check the Positive Ion Dopant	204
Check the Negative Ion Dopant	205
Clean the Desorber	207
Power On the Device	207
Calibrate the Pumps and Flows	207
Perform an Internal Calibration	207
Return to Operation	208
As-Needed Maintenance	208
Install Printer Paper	208
Clean the Exterior of the Device	210
Check the Supply of Consumables	211
Calibrate the Touchscreen	211
Replace the Lamp	211
Replace the Lamp (Hot Swap)	217
Replace the Inlet Filters	223
Maintenance Reminders	226
Adding Dealer Contact Information	227
Maintenance Logs	229
Monthly Maintenance Log	230
Six-Month Maintenance Log	231
As-Needed Maintenance Log	232

APPENDIX A

Service and Support

Technical Support	234
Customer Service	235
Consumables	235
Warranty Information	235
Rapiscan Systems Locations	236
International Locations	236

APPENDIX B

Installation

Overview	238
Preparing the Location	238
Receiving the Device	239
Unpacking the Components	239
Installing the Dopants and Calibrant	240

Installing the Negative Ion Dopant	240
Installing the Positive Ion Dopant	241
Installing the Internal Calibrant	242
Installing the Lamp	244
Powering On the Device	248
Using an Electrical Outlet	248
Using the Vehicle Power Adapter	250
Logging On (Initial)	250

INDEX

CONTENTS | Itemiser® 4DX User's Guide

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CHAPTER 1

Device Overview

Itemiser® 4DX Overview	2
Major Components	3
Front Panel	3
Side Panel	4
Rear Panel	4
Other Hardware	5
Software	6
Sample, Calibration, and Verification Traps	6
Important Notes	7
Device Specifications	8
Lamp Operating Life	9
Warnings and Cautions	10
Battery Charger Warnings	10
Storage	11
Storing the Dopants	11
Storing the Device	12
Shipping the Device	13
Related Documentation	13

Itemiser® 4DX Overview

The Itemiser® 4DX is a compact, portable, trace detector designed and manufactured by Rapiscan Systems.



The device employs Ion Trap Mobility Spectrometry (ITMS™) technology, developed and patented by Rapiscan Systems, to detect and identify both explosives. To detect these substances, the device requires only a single sample, and completes its analysis in about 8 seconds.

The Itemiser® 4DX includes a full-color, tilting touchscreen and an integral printer. The lightweight design is easily portable, and includes an internal battery that provides up to one hour of operation.



NOTE

Note that the wand (part number M0001240) is approved for use with Itemiser®4DX devices using the **C10.06.011-CEP** (passenger) and **C10.06.14-CEP** (passenger and cargo) configurations only.

The configuration is always visible in the top right corner of the window.

Contact your supervisor or system administrator if you require additional information.

Major Components

The Itemiser® 4DX is a sophisticated trace detector packaged in a compact housing. The major components are arranged as follows:

- **Front panel** comprises the touchscreen and desorber slot; it also contains the printer and the handle.
- **Side panel** provides access to the lamp and filters.
- **Rear panel** includes the power and network connections, dopant chambers, and other components.

Additional components include:

- Other hardware
- Software

The following sections describe each of these components in detail.

Front Panel

The front panel of the Itemiser® 4DX includes the touchscreen, desorber slot, printer, and handle:



- **Touchscreen:** The touchscreen displays all menu functions. To perform a function or choose an option, touch it on the screen. The touchscreen also includes an alphanumeric keyboard feature; press the image of the keyboard to display it on the screen (and then use it as you would use a standard keyboard). The touchscreen folds down to make transporting the device easier.
- **Desorber slot:** When you insert a sample trap into the desorber slot, the desorber detects the presence of the trap. The desorber then heats the trap to vaporize any particles captured by the trap, and introduces the vaporized particles into the device to begin the process of detection and analysis.
- **Printer:** The thermal printer produces printed copies of various reports such as a *Session Log*, warnings, data and configuration, and alarm data.

- **Handle:** When the touchscreen is closed, the handle serves as a convenient way to carry the device. Always maintain clearance around the front panel sufficient to perform all required operations.

Side Panel

The side panel provides access to the lamp and the purge inlet filters.

Rear Panel

The rear panel includes power, peripheral, and network connections. It also includes ports for access to the calibrant and dopant tubes.

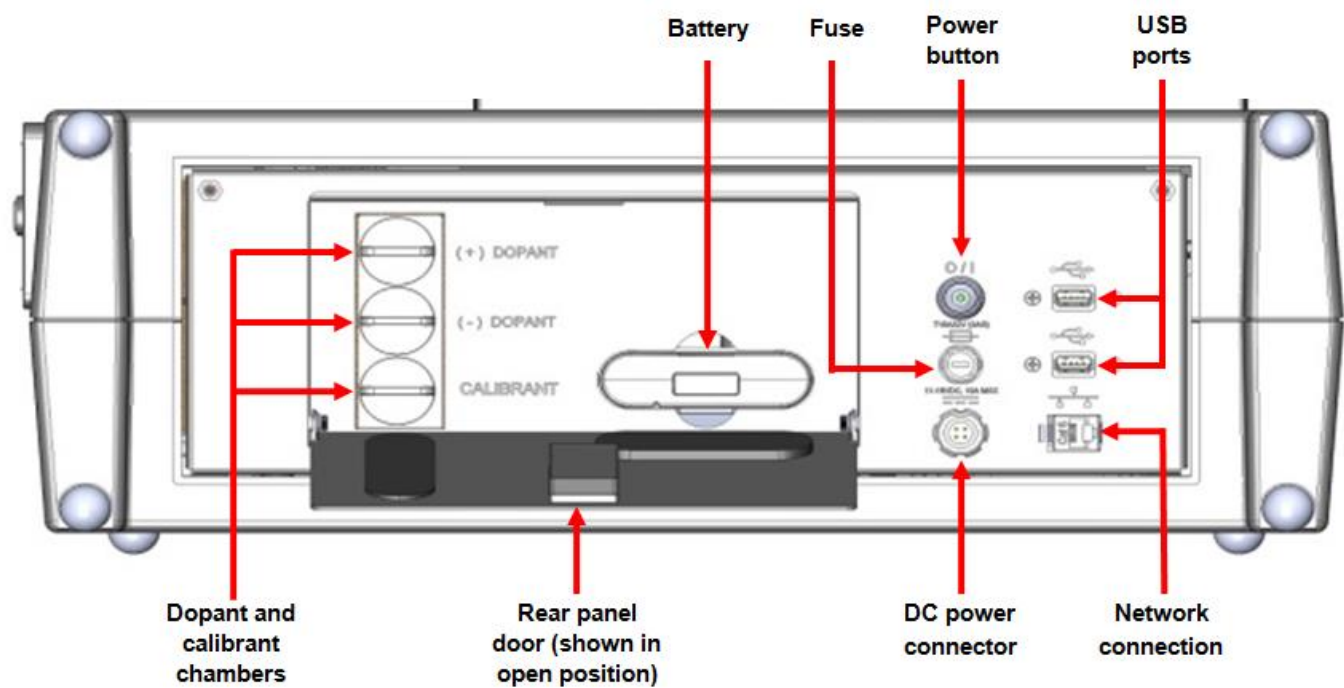


Table 1-1 *Rear panel components*

Component	Function
DC power connector	Accepts power from either the power supply (included with the device) or the vehicle power adapter (an optional accessory).

Component	Function
Power button	Press the power button to turn the device on; the green light integral to the button lights up. Press the power button again to turn the device off (always follow proper shut-down procedures). When the device is off, the green light on the power button goes out. NOTE: Leave the device powered on unless you do not need to use it for an extended period. This prevents contamination of the detector, and eliminates the need for the device to warm up.
Dopant and calibrant chambers	Provides access to the dopant and calibrant tubes used in the detection process.
USB ports	Use these ports to plug in USB devices (such as an external keyboard, printer, or storage device). You can also plug in a USB mouse and use it to select ITMS™ software functions.
Network connection	Connects the device to a network (standard CAT5e cable, RJ-45 connector).
Battery	Supplies power to the device for up to 1 hour. Use battery power while sampling or when you must move the device between locations. Do not use battery power to power on the device, as this can significantly reduce the life of the battery. In addition, the power required to heat the device to its operating temperature takes nearly the entire capacity of the battery, leaving little to no power for operations. Use the internal battery only when the device is already at its operating temperature and is displaying the <i>No Alarm-Ready</i> message.
Fuse	Protects the device from abnormal power conditions. Additional fuses are available in the Spare Parts Kit.

Other Hardware

The Itemiser® 4DX includes all the hardware required for standard operations:

- You can use the integral screen keyboard (touchscreen) for most functions, or you can use the external keyboard. The external keyboard is required for a few administrative functions.
- If you are responsible for checking flows (part of the maintenance procedure), you must use the external flow meter.

Some functions require additional hardware (these components are not included with the device):

- If you want to download information from the device to a personal computer, you must use a USB storage device.
- If you want to connect the device to a network, you must use a standard CAT5e network cable (RJ-45 connector).

You can purchase Itemiser® 4DX components and accessories through customer service ([see "Customer Service" on page 235](#)).

Software

The Itemiser® 4DX includes all software required for standard operations:

- ITMS software
- Linux

When a software upgrade for the device is available, Rapiscan Systems notifies field service engineers and other staff. You can purchase the upgrade kit through customer service ([see "Customer Service " on page 235](#)).

Sample, Calibration, and Verification Traps

You use sample traps to manually wipe the item you want to test for explosives.

When you wipe the sample trap across a surface of interest, it picks up microscopic traces of the substances present on the surface, even if these traces are embedded in the surface. You then insert the tapered end of the trap into the desorber slot to begin the analysis and detection process.

You also use sample traps as part of the process of clearing the device.

Sample traps have three holes at the handle end of the trap; always hold the trap in this area and avoid touching the sample area without clean, powder-free gloves.

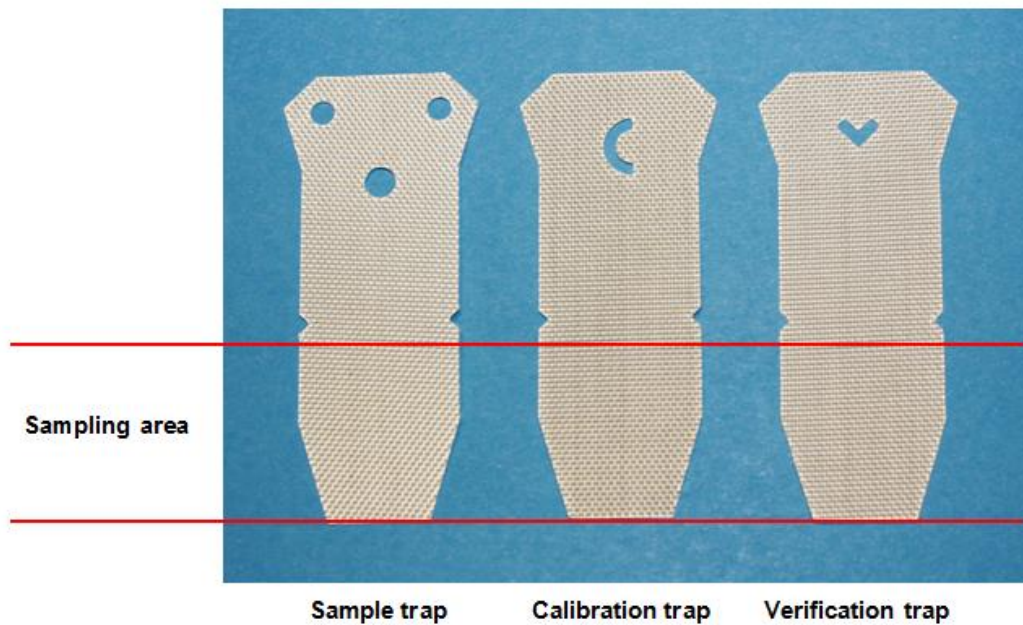
Calibration traps have test substances already placed on the sample area of the trap, and are only for calibrating the device. Calibration traps are marked with a *C* at the handle end of the calibration trap.

Similarly, verification traps already have test substances on them, and are used only for verifying the device's calibration. Verification traps are marked with a *V* at the handle end of the trap.



IMPORTANT

Never touch the sample area of a calibration or verification trap, or bring it into contact with any object or surface. The test substances used on these traps can contaminate anything they touch, and cause a false indication of the presence of explosives.



Important Notes

Always wear clean, powder-free gloves when handling traps. This reduces the transfer of skin oils and other contaminants.



IMPORTANT

The recommendation to use gloves is based on trace detection best practices; failure to use gloves may result in increased false alarms and system contamination.

These symptoms may result in increased service and maintenance requirements, which are the responsibility of the system owners to address.

Rapiscan Systems is not liable for any increased service and maintenance requirements resulting from the failure to use gloves.

Handle all traps by the handle (wide) end only—avoid touching the sample area of a trap unnecessarily.

Be especially careful with calibration or verification traps. Never touch any surface with these traps, and never touch the sample area itself. The test substances on these traps can contaminate the surface (or your gloves), and cause a false indication of the presence of explosives.

After you remove a trap from the package, close the package cover immediately to avoid contamination.

Store traps in a cool, dry place (maximum temperature of 24° C) to ensure their effectiveness.

Do not use traps that are past the expiration date printed on the bottom of the package (refer to the following table).

Table 1-2 *Trap shelf life*

Trap Type	Shelf Life	Number of Uses
Sample	Check the Best Used By date on the bottom of the package.	At least 20 sampling events, if none of the samples causes an alarm, and the sample trap is not visibly dirty, torn, wet, or damaged. If a sample trap causes an alarm, or when it is dirty, torn, wet, or damaged, discard it and resume sampling with a clean sample trap.
Calibration	12 months from date of shipment	1 use only
Verification	6 months from date of shipment	1 use only

Device Specifications

The following table lists complete specifications for the Itemiser® 4DX.

Table 1-3 *Device specifications*

Components	
Internal disk drive	Capacity: 120 GB (minimum)
Ethernet port	Input: Standard CAT5e cable, RJ-45 connector
External monitor port	Type: 15-pin female D-Sub
USB ports	USB 2.0 (2 ports)
Printer	Type: Thermal line printer Resolution: 8 dots/mm
Internal back-up battery	Run time (approximate): 1 hour Charge time (approximate): 7 hours (internal charger); 4 hours (optional external charger)
Environmental	
Operating environment	Temperature: 0–40°C Humidity: 0–95% (non-condensing) Altitude: 300 ft below sea level to 1.92 miles above sea level
Storage environment	Temperature: 0–50°C Humidity: 0–95% (non-condensing)
Protection rating	IP20
Dimensions	

Components	
Itemiser® 4DX(display open)	Size: 19.8 in (50 cm) deep X 18.9 in (48 cm) wide X 14.9 in (38 cm) tall Weight: 28.65 lbs (13 kg)
Itemiser® 4DX (display closed)	Size: 19.8 in (50 cm) deep X 18.9 in (48 cm) wide X 7.1 in (18 cm) tall Weight: 28.65 lbs (13 kg)
Power Requirements	
AC power supply	Input voltage: 100-240 VAC Frequency: 47-63 Hz Power consumption: 63 W (average); 150 W (maximum)
DC (optional vehicle power adapter)	Input voltage: 12-18 VDC Power consumption: 150 W (maximum) Fuse rating: F15A-125VDC (3AB)

Lamp Operating Life

The Itemiser® 4DX lamp has an operating lifetime of approximately 700 hours. This figure reflects the time that the lamp is actually on (the lamp is on whenever the device is powered on and the screen saver is not active).

Please note the following considerations:

- Lamp lifetime depends on the amount of time the lamp is on, and not on the length of time that the lamp is installed in the device or the number of samples processed.
- Skin oils on the lamp (from touching the lamp during installation or maintenance) can negatively affect system performance and decrease lamp lifetime.
- Operational attributes of the device can affect lamp lifetime, particularly if the dopant levels, flow rates, or lamp settings are out of specification.
- The lamp remains on until the device goes into screen saver mode. If you increase the screen saver interval (the default setting is five minutes), this increases the amount of time that the lamp remains on.

Always store lamps in their original packaging, at room temperature (20-26° C), and away from direct sunlight or any other source of ultraviolet light.

Warnings and Cautions

The following warnings and cautions apply to all operations involving the Itemiser® 4DX.

	WARNING	When the device is at its normal operating temperature, components and areas inside the device can reach temperatures of up to 200° C. Be extremely careful when working on or near hot surfaces.
	WARNING	Use appropriate electrical safety precautions when working near electrical components, particularly those inside the device.
	WARNING	Always turn off power to the device and disconnect the power cord before performing any maintenance.
	CAUTION	If the device is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.
	CAUTION	Always observe safe laboratory practices. Refer to the Safety Data Sheet (SDS) before handling any material. For copies of any SDS, contact Rapiscan Systems customer service (<i>see "Customer Service " on page 235</i>).
	CAUTION	The device is not intended for use outdoors during inclement weather.
	CAUTION	Comply with all applicable shipping regulations when shipping the device.
	CAUTION	Dispose of batteries within this product according to local regulations.

Battery Charger Warnings

The following warnings and cautions apply to the optional battery charger.

	WARNING	Do not expose the charger or power supply to water or liquids (the case is not waterproof or sealed).
	WARNING	Use only the manufacturer's power supply, and observe correct terminal polarity.
	WARNING	Do not cover the fan exhaust or obstruct the airflow. This can cause overheating. Place the charger in a cool spot, away from external heat sources.
	WARNING	Do not open the charger or power supply case. There are no user-serviceable parts inside.
	CAUTION	The charger typically becomes warm during the battery-charging process.

Storage

To ensure proper function and maximum life, store all device components, accessories, and consumables as described in the following sections.

Storing the Dopants

The following tables list the storage and operating life for the main consumables. Note that product life varies, depending on the environment and other factors.

For best results, do not store the positive dopant in the freezer for longer than 1 year.

Never store the negative dopant or calibrant in a freezer or in any location where the temperature might drop below 0° C.

The storage life figures in the following tables are based on plugs, tape, or other seals NOT being removed. Do not remove the plugs, tape, or other seals from any consumable until you are ready to install it in the device.



WARNING

Never store dopants with any material intended for human consumption.

Table 1-4 *Negative Dopant Storage and Operating Life*

Product Life (approximate*)	Conditions
Storage: Indefinite	Room temperature (20-26° C)
In device: 2 years	Device is in operation, or is in storage at room temperature (20-26° C)

Table 1-5 *Positive Dopant Storage and Operating Life*

Product Life (approximate*)	Conditions
Storage: 3 years	Freezer (0° C)
Storage: 2.25 years	Room temperature (20-26° C)
In device: 2 years	Device is in operation, or is in storage at room temperature (20-26° C)

Table 1-6 *Calibrant Storage and Operating Life*

Product Life (approximate*)	Conditions
Storage: Indefinite	Room temperature (20-26° C)
In device: 5 years	Device is in operation, or is in storage at room temperature (20-26° C)

*NOTE: Approximate is defined as +/-10% of the stated value.

Storing the Device

Storing the Itemiser® 4DX is necessary only when you do not intend to use the device for an extended period of time. Otherwise, leave the device powered on, as this prevents contamination and eliminates the delay required for the device to warm up.

Follow the procedure described here whenever you need to store the Itemiser®4DX:

1. Log off.
2. Shut down the device.
3. Turn off power to the device.
4. Allow the device to cool for at least 30 minutes.
5. Return the device to its original shipping container, or other suitable container.
6. Store the device in a clean, dry environment with an ambient air temperature between 0 and 50 °C.

Be sure to provide adequate security for the device at all times.

Shipping the Device

When shipping the device, you must adhere to the following procedures to remain in compliance with governmental and carrier regulations:

1. Log off.
2. Shut down the device.
3. Turn off power to the device.
4. Allow the device to cool for at least 30 minutes.
5. Remove the dopants from the device. If it is necessary to ship them, package them in their own container and ship them separately.
6. Remove the battery from the device and seal it in a plastic bag. Place the battery in its slot in the original shipping case, or ship it separately.
7. Place the device in its original shipping case.

These procedures ensure the safety of shippers, Rapiscan Systems service personnel, and anyone else handling the device.

Related Documentation

For a list of consumables used with the Itemiser® 4DX, see the *Itemiser Consumables Reference Guide* shipped along with the device ([see "Parts and Accessories" on page 1](#)).

Refer to the Remote Connect Console User's Guide (MA100100) for instructions on how to install, configure, and run the optional Remote Connect Console feature.

CHAPTER 2

Analyzing Samples

CONOPS Notice	16
Getting Started	16
Powering On the Device	16
Logging On	20
Traps	21
Avoiding Contamination	22
Sampling	24
Sampling by Hand	25
Sampling Using the Wand	27
Sampling Sequence	30
Alarm Sequence	30
No-Alarm Sequence	31

CONOPS Notice

This chapter of the user's guide (Chapter 2) describes how to collect and analyze samples using the Itemiser® 4DX device.

This chapter also functions as the Concept of Operations (CONOPS), in fulfillment of European Civil Aviation Conference (ECAC) regulatory requirements.

Contact your supervisor, system administrator, or Rapiscan Systems Technical Support (*see "Technical Support" on page 234*) if you require additional information.

Getting Started

Before you can begin sampling, you must power on the Itemiser® 4DX and log on, as described in the next two sections.

If you are already logged on, skip this section and (*see "Traps" on page 21*).

Powering On the Device

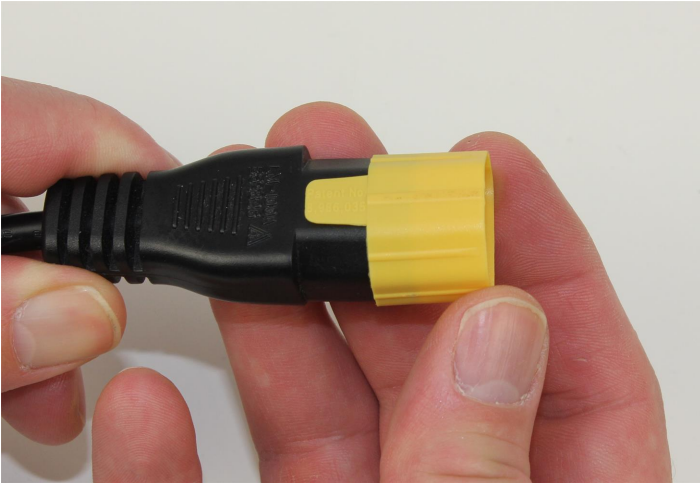
You can use either an electrical outlet or a vehicle to power the device.

Using an Electrical Outlet

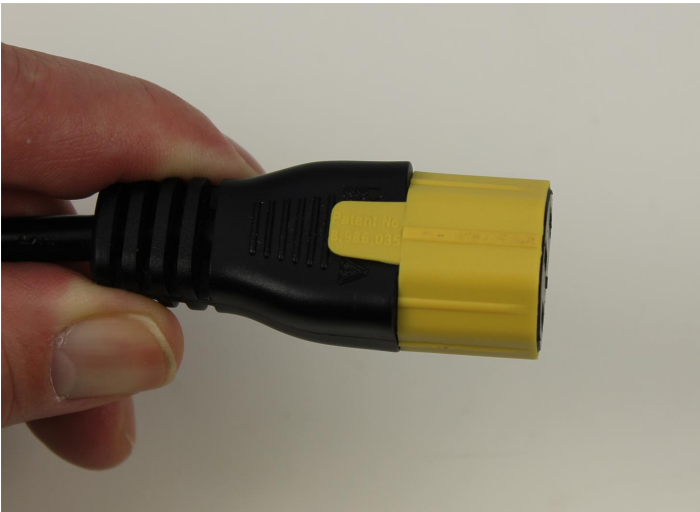
To power on the device using an electrical outlet:

1. Plug the power adapter into the rear panel of the device:
 - a. Align the dots on the power adapter cord with the dots on the DC Power receptacle on the rear panel of the device (*see "Rear Panel" on page 1*).
 - b. Push the connector firmly into the receptacle until it is fully engaged.

2. Push the power cord plug lock over the input end of the power cord.



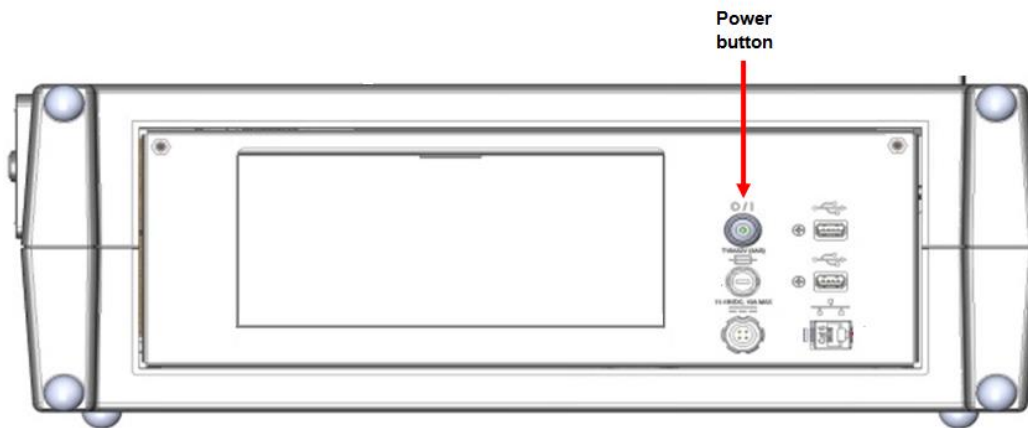
3. Ensure that the power cord plug lock is fully seated on the end of the cord.



4. Grip the power adapter firmly in one hand.
5. With your other hand, push the power cord into the socket on the power adapter (due to the snug fit, this requires considerable effort). Make sure that you push the cord in as far as it can go.



6. Plug the other end of the power cord into an AC electrical outlet supplying 90-264 VAC, 47-63 Hz.
7. Push the power button on the rear panel.



The green light on the power button is illuminated.
This completes the procedure.

Using the Vehicle Power Adapter

To power on the device using the vehicle power adapter:

1. Plug the vehicle power adapter cord into the rear panel of the device:
 - a. Align the dots on the vehicle power adapter cord with the dots on the DC Power receptacle on the rear panel of the device (*see "Rear Panel" on page 1*).
 - b. Push the connector firmly into the receptacle until it is fully engaged.
2. Ensure that the vehicle is running.
3. Plug the power supply cord into the vehicle's 12 VDC outlet.
4. Push the power button on the rear panel of the device.

The green light on the power button is illuminated.

This completes the procedure.

Logging On

To log on:

1. Type your user name in the **User Name** field.
2. Touch the **Password** entry box to highlight it.
3. Type your password.
4. Press **Log On**:

Itemiser® <Log> User Log On... Ver.

Sample Time: 00/00/0000 00:00:00 AM 00/00/0000 00:00:00 AM

User Name: mreynolds

Password: *****

1 2 3 4 5 6 7 8 9 0

q w e r t y u i o p

a s d f g h j k l Back

Shift z x c v b n m Log On

Shutdown

Depending on how long the device has been powered off, it may take anywhere from a few minutes to a few hours to warm up.

When the device is ready, the screen displays the *No Alarm - Ready* message:

Itemiser®		<Log>		No Alarm - Ready		Ver.	
		Explosives				mreynolds	
Sample Time: 00/00/0000 00:00:00 AM						00/00/0000 00:00:00 AM	
Trap count: 0		+		-		Reset	
Log Off		Clear		Trigger		Help	
						Menu	
						View ▾	
						Data ▾	
E1				OK			
E2/E3				OK			
E4				OK			
E5				OK			
E6				OK			
E7				OK			
E8				OK			
E9/E1				OK			
E3/E2				OK			

Note that the *No Alarm - Ready* message might be different, depending on your user level or device settings (see ["View" on page 53](#)).

The device is now ready for operation.

Note that if the screen displays a warning message instead, you must resolve it before you can begin using the device (see ["Introduction to Warnings" on page 174](#)).

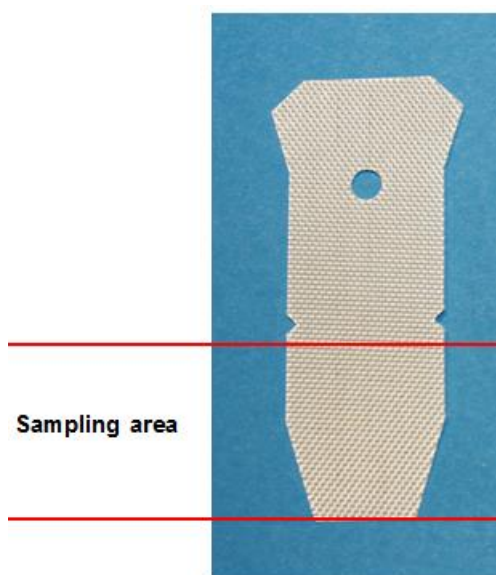
Traps

You use sample traps to manually wipe the surface or object you want to test for explosives or narcotics. When you wipe the sample trap across a surface of interest, it picks up microscopic traces of the substances present on the surface, even if these traces are embedded in the surface. You then insert the tapered end of the trap into the desorber slot to begin the analysis and detection process.

Before you begin sampling, make sure that you have a supply of sample traps readily available. Check the **Best Used By** date on the bottom of the package to ensure that the traps are not past their shelf life.

Always wear clean, powder-free gloves when handling traps. This reduces the transfer of skin oils and other contaminants.

Handle all traps by the handle (wide) end only—avoid touching the sample area of a trap unnecessarily.



Note that you can use traps for at least 20 samples, as long as the trap is not dirty, wet, torn, or otherwise damaged, and has not resulted in an alarm.

**WARNING**

Never re-use a trap that has resulted in an alarm, as this can lead to false alarms.

After you remove a trap from the package, close the package cover immediately to avoid contamination.

Avoiding Contamination

The Itemiser® 4DX is an extremely sophisticated device—it is so sensitive that it can detect one-billionth of a gram of explosives or narcotics.

Since the device is so sensitive, it is crucial that you maintain the highest level of cleanliness. If you don't, you might contaminate the device or items that come into contact with it (gloves or traps, for example). Such contamination can affect the detection performance of the device, and can also result in false alarms.

Always follow your organization's guidelines on avoiding contamination. The following sections provide some general guidelines that can help you to avoid contamination.

Preparation

At the beginning of your shift, make sure that you have everything you need nearby:

- Traps—make sure you have plenty, and check to make sure they aren't past the Best Used By date.
- Gloves—have several pairs.
- Alcohol wipes—keep a box of wipes nearby.
- Trash can—in the course of operations, you will be discarding traps, wipes, and other materials, so having a trash can nearby helps keep your working area free from contamination.

If you have to go somewhere else to get something you need, you run the risk of picking up contamination from everything you touch.

Your Workspace

At the beginning of your shift, use an alcohol wipe to clean the following:

- The exterior of the device.
- The surface that the device is sitting on.
- Any nearby table tops or other surfaces that you plan to use in your sampling activities.

Make sure to keep these items clean throughout your shift; if you think one might have become contaminated, clean it as soon as possible.

Gloves

Skin oils naturally attract dust and other particulates, some of which might result in contamination. Wearing gloves dramatically reduces this, and is highly recommended.



IMPORTANT

The recommendation to use gloves is based on trace detection best practices; failure to use gloves may result in increased false alarms and system contamination.

These symptoms may result in increased service and maintenance requirements, which are the responsibility of the system owners to address.

Rapiscan Systems is not liable for any increased service and maintenance requirements resulting from the failure to use gloves.

Follow your organization's guidelines of what gloves to wear; there are several different types, but any gloves you wear should be clean and powder-free.

Whenever you have handled a sample that results in an alarm, or whenever your gloves become visibly dirty, discard them and put on a new pair.

Traps

Follow these guidelines to avoid contaminating sample traps:

- Always close the package as soon as you've removed a trap.
- Avoid touching the sample area of the trap.
- Clean the package itself if it came into contact with anything that might contaminate it (for example, if you drop it on the floor).

For complete information on traps, ([see "Sample, Calibration, and Verification Traps" on page 6](#)).

Wand

If you are using the wand for sampling, follow these guidelines:

- Use an alcohol wipe to clean the wand at the beginning of your shift.
- Always clean the wand whenever you have used it to sample something that has resulted in an alarm.
- Always leave a clean sample trap mounted in the wand.
- Never touch the rubber pad at the end of the wand, or allow it to come into contact with any object or surface.

When you're not using the wand, put it on a clean surface.

After an Alarm

If the device detects a prohibited substance, use an alcohol wipe to clean the device exterior, your workspace, and anything else the sample might have touched. Discard your gloves, and put on a new pair ([see "Clearing an Alarm" on page 37](#)).

Sampling

Use a sample trap to collect trace particles from any surface or object of interest. The trap can collect these trace particles even if they are embedded in the surface.

You then insert the sample trap into the desorber slot to begin the detection and analysis process.

You can collect samples by hand, or by using the wand (the following sections describe these procedures in detail).



IMPORTANT

Your use of the Itemiser®4DX may be governed by a regulatory agency.

Note that different regulatory agencies have approved different methods of sampling (either sampling by hand only, sampling using the wand only, or sampling using either method).

Contact your supervisor or system administrator to ensure that you are operating the device in compliance with all applicable requirements.

Follow your organization's guidelines on which surfaces or objects to sample.

Sampling by Hand

To collect and analyze a sample by hand:

1. Put on a pair of clean, powder-free gloves (strongly recommended).



IMPORTANT

The recommendation to use gloves is based on trace detection best practices; failure to use gloves may result in increased false alarms and system contamination.

These symptoms may result in increased service and maintenance requirements, which are the responsibility of the system owners to address.

Rapiscan Systems is not liable for any increased service and maintenance requirements resulting from the failure to use gloves.

2. Obtain a clean sample trap (either new or used):
 - Use a new sample trap: Remove a sample trap from the package; close the package cover immediately to avoid contamination.
 - Re-use a sample trap: You can re-use a sample trap if it has not caused an alarm, and if it is not visibly dirty, torn, wet, or damaged.
3. Follow your organization's guidelines on what surfaces to sample. The following general considerations may be helpful:
 - For baggage and cartons, concentrate on handles, straps, latches, zipper tabs, closure flaps, and seams.
 - For electronic devices, concentrate on touch pads, buttons, latches, edges, vents, seams, and compartments (for example, compartments for batteries or disk drives).
 - Do not sample lenses or display screens (the trap might scratch or damage them).
4. Press the sample trap firmly into contact with the surface.

5. Wipe the sample trap across the surface, in one direction, one time.



6. Immediately insert the narrow end of the trap into the desorber slot.
The device displays the *Sampling* message.
7. When the screen displays the *Please Remove Sample* message, remove the sample trap.

**WARNING**

Avoid contact with the sampling area of the trap immediately after you have removed it from the desorber slot. As part of the detection process, the Itemiser® 4DX heats the sampling area of the trap to over 200° C, and it retains some of this heat for several seconds after you have removed the trap from the device.

**NOTE**

Do not remove the sample trap before the device displays the *Please Remove Sample* message. If you do, the device displays an invalid sample warning. You must then repeat the sampling procedure.

8. Note the results:
 - If the screen displays the *No Alarm-Ready* message, the device did not detect any prohibited substance, and is ready for the next sample.
 - If the screen displays the *Explosives Detected* message, resolve the alarm in accordance with your organization's procedures. Discard the sample trap immediately.

Refer to *Sampling Sequence* for the complete list of events associated with sampling ([see "Sampling Sequence" on page 30](#)).

This completes the procedure.

Sampling Using the Wand

The sample wand makes sampling hard-to-reach areas faster and easier, and also protects operators from exposure to potentially harmful substances. The wand uses standard sample traps.



NOTE

Note that sampling using the wand is subject to European regulatory requirements.

Contact your supervisor, system administrator, or Rapiscan Systems Technical Support ([see "Technical Support" on page 234](#)) if you require additional information.

To use the wand to collect and analyze a sample:

1. Put on clean, powder-free gloves (highly recommended).
2. Obtain a clean sample trap (either new or used):
 - Use a new sample trap: Remove a sample trap from the package; close the package cover immediately to avoid contamination.
 - Re-use a sample trap: You can re-use a sample trap if it has not caused an alarm, and if it is not visibly dirty, torn, wet, or damaged.
3. Press and hold the button on the top of the wand.
4. Insert the narrow end of the sample trap into the slot.



5. Release the button.

**IMPORTANT**

Avoid touching the sampling area of the sample trap when inserting it into or removing it from the wand.

6. Affix the hole in the wide end of the sample trap over the tab on the underside of the sample wand.



7. Sample the surface following your organization's sampling guidelines; make sure to hold the wand so that you obtain a valid sample:
 - Hold the wand at an angle so that only the sample trap—and not any part of the wand—comes into contact with the surface or object you want to sample.
 - Apply enough pressure to the wand to press the sample trap firmly into contact with the surface or object.
8. Wipe the sample trap across the surface, in one direction, one time.
9. When you are finished sampling, pull the handle end of the sample trap off of the tab on the underside of the wand.
10. Press and hold the button on the top of the wand.
11. Remove the sample trap from the wand.
12. Release the button.
13. Immediately insert the sample trap into the desorber.

The device automatically analyzes the sample.

14. When the screen displays the *Please Remove Sample* message, remove the sample trap.



NOTE

Do not remove the sample trap before instructed to do so. If you remove a sample trap prior to completion of the sampling cycle, the device displays an invalid sample warning and logs the event in the history file. In this case, you must repeat the sampling routine.

15. Observe the results:

- If the device detects a prohibited substance, the screen displays the *Explosives Detected* message in the status bar. Discard the sample trap immediately, and follow your organization's alarm resolution protocol ([see "Alarm Sequence" on the next page](#))
- If the device does not detect a prohibited substance, the screen displays the *No Alarm - Ready* message in the status bar; the device is ready for the next sample ([see "No-Alarm Sequence" on page 31](#))

This completes the procedure.

Clearing an Alarm

When the device displays an alarm message, follow your organization's alarm resolution protocol.

The device automatically records and saves all alarm events, unless you have changed the default *Options* settings.

After you have resolved the alarm in accordance with your organization's procedures, you must clear the alarm before the device is ready for further use:

1. Discard the sample trap and gloves that you used to collect the sample.
2. Use Rapiscan Systems-supplied alcohol wipes to decontaminate the work area.
3. Put on a new pair of clean, powder-free gloves.
4. Press **Clear**.

The screen displays the *Clearing* message for a few seconds.

The screen displays the *Sampling...* message for approximately 8 seconds.

5. When the screen displays the *Insert Clean Trap* message, insert a new sample trap into the desorber slot.
The screen displays the *Sampling...* message for approximately 8 seconds.
6. When the screen displays the *Please Remove Sample* message, remove the sample trap.

The device displays the *Clearing* message for a few seconds, and then displays the *No Alarm - Ready* message.

If the screen instead displays the *Clearing*, *Sampling*, and *Insert Clean Trap* messages, repeat steps 5 and 6 until the screen displays the *No Alarm - Ready* message.

**IMPORTANT**

If you cannot successfully complete this procedure, it might indicate that the device has been improperly calibrated, is contaminated, or is malfunctioning. Contact Rapiscan Systems technical support immediately ([see "Technical Support" on page 234](#)).

7. (Optional) To discontinue the clearing process at any point, press **Stop**.

**CAUTION**

Complete the entire clearing process if at all possible. If you stop the clearing process, the device cannot clear all of the detected substance. This can result in false alarms.

There are some alarm conditions that you cannot clear even after repeated attempts; in this case, perform a **Thermal Clean** procedure ([see "Thermal Clean" on page 154](#)) or contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

When the screen displays the *No Alarm - Ready* message, the device is ready to accept another sample.

This completes the procedure.

Sampling Sequence

The following sections describe the events that occur when a sample results in an alarm, and when a sample does not result in an alarm.

Alarm Sequence

The following sequence of events takes place when the device analyzes a sample and detects explosives:

1. The screen displays the **No Alarm - Ready** message.
2. You use a sample trap to wipe the area or object of interest.
3. You insert the sample trap into the desorber slot.
4. The screen displays the **Sampling...** message for a few seconds.
5. The screen displays the **Please Remove Sample** message.
6. You remove the sample trap.
7. The screen displays the **Explosives Detected** message.
8. You follow your organization's alarm resolution protocol.

Note that the device is not ready to accept another sample unit you have cleared it (when the device is cleared, it displays the **No Alarm - Ready** message).

No-Alarm Sequence

The following sequence of events takes place when the device analyzes a sample but detects no explosives:

1. The screen displays the **No Alarm - Ready** message.
2. You use a sample trap to wipe the area or object of interest.
3. You insert the sample trap into the desorber slot.
4. The screen displays the **Sampling...** message for a few seconds.
5. The screen displays the **Please Remove Sample** message.
6. You remove the sample trap.
7. The screen displays the **Analyzing...** message for a few seconds.
8. The screen displays the **No Alarm - Ready** message.

Whenever the screen displays the **No Alarm - Ready** message, the device is ready to accept another sample.

CHAPTER 3

Menu Functions

Main Window Functions	35
Clear	37
Data	40
Help	41
Lamp Indicator	41
Log Off	43
Menu	49
Sound Indicator	50
Trap Counter	52
Trigger	52
View	53
Menu Functions	62
Adjust Date & Time	62
Advanced Menu	64
Calibrate Pumps and Flows	67
Calibrate Purge Flow	81
Calibrate Sample Trap Sensor	81
Calibrate Temperatures	82
Calibrate Touchscreen	82
Cancel	84
Change Language	84
Config/Notes	86
Diagnostics and Logging	87
Exit ITMS	89

External Calibrate	89
FPGA Diagnostics	91
History Data Export	97
Internal Calibrate	107
Internal Calibration Check	108
Live Mode	109
Log Maintenance	110
Manual Calibrate	111
Options	120
Password/Security Policy	126
Print	130
Random Search Generator	131
Recall	134
Remote Connect Settings	135
Restore All Default Settings	136
Restore Default Config	136
Safely Remove USB Hardware	138
Save	138
Set Default Calibration Factors	139
Set Device Name and Location	140
Set User Privileges	141
Show Network Name and IP	142
Statistics	143
Status	145
Substances	146
Thermal Clean	154
Toggle Lamp	156
Upgrade Software	157
Users	159
Verify	171

Main Window Functions

The main window is the starting point for nearly all operations with the Itemiser® 4DX. The device displays the main window whenever you log on, and returns to the main window after you complete a procedure or close a menu window.

The top center portion of the main window displays the status bar, which indicates the status of the device.

When the status bar displays the *No Alarm - Ready* message, it indicates that the device is ready for operational use. If the screen displays any other message, it indicates one of the following conditions:

- The device is currently in an alarm condition (that is, it has detected an explosive or narcotic substance).
- The device is currently busy performing an operation.
- The device requires you to perform an action.
- The device requires maintenance.

The main window includes buttons for several primary functions, including *Log Off*, *Clear*, *Trigger*, *Help*, and *Menu*. The main window also displays a variety of other information, as shown in the following illustration.

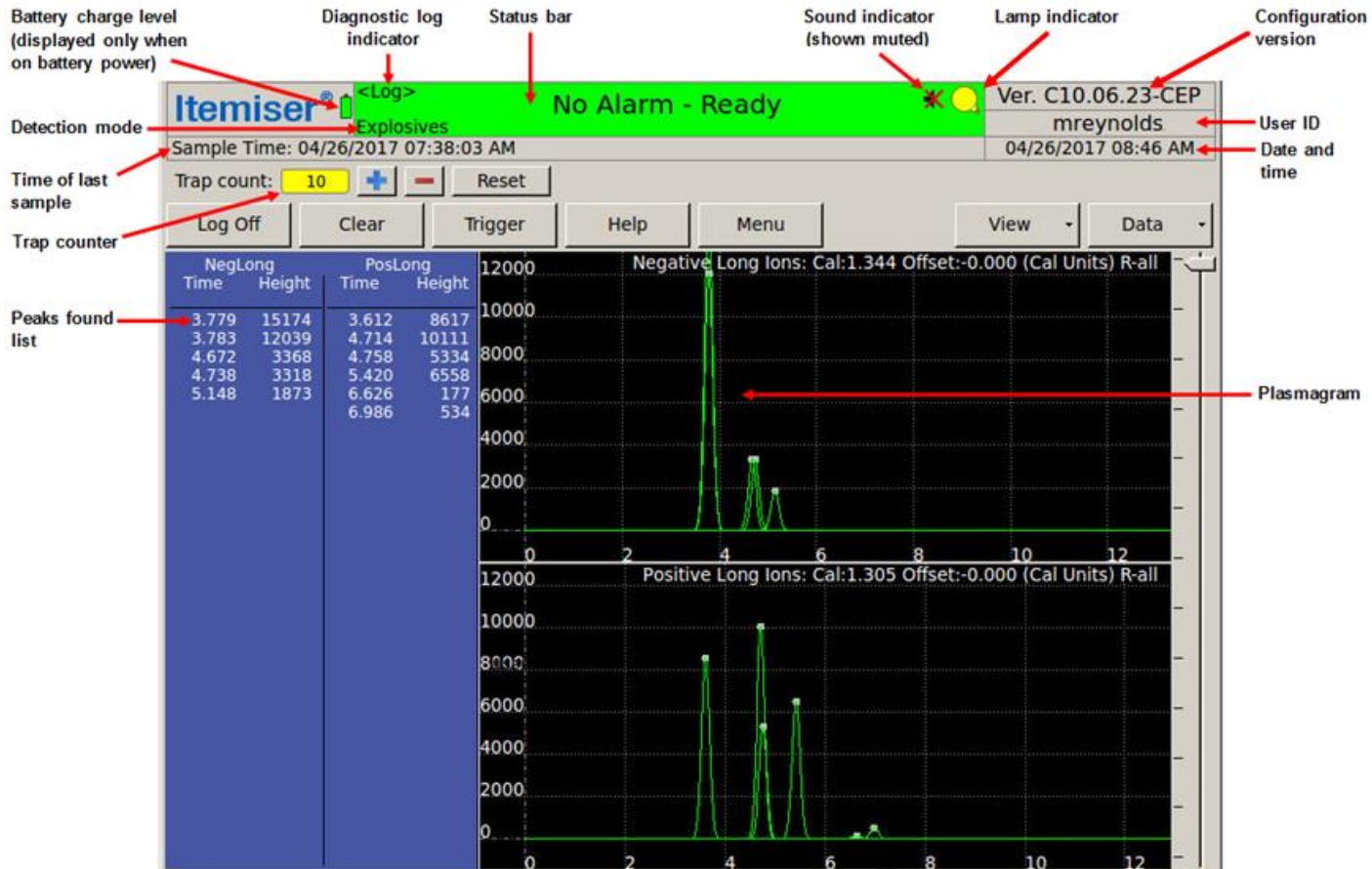


Table 3-1 *Main window information*

Component	Description
Battery charge level	Indicates the battery strength (the device displays this symbol only when it is operating on battery power).
Clear	Press this button to clear the device, return to the live display (from a recalled file), or clear a trap (see "Clear" on the facing page).
Configuration version	Displays the software version that the device is using. If you have the necessary permissions, you can press this area of the screen to see details on the software version and other operational details.
Data	Press this button to change the data displayed by the plasmagram view (see "Data" on page 40).
Date and time	Displays the current date and time.
Detection mode	Indicates that the device is configured to detect explosives.
Help	Press this button to view the on-line help (see "Help " on page 41).
Lamp indicator	Indicates whether the lamp is on (indicator is yellow) or the lamp is off (indicator is gray). As the lamp nears the end of its lifetime, the lamp indicator is part-yellow and part-gray; the gray portion of the indicator becomes progressively larger as the lamp approaches the end of its lifetime. Press the lamp indicator to view a display of lamp use and remaining lifetime (see "Lamp Indicator" on page 41).
Last sample time	Indicates the time of the last sampling event.
Log Off	Press this button to log off the device (see "Log Off" on page 43).
<Log>	Displays the status of the Diagnostic and Logging feature (see "Diagnostics and Logging" on page 87).
Menu	Press this button to view additional system functions (see "Menu" on page 49).
Peaks found list	Displays numerical information from the plasmagram view.
Plasmagram	Displays spectrum data about a sampling event (see "Plasmagram View" on page 56).
Sound indicator	Indicates that the device speaker is on or off (an X super-imposed on the speaker symbol indicates that the speaker is muted). Press the speaker symbol to activate the audio controls.
Status bar	Indicates the status of the device: • Green indicates that the device is ready for operation. • Yellow indicates that the device is busy or requires user action. • Red indicates that the device is in an alarm condition (it has detected explosives).

Component	Description
Trap counter	Automatically counts the number of traps inserted into the device. Press the plus sign to add 1 to the count; press the minus sign to subtract 1 from the count. Press Reset to reset the count to 0 (see "Trap Counter" on page 52).
Trigger	Press this button to initiate a sampling sequence; for test and maintenance purposes (see "Trigger" on page 52).
User name and ID	Displays the name and user level of the individual who is currently logged on.
View	Press this button to change the view of sampling events (see "View" on page 53).

If your user level includes the necessary permissions, you can press the software version to see the detection and substance configuration version, the detection and substance algorithm, the operating system image version, the software graphical user interface (GUI) version, and the Help package version.

If the screen displays the word **Custom*** in place of the version number, it indicates that modifications have been made to the default substance configuration.

Clear

The **Clear** button performs three separate functions:

- **Clearing alarms**—If the device is currently displaying an alarm message, press **Clear** to clear the alarm condition and return the device to operational use ([see "Clearing an Alarm" below](#)).
- **Closing recalled files**—If the device is currently displaying a recalled file, press **Clear** to close the recalled file and show the live display ([see "Recall" on page 134](#)).
- **Cleaning traps**—If a trap that you know to be clean is producing a false warning message, press **Clear** to clean the trap of any contaminants so that you can use it for sampling ([see "Clearing a Trap" on page 39](#)).

Clearing an Alarm

When the device displays an alarm message, follow your organization's alarm resolution protocol.

The device automatically records and saves all alarm events, unless you have changed the default *Options* settings.

After you have resolved the alarm in accordance with your organization's procedures, you must clear the alarm before the device is ready for further use:

1. Discard the sample trap and gloves that you used to collect the sample.
2. Use Rapiscan Systems-supplied alcohol wipes to decontaminate the work area.
3. Put on a new pair of clean, powder-free gloves.
4. Press **Clear**.

The screen displays the *Clearing* message for a few seconds.

The screen displays the *Sampling...* message for approximately 8 seconds.

5. When the screen displays the *Insert Clean Trap* message, insert a new sample trap into the desorber slot. The screen displays the *Sampling...* message for approximately 8 seconds.
6. When the screen displays the *Please Remove Sample* message, remove the sample trap.

The device displays the *Clearing* message for a few seconds, and then displays the *No Alarm - Ready* message.

If the screen instead displays the *Clearing*, *Sampling*, and *Insert Clean Trap* messages, repeat steps 5 and 6 until the screen displays the *No Alarm - Ready* message.

**IMPORTANT**

If you cannot successfully complete this procedure, it might indicate that the device has been improperly calibrated, is contaminated, or is malfunctioning. Contact Rapiscan Systems technical support immediately ([see "Technical Support" on page 234](#)).

7. (Optional) To discontinue the clearing process at any point, press **Stop**.

**CAUTION**

Complete the entire clearing process if at all possible. If you stop the clearing process, the device cannot clear all of the detected substance. This can result in false alarms.

There are some alarm conditions that you cannot clear even after repeated attempts; in this case, perform a **Thermal Clean** procedure ([see "Thermal Clean" on page 154](#)) or contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

When the screen displays the *No Alarm - Ready* message, the device is ready to accept another sample.

This completes the procedure.

Clearing a Trap

In the event that a clean sample trap causes the Itemiser® 4DX to falsely display an alarm message, use the following procedure to clear the trap. This can occur due to environmental conditions or other causes.



CAUTION

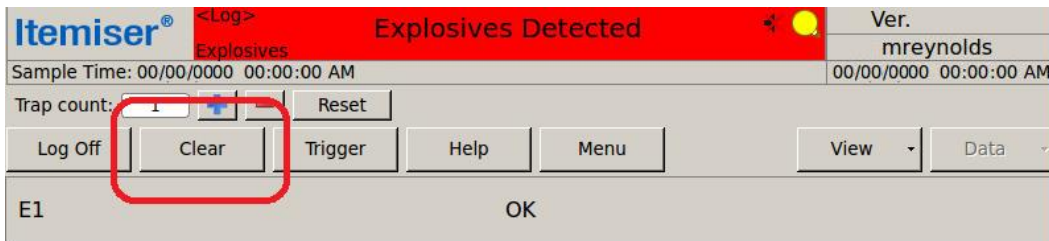
Never use this procedure on any trap that you have used to sample any surface.

Never attempt to re-use a trap that has caused an alarm.

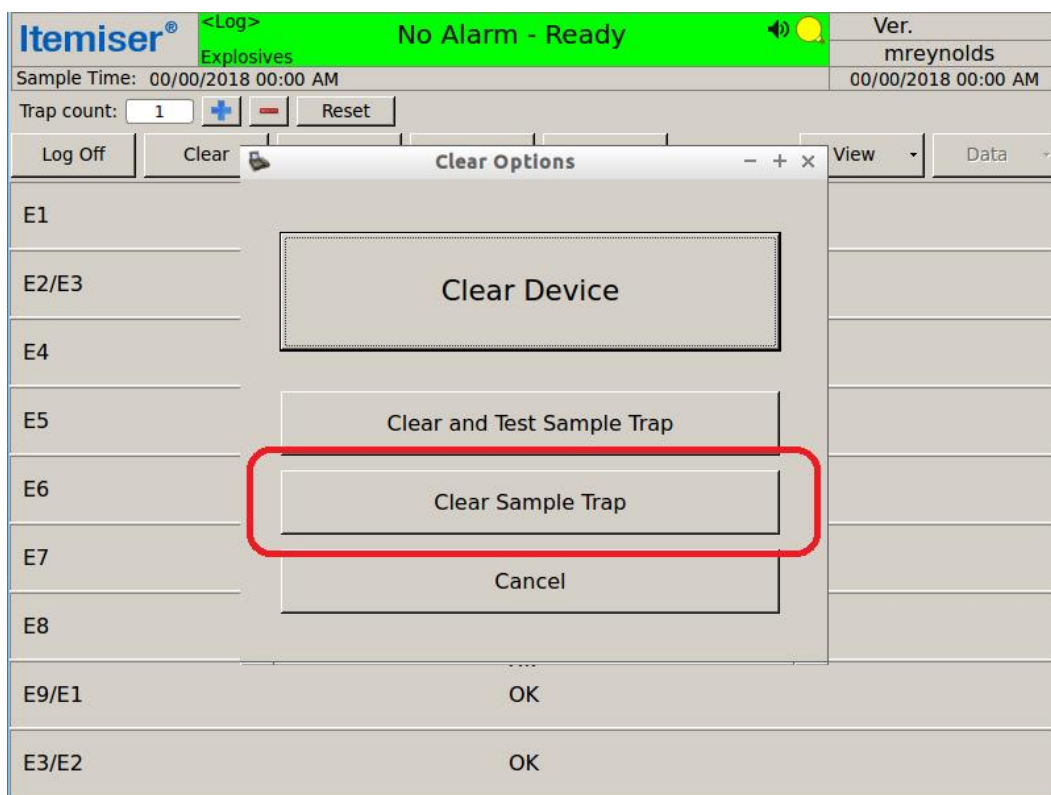
You must immediately discard any trap that has caused an alarm.

To clear a sample trap:

1. Ensure that the device is displaying the *No Alarm - Ready* message.
2. Press **Clear**:



The screen displays the *Clear Options* window.

3. Press **Clear Sample Trap**:

The screen displays the *Insert Sample Trap* message.

4. Insert the sample trap into the desorber.

The screen displays the *Clearing Trap* message, and starts a 10-second timer.

5. When the screen displays the *No Alarm - Ready* message, remove the trap. You can now use this trap for sampling.

If the screen does not display the *No Alarm - Ready* message, there might be a problem with the device. Remove the trap, and contact your service staff or Rapiscan Systems Technical Support immediately ([see "Technical Support" on page 234](#)). Clear the device before returning it to operation ([see "Clearing an Alarm" on page 37](#)).

This completes the procedure.

Data

Press the **Data** button to view additional negative and positive ion data in the plasmagram view ([see "Plasmagram View" on page 56](#)).

Only users at the supervisor, maintenance, and administrator levels have access to this function.

Help

Press the **Help** button on the main screen at any time to view the on-line help. The on-line help includes step-by-step instructions for virtually all Itemiser® 4DX functions. The left column of the screen is a table of contents view of the entire on-line user's guide. Click to navigate to the subject you want.

Lamp Indicator

The lamp indicator provides several functions:

- **On/Off**—Indicates whether the lamp is on or has been turned off
- **Lifetime**—Displays a warning when the lamp has 25% of its lifetime remaining (this function is available only when the lamp is on)
- **Status**—Press the lamp indicator to see detailed information regarding the lamp

The lamp indicator is a useful tool in determining when the lamp is approaching the end of its lifetime. However, to accurately determine when the lamp requires replacement, you must first obtain additional information (*see "Lamp Warning" on page 182*).

Lamp On/Off

Users at the maintenance and administrator levels can press **Menu → Toggle Lamp** to toggle the lamp on or off (*see "Toggle Lamp" on page 156*). When you use this function, the lamp indicator changes its display accordingly.

Table 3-2 *Lamp on/off indications*

Lamp indicator	Lamp lifetime
	Lamp is toggled on.
	Lamp is toggled off. Note that the indicator is completely gray.

Note that when the lamp is turned on, the lamp indicator displays an approximation of the remaining lifetime of the lamp (see the next section).

Lamp Lifetime

The lamp indicator also displays a warning when the lamp has 25% of its lifetime remaining. Note that the indicator displays this information only when the lamp is turned on.

The following table illustrates the different displays of the lamp indicator and their meaning.

Table 3-3 *Lamp lifetime indications*

Lamp indicator	Lamp lifetime
	Lamp has more than 25% of its lifetime remaining.
	Lamp has 25% or less of its lifetime remaining.

This function lets you plan for replacing the lamp—for example, when the indicator shows that the lamp is nearing the end of its lifetime, you should ensure that you have a replacement lamp nearby or that you have alerted your technical support staff that the lamp will require replacement in the near future.

Lamp Status

You can also use the lamp indicator to see detailed information concerning the lamp.

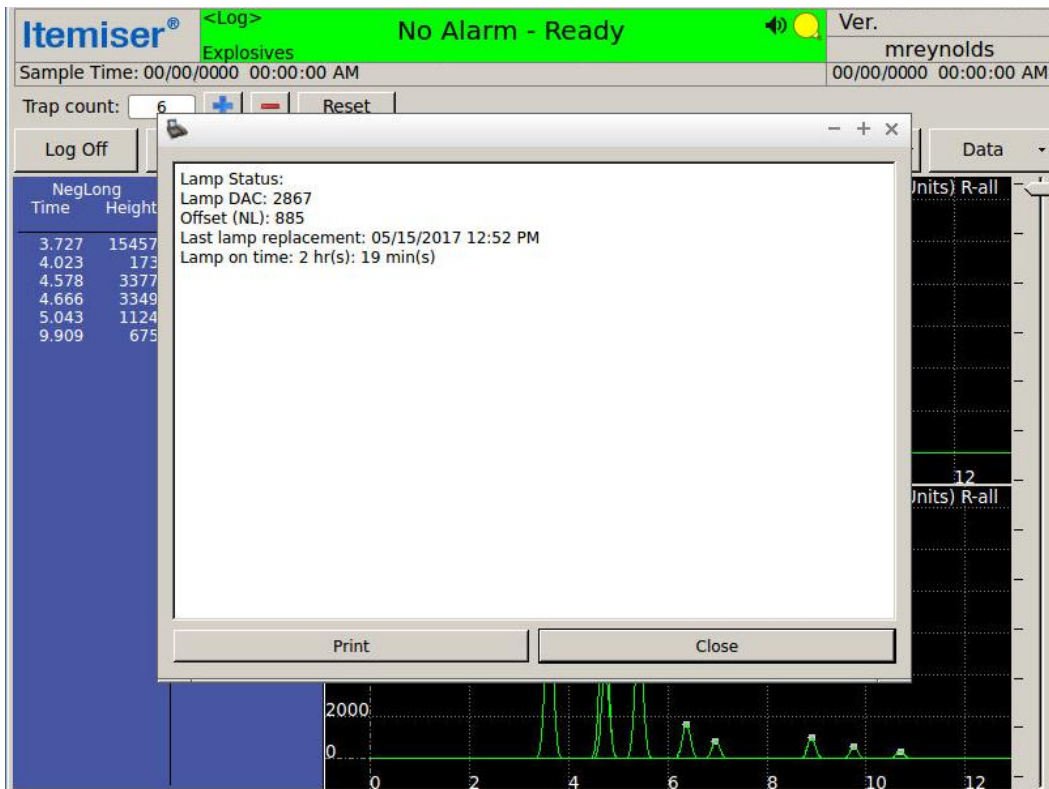


IMPORTANT

Before using the lamp indicator, ensure that the Itemiser® 4DX is in good working order and that the screen is displaying the *No Alarm - Ready* message. If the device is not functioning properly or is displaying a warning message, the lamp indicator might not provide accurate information.

1. Press the lamp indicator.

The screen displays the lamp status window:



2. (Optional) Press **Print** to print a copy of the lamp status information.
3. Press **Close** to close the lamp status window.

The screen displays the main window.

This completes the procedure.

Log Off

Use the **Log Off** button to log off the device. You should always log off when you are no longer using the device or whenever you must leave it unattended.

To log off the device:

1. Resolve any warnings.
2. Press the **Log Off** button.

The screen displays a message that asks if you are certain you want to log off.

3. Press **Yes**.

The device logs you off, and displays the *User Log On...* window.

Shutting Down the Device

Shut down the device only if you need to perform maintenance, or if you do not plan to use it for an extended period of time. The device functions best when it is left powered on—this prevents contamination or water condensation, and eliminates the delay required for the device to warm up to operating temperature.

To shut down the device:

1. Log off the device.
2. Press the **Shutdown** button:



The screen displays *Shutdown Reason Dialog* window.

3. Select the check box that corresponds to the reason you are shutting down the device. Note that you can select more than one check box.
4. Enter a comment or additional information in the fields provided. Entering complete information can assist technical support staff in diagnosing and solving problems.

5. Press **Log Maintenance and Shutdown**:

The screenshot shows a window titled "Shutdown Reason Dialog" with a tab labeled "Item". The window contains three main sections for logging reasons:

- Corrective:**
 - ☐ Lamp replacement: New Lamp Serial Number: [text box]
 - ☐ Hardware/board Replacement Notes: [text box]
 - ☐ Warning Resolution Notes: [text box]
- Preventative:**
 - ☐ Short-Term Maintenance
 - ☐ Long-Term Maintenance
- Other:**
 - ☐ Shipment: Destination: [text box]
 - ☐ Storage: Notes: [text box]
 - ☐ Other: Notes: [text box]

At the bottom of the dialog, there are two buttons: "Log Maintenance and Shutdown" (which is highlighted with a red rectangle) and "Cancel".

6. Wait for the screen to display a blank white window.
7. Press the power button on the rear panel of the device.

The LED on the power button goes out.

This completes the procedure.

Logging On

The Itemiser® 4DX displays the *User Log On* screen each time you start the ITMS software or log off.

To log on:

1. Type your user name in the **User Name** field.
2. Touch the **Password** entry box to highlight it.
3. Type your password.
4. Press **Log On**:

Itemiser® <Log> User Log On... Ver.

Sample Time: 00/00/0000 00:00:00 AM 00/00/0000 00:00:00 AM

User Name: mreynolds

Password: *****

1 2 3 4 5 6 7 8 9 0

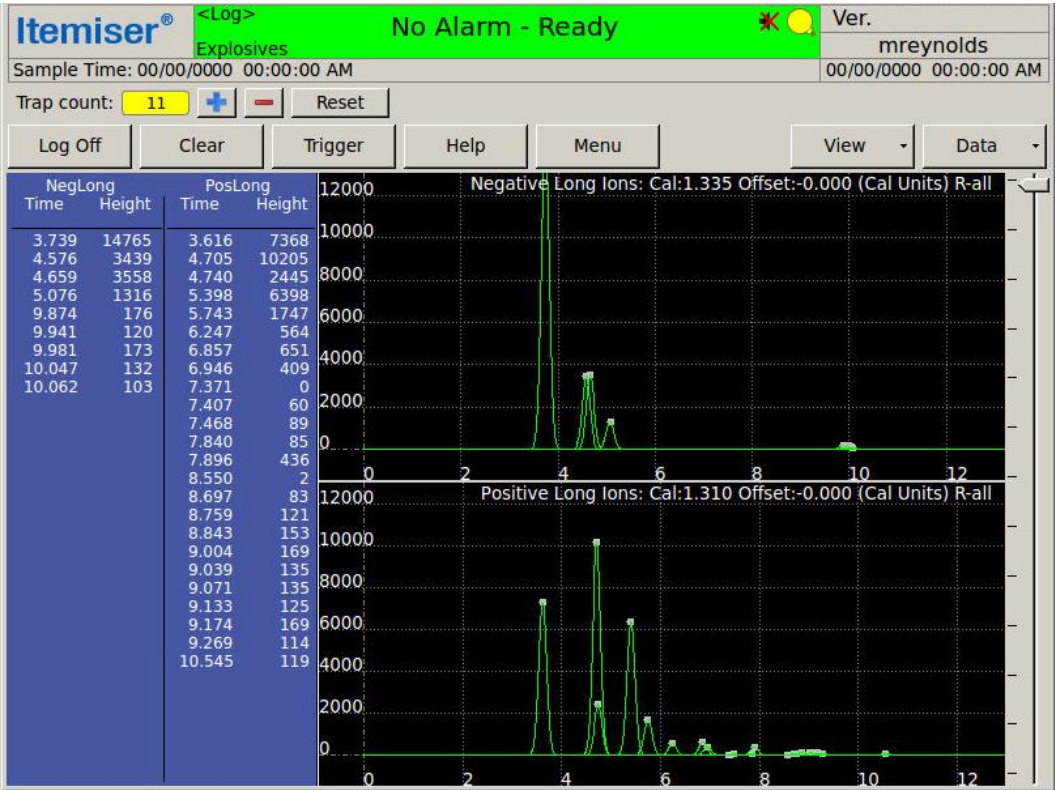
q w e r t y u i o p

a s d f g h j k l Back

Shift z x c v b n m Log On

Shutdown

The screen displays the *No Alarm - Ready* message:



Note that the *No Alarm - Ready* message might be different, depending on your user level or device settings (see ["View" on page 53](#)).

The device is now ready for operation.

Note that if the screen displays a warning message instead, you must resolve it before you can begin using the device (see ["Introduction to Warnings" on page 174](#)).

This completes the procedure.

Failed Log-On Attempts

If you try to log on to the device and fail three times in succession, the device locks out all your log-on attempts for 60 minutes (other users can log in anytime).

The device also logs all failed attempts into the **History** files for tracking purposes.

Warm-Up Time

The normal operating temperature of the Itemiser® 4DX is approximately 200°C. Of course, when you turn off power to the device, it begins cooling down, eventually reaching room temperature.

When you turn power to the Itemiser® 4DX back on, it must warm up to its operating temperature before it is ready for use. If the device has been powered off for an extended period, it may also have to burn off any contaminants inside the detection system. This process can take anywhere from 5 minutes to almost 24 hours, depending on how long the device has been powered off. Refer to the *Warm-Up Time* table for specific information.

Whenever you turn on power to the device and log on, the software displays the *Stabilizing* message, along with a timer. The timer shows how much time the device needs to reach its operating temperature.



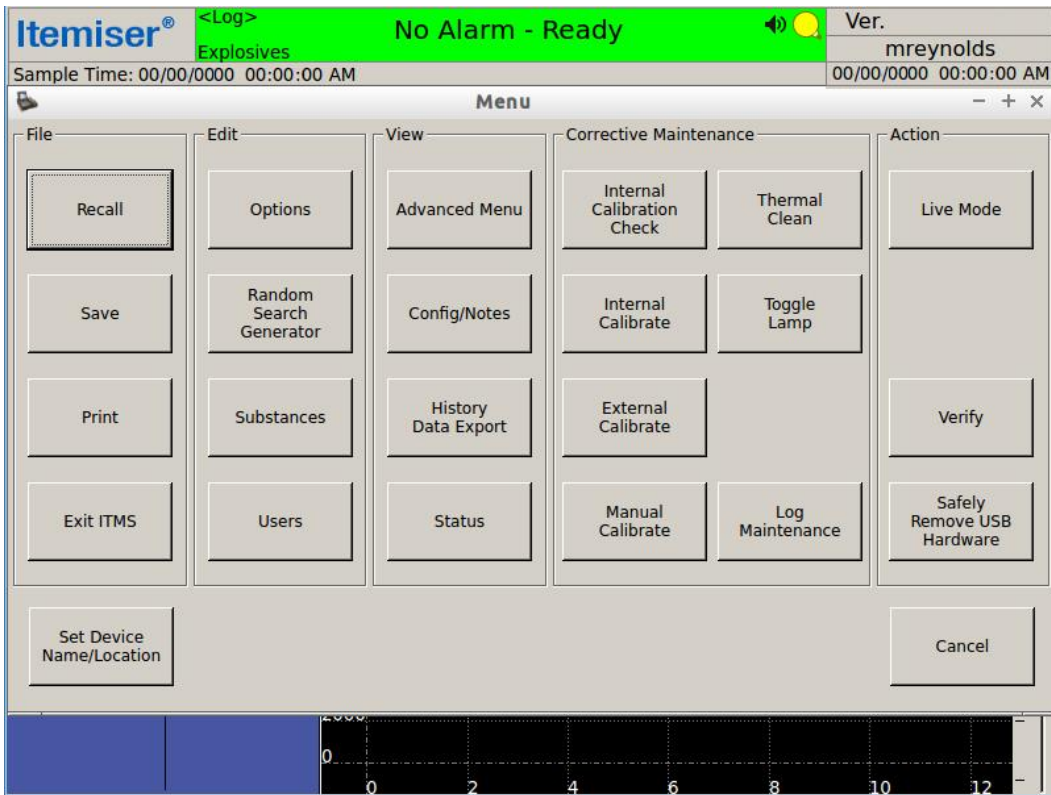
Table 3-4 Warm up time

Time Device Powered Off	Warm-Up Time
72 hours or more	When you power on the device and log on, it displays the <i>Stabilizing</i> message with the timer set to 23:55:00. When the device displays the <i>No Alarm - Ready</i> message, you can begin using it. NOTE: A maintenance-level user must perform a thermal clean cycle of 23:55 before the device is ready for operation (see "<i>Thermal Clean</i>" on page 154).
Between 24 and 72 hours	When you power on the device and log on, it displays the <i>Stabilizing</i> message with the timer set to 02:55:00. When the device displays the <i>No Alarm - Ready</i> message, you can begin using it. NOTE: A maintenance-level user must perform a thermal clean cycle of 2:55 before the device is ready for operation (see "<i>Thermal Clean</i>" on page 154).
Between 15 minutes and 24 hours	When you power on the device and log on, it displays the <i>Stabilizing</i> message with the timer set to 00:27:00. When the device displays the <i>No Alarm - Ready</i> message, it is ready for operation.
Less than 15 minutes	When you power on the device and log on, it displays the <i>Stabilizing</i> message with the timer set to 00:05:00 (or less). When the device displays the <i>No Alarm - Ready</i> message, it is ready for operation.

Note that the device provides the best service when left powered on continuously. This maintains the detector and desorber at their operating temperature, preventing contamination and condensation of water vapor in the device. It also eliminates the need to wait for the device to warm up.

Menu

To view the menu functions, press the **Menu** button. The screen displays the *Menu* window:



Your user level determines which buttons are accessible to you. If a button is grayed out, this indicates that your user level does not include permission for you to perform that function.

Sound Indicator

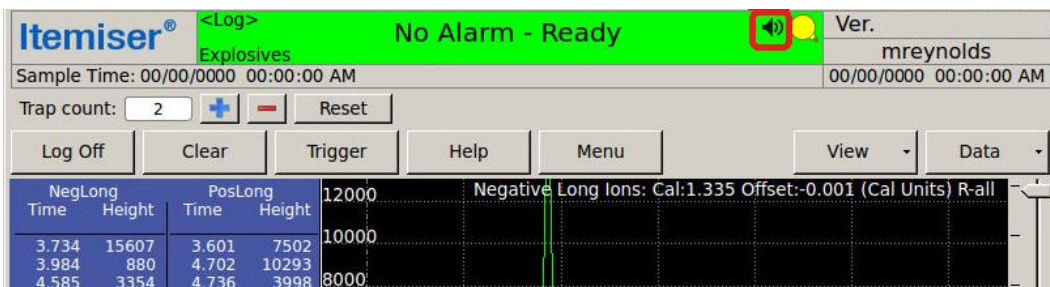
The sound indicator displays the status of the Itemiser® 4DX speaker. It also allows you to control the audio function.

You can specify when the device produces sounds:

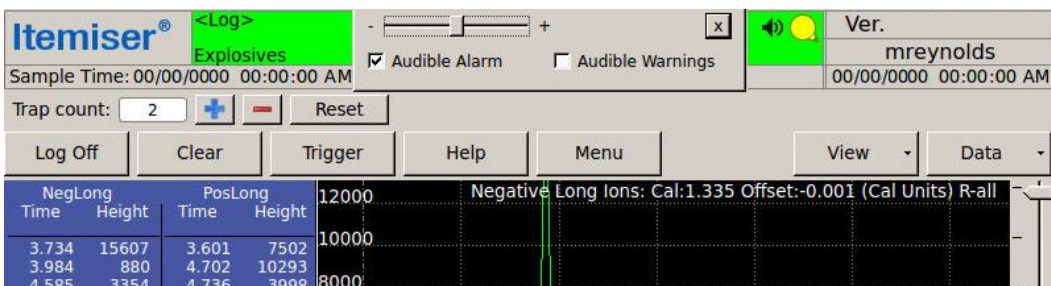
- **Alarm**—Whenever the device detects a prohibited substance
- **Warning**—Whenever the device displays a warning message
- **Both** alarm and warning
- **Neither** (sound muted)

When the sound is activated, the device sounds three beeps. You can control the level of the sound:

1. Press the speaker symbol:



The screen displays a small sound window:



2. To direct the device to sound an audible alarm whenever it detects a prohibited substance, select the **Audible Alarm** check box:



3. To direct the device to sound an audible alarm whenever it detects a fault or displays a warning, select the **Audible Warnings** check box;

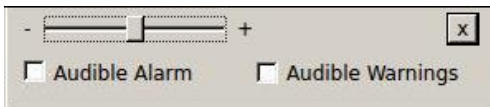


Note that you can select both **Audible Alarm** and **Audible Warnings**.

4. To change the volume (sound level), move the slider bar to the left (toward the minus sign) for quieter beeps or to the right (toward the plus sign) for louder beeps:

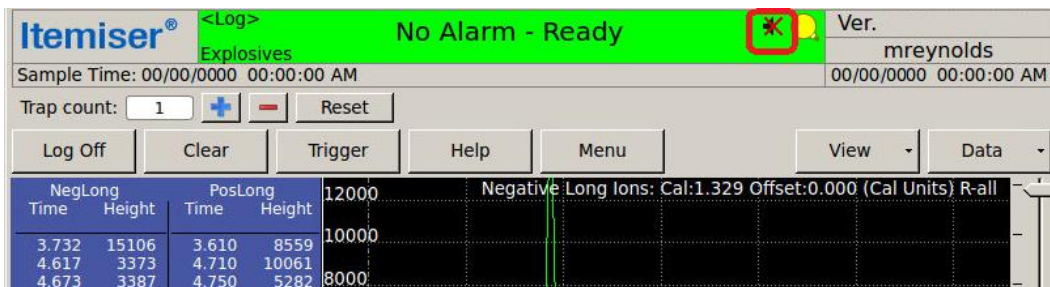


5. To mute the sound, clear both the **Audible Alarm** and **Audible Warnings** check boxes:



When you make a selection, the system closes the sound window and displays the main window.

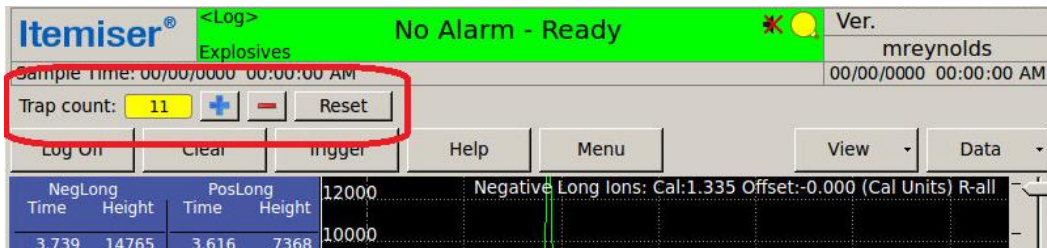
When you mute the sound the status bar displays an X over the speaker symbol:



You can also control the device sound from Page 3 of the *Options* menu (see "*Options* " on page 120). This completes the procedure.

Trap Counter

The trap counter automatically keeps track of the number of traps inserted into the device; it typically functions as a reminder of the number of times you have used a sample trap:



Each time you insert a trap into the desorber slot, the counter increases the number displayed by 1.

You can also change the number manually:

- Press the plus sign (+) to add 1 to the count.
- Press the minus sign (-) to subtract 1 from the count.
- Press the **Reset** button to rest the count to 0.

Always follow your organization's guidelines on how many times to use a sample trap.

You can use a sample trap at least 20 times. Do not use a sample trap if it has caused an alarm, or is visibly dirty, torn, wet, or damaged ([see "Sample, Calibration, and Verification Traps" on page 6](#)).

The trap counter feature is enabled by default. Users at the maintenance and administrator levels can change this setting using the *Options* function ([see "Options " on page 120](#)).

Trigger

Press **Trigger** to initiate a sampling sequence without having to insert a trap into the desorber slot. This ability is helpful during diagnostic and maintenance procedures.

Only users at the maintenance and administrator levels have access to this function.

When you press **Trigger**, the screen displays the *Sampling* message for approximately 8 seconds. It then displays the *No Alarm - Ready* message. The device is now ready for operation.

View

Press the **View** button to change the main display to another view of the detector data.

The ITMS software includes four different views for displaying data:

- List view
- Plasmagram
- Intensity map
- 3-D

If you are an operator-level user, you can see only the list view.

If you are a supervisor-level user, you can see the list view and the plasmagram view.

If you are a maintenance- or administrator-level user, you can see all views.

List View

The List view displays all substances that are selected for detection in a bar graph layout. These substances are from the custom library of substances ([see "Substances" on page 146](#)).

This view requires no interpretation, and is the only view accessible to operator-level users. Users of all other levels also have access to the list view.

To see the list view:

1. Press **View**.

The screen displays a list of the accessible views.

2. Press **List View**.

The screen displays the list view.

Itemiser®		<Log>		No Alarm - Ready		Ver.	
		Explosives				mreynolds	
Sample Time: 00/00/0000 00:00:00 AM				00/00/0000 00:00:00 AM			
Trap count: 0		+		-		Reset	
Log Off		Clear		Trigger		Help	
				Menu		View ▾	
						Data ▾	
E1						OK	
E2/E3						OK	
E4						OK	
E5						OK	
E6						OK	
E7						OK	
E8						OK	
E9/E1						OK	
E3/E2						OK	

When the device detects a substance and enters the alarm condition, it displays a red bar across the substance code along with the word *Detected*.

Itemiser®

<Log>

Explosives Detected



Ver.

Explosives

mreynolds

Sample Time: 00/00/0000 00:00:00 AM

File: ALM00039.sca

00/00/0000 00:00:00 AM

Trap count: 1





Reset

Log Off

Clear

Trigger

Help

Menu

View

Data

E1	OK
E2/E3	OK
E4	OK
E5	OK
E6	OK
E7	OK
E8	OK
E9/E1	Detected
E3/E2	OK

This completes the procedure.

Plasmagram View

The plasmagram view displays spectrum data about an analysis.

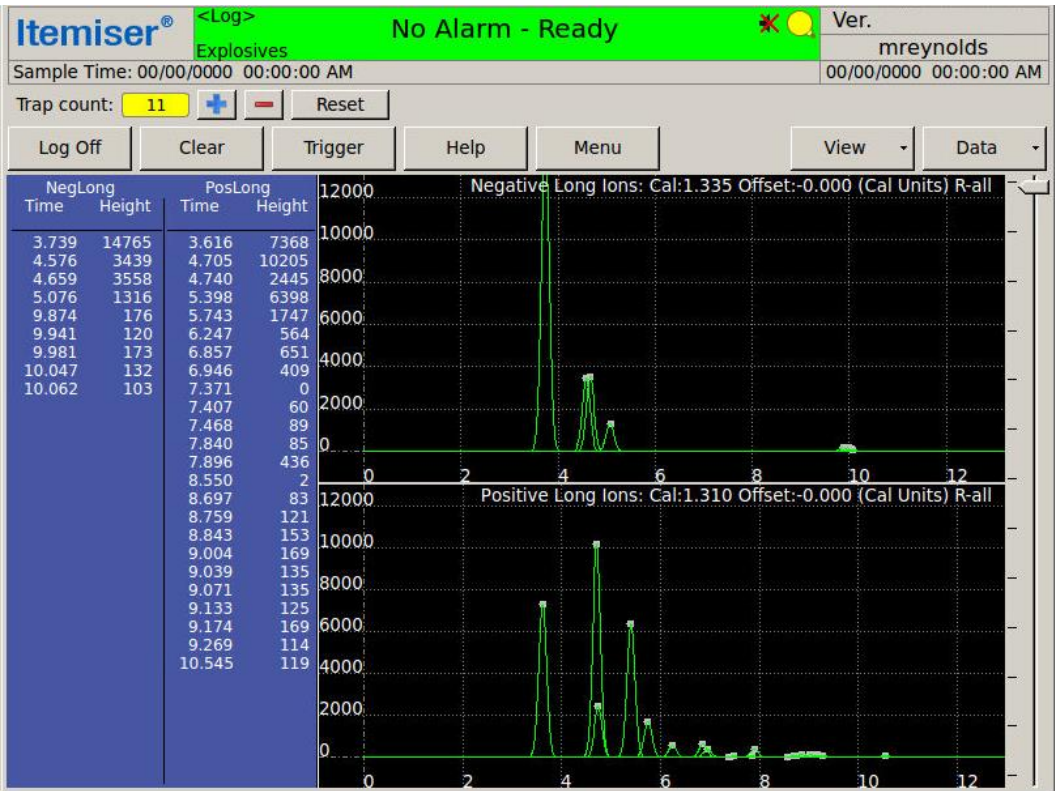
The x-axis is the drift time in milliseconds, and the y-axis is the intensity in arbitrary units.

The plasmagram view displays a list of all the peaks found, and their numeric value, in the left column of the view.

The plasmagram view is accessible only to supervisor-, maintenance-, and administrator-level users (it is the default view for these users).

To see the plasmagram view:

1. Press **View**.
The screen displays a menu listing the views available.
2. Press **Plasmagram**.
The screen displays the plasmagram view.



The plasmagram view displays the peaks found list in the left (blue) column. The list displays the *Time* and *Height* data for all peaks, and separates the list between negative and positive Ion data.

3. To view additional negative and positive ion data, press the **Data** button.
The screen displays a list of available views.

4. Select the data view you want:

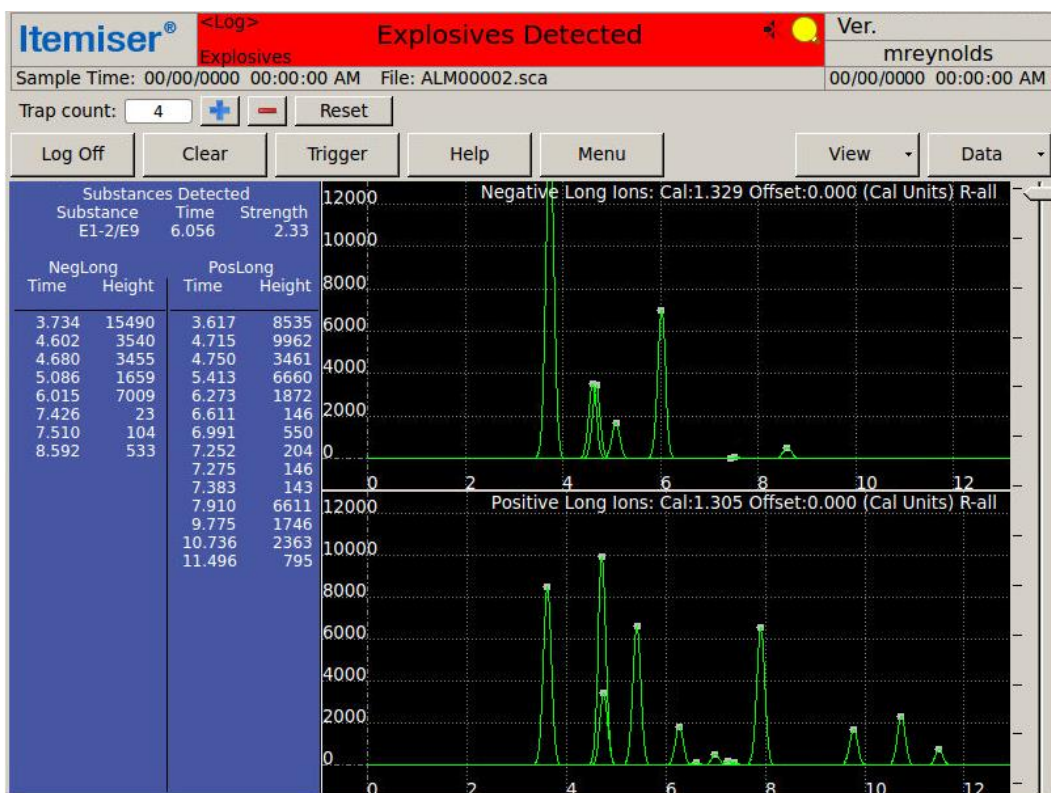


When the device generates an alarm, the screen displays a *Substances Detected* list at the top of the *Peaks Found List*. The list displays the substance code or name along with the *Time* and *Strength* of the peaks. The *Strength* value is a multiple of the alarm level as calculated by the software; it does not necessarily indicate the quantity of the substance detected.

- To see additional information on any peak, touch the top of the peak.

The screen displays a red dot and highlights the *Time* and *Height* of the peak in red in the *Peaks Found List*.

The plasmagram also highlights the detected substance peak with a yellow line and displays the substance code or name with its *Time* in either the negative ion or positive ion windows.



This completes the procedure.

Intensity Map View

The intensity map view displays, in one view, all plasmagrams that were collected during a sample event.

The software stacks all plasmagrams on end, showing their height as intensity. Consequently, the wider white areas on the *Intensity Map* screen represent a sequence of peaks, and dark areas represent troughs. Vertical lines represent a sequence of peaks that can be used to identify a substance.

Press the line of a peak to see details about the measurement such as mean time, maximum and minimum height, and slope.

The intensity map view is accessible only to maintenance- and administrator-level users.

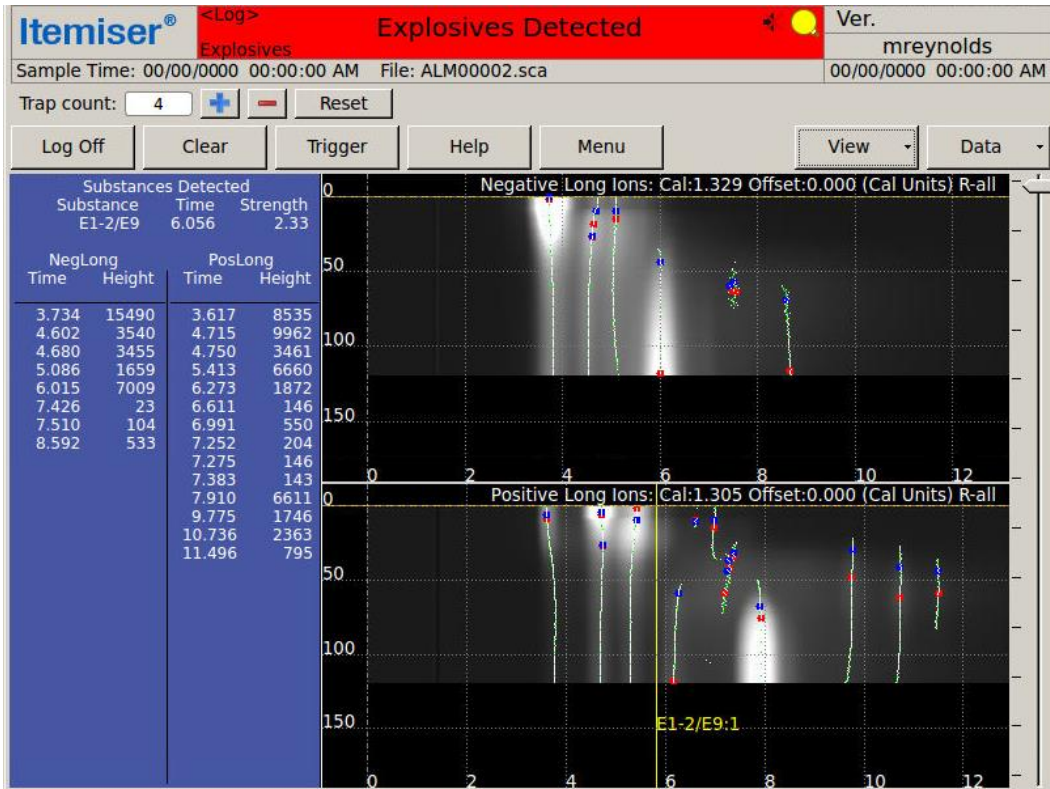
To view the intensity map:

- Press **View**.

The screen displays a list of the views available.

2. Press **Intensity Map**.

The screen displays the intensity map view.



This completes the procedure.

3-D View

Use the 3-D view to view all plasmagram data and rotate it in three dimensions.

Drag on the screen with a finger to rotate the image; this shows you what the plasmagram looked like over a period of time. The green line represents the sequence of peaks detected during the default 120 scans.

The 3-D view is accessible only to maintenance- and administrator-level users.

To see the 3-D view:

1. Press **View**.

The screen displays a list of the views available.

2. Press **3-D**.

The screen displays the 3-D view.

3. To scroll through the plasmagrams, drag the arrow to the right of the plasmagram view up and down.

As you scroll through the data, the yellow line moves through the various scans.



This completes the procedure.

View and Copy Options

The plasmagram view includes a number of view and copy options:

1. Press and hold your finger on the plasmagram.
The screen displays a list of the view and copy options.
2. Press the option you want:

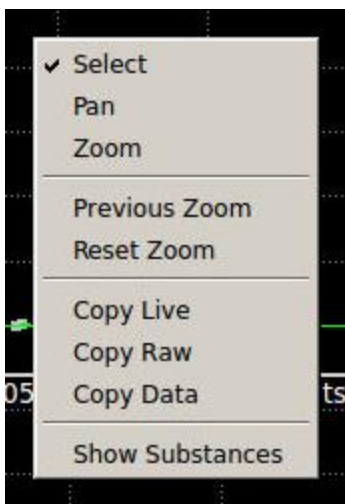
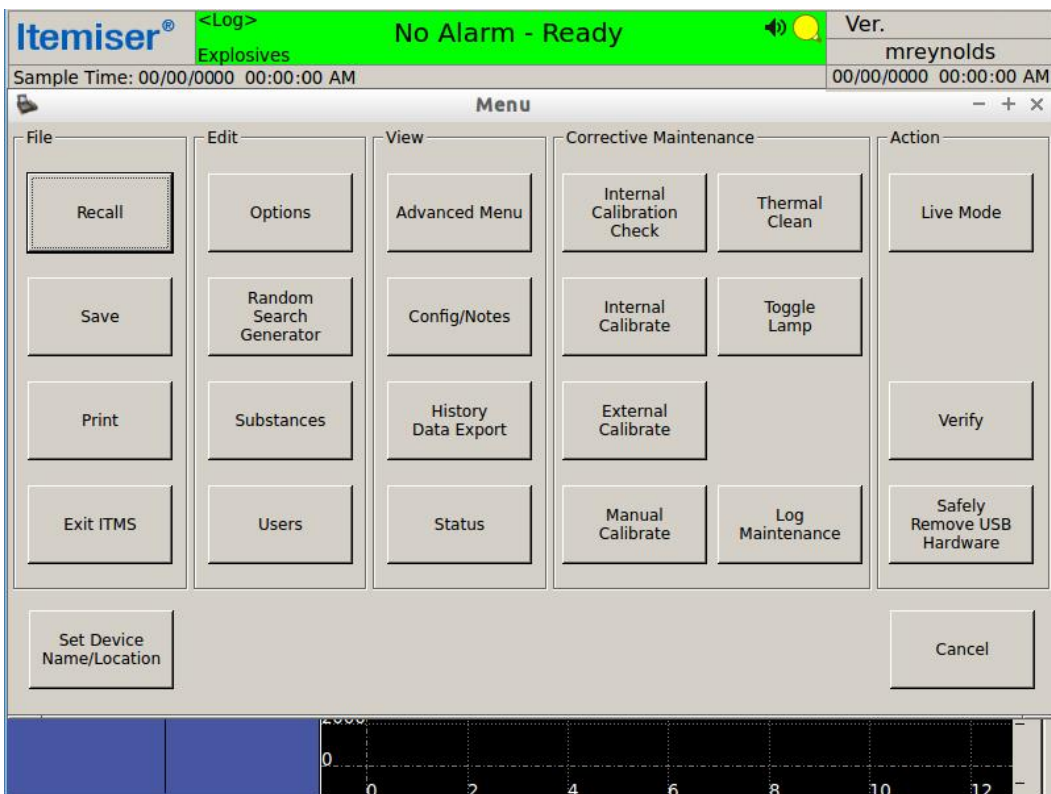


Table 3-5 *View and Copy Descriptions*

Function	Description
Select	Touch a peak on the plasmagram and view the time (in milliseconds) for the peak. This also displays the time and height (in red) in the peaks found list.
Pan	Drag a finger across the screen to move (pan) the plasmagram. Note that the axis labels change.
Zoom	Use Zoom to draw a box around a specific peak on the plasmagram and enlarge the spectrum of the plasmagram display. This increased resolution at the lower portion of the display provides a better view of small peaks that might otherwise go unnoticed.
Previous Zoom	Displays the previous view.
Reset Zoom	Resets the plasmagram to the default view (no zoom).
Copy Live	Copies the live data to the clipboard for pasting into another application.
Copy Raw	Copies the raw data to the clipboard for pasting into another application.
Copy Data	Copies the data to the clipboard for pasting into another application.
Show Substances	Displays grey lines on the plasmagram to indicate the location of the substances selected for detection.

Menu Functions

The *Menu* window contains buttons that provide access to additional Itemiser® 4DX software functions.



Your user level determines which buttons are accessible to you. If a button is grayed out, this indicates that your user level does not include permission for you to perform that function.

Adjust Date & Time

Use the **Adjust Date & Time** button to adjust the date and time internal to the device:

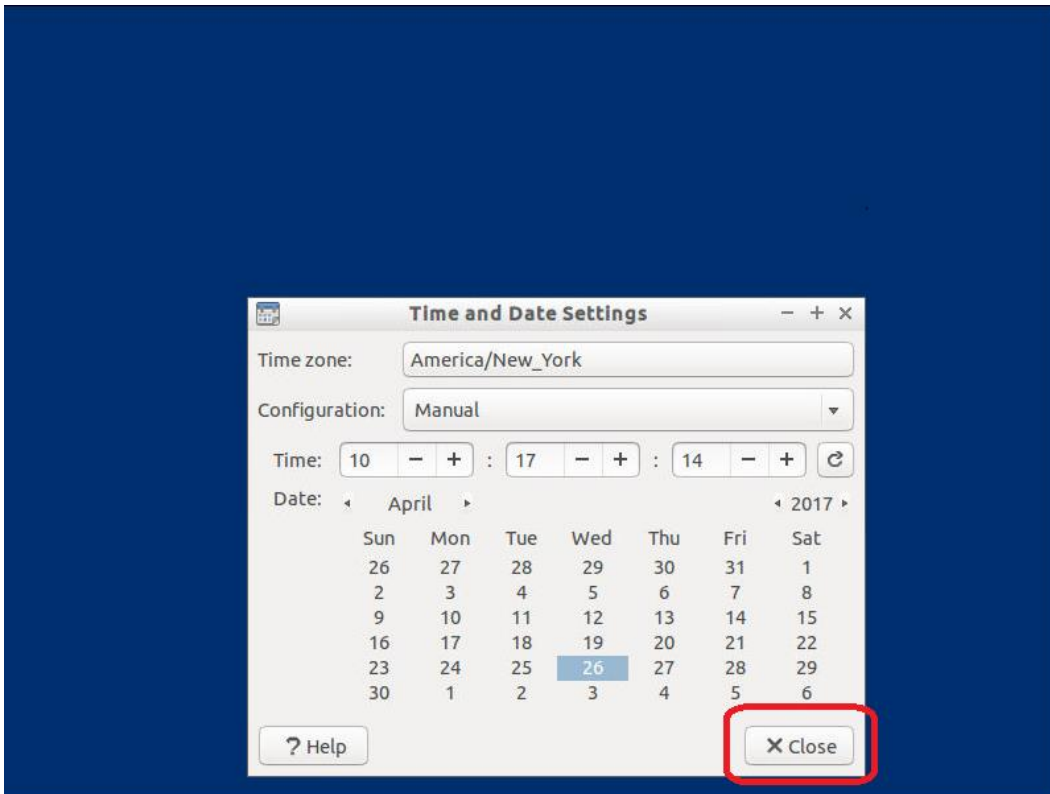
1. Press **Menu** → **Advanced Menu**.
2. Press **Adjust Date & Time**.

Your screen displays a message that notifies you that adjusting the date and time requires the ITMS software to restart and the operating system to shut down.

3. Press **Yes**.

Your screen displays the *Time and Date Settings* window.

4. Adjust the date and time as necessary.

5. Press **Close**:

The device changes the date and time, and then restarts the ITMS software.

The device displays the log-on screen.

This completes the procedure.

Advanced Menu

The *Advanced Menu* displays additional system functions and information.

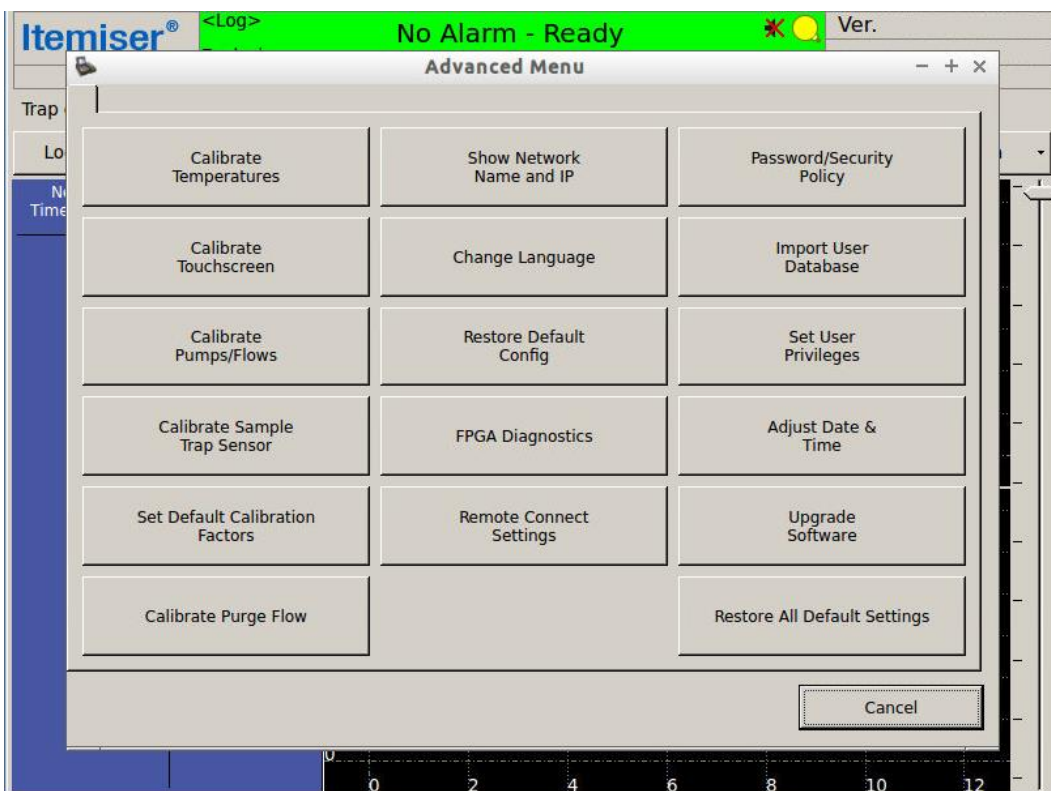
Only maintenance- and administrator-level users have access to the *Advanced Menu* window. Administrator-level users have access to all functions on the *Advanced Menu* window, while maintenance-level users do not (if a button is grayed out, this indicates that your user level does not include permission for you to perform that function).

A keyboard is required to perform many of the functions on the *Advanced Menu*.

To view the *Advanced Menu*:

1. Press **Menu** → **Advanced Menu**.

The screen displays the *Advanced Menu* window.



2. To close the advanced menu, press **Cancel**.

Table 3-6 *Advanced Menu*

Function	Description
Adjust Date & Time	Sets the device date and time (see "Adjust Date & Time" on page 62).
Calibrate Pumps/Flows	Calibrates the detector, dopant, and sample flows. You typically perform this if the flows have been adjusted and need to be set. Never perform this function simply to resolve a sample or detector flow warning. Without a full understanding of what you are changing, you might mask another issue and eventually render the device inoperable (see "Calibrating Pumps and Flows" on page 1).
Calibrate Purge Flow	Sets the windows for monitoring the on/off flow values. Perform this advanced function only under the supervision of Rapiscan Systems technical support (see "Calibrate Purge Flow" on page 81).
Calibrate Temperatures	Sets the desorber and detector offset so the device can accurately predict when it is at the correct temperature. Never perform this function simply to resolve a stabilizing temperature warning. Without a full understanding of what you are changing, you might mask another issue and eventually render the device inoperable (see "Calibrate Temperatures" on page 82).
Calibrate Touchscreen	Calibrates the x- and y-axes on the touchscreen (see "Calibrate Touchscreen" on page 82).
Calibrate Sample Trap Sensor	Calibrates the desorber sensor (the sensor that detects when a sample trap is inserted) (see "Calibrate Sample Trap Sensor" on page 81).
Cancel	Closes the <i>Advanced Menu</i> widow.
Change Language	Changes the language that the device uses to display all information and functions. Please note that not all functions may appear in the local language selected, due to operating system restrictions (see "Change Language" on page 84).
FPGA Diagnostics	Sets the internal hardware levels for the device. Contact Rapiscan Systems Technical Support before adjusting any settings (see "FPGA Diagnostics" on page 91).
Import User Database	Imports a user database from an external spreadsheet (see "Importing a User Database" on page 1).
Password/Security Policy	Sets the requirements for passwords, password complexity, user names, and account locks, and enables the auto log-off feature (see "Password/Security Policy" on page 126).
Remote Connect Settings	This feature is used with the optional Remote Connect Console (RCC) feature. RCC lets users monitor and control Itemiser® 4DX devices, regardless of location, from any networked personal computer. Refer to the <i>Remote Connect Console V2</i> user manual (MA100070) for installation and use instructions (see "Remote Connect Settings" on page 135).
Restore All Default Settings	Restores the device settings to their factory defaults (see "Restore All Default Settings" on page 136).

Function	Description
Restore Default Config	Restores the substance configuration to the default for the current software version, and allows the user to select an alternate configuration (see "Restore Default Config" on page 136).
Set Default Calibration Factors	Sets the location of the white window that appears while performing manual calibration during the peak selection process (see "Set Default Calibration Factors" on page 139).
Set User Privileges	Sets the privileges and permissions for each user level (see "User-Level Privileges" on page 160).
Show Network Name and IP	Displays a message with the host name and IP address (see "Show Network Name and IP" on page 142).
Upgrade Software	Upgrades the ITMS software (see "Upgrade Software" on page 157).

Calibrate Pumps and Flows



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

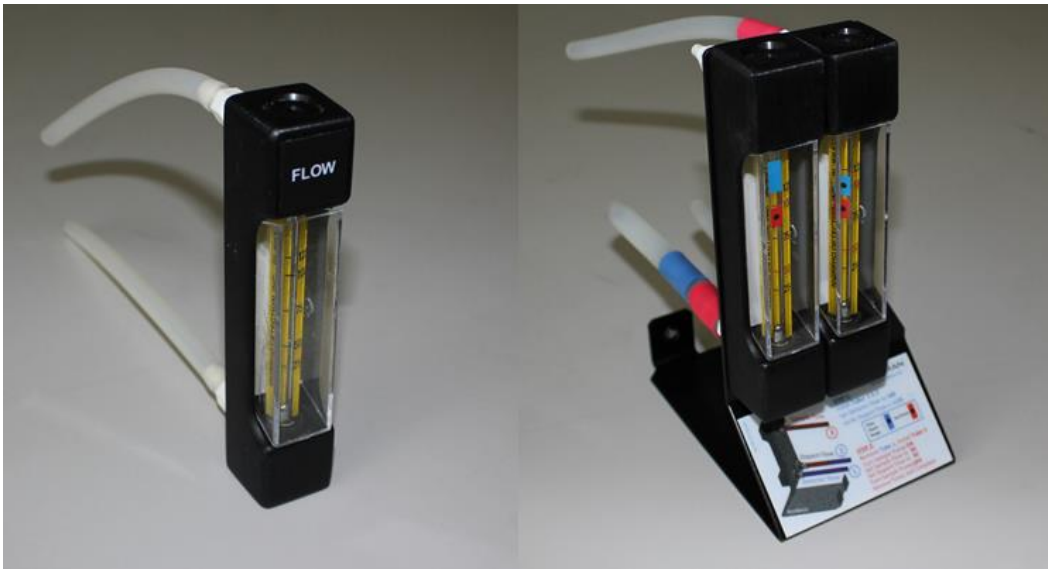
If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

Contact Rapiscan Systems technical support for assistance.

The procedure for calibrating pumps and flows differs, depending on which flow meter you are using:

Figure 3-1 *Flow meters (single flow meter on left, optional dual flow meter on right)*



The following sections describe the procedure for each of the two flow meters.

Calibrate Pumps and Flows—Dual Flow Meter

To calibrate pumps and flows using the dual flow meter:

1. Press **Menu** → **Advanced Menu**.
2. Press **Calibrate Pumps/Flows**.

The screen displays the *Pump Flow Check/Calibration* window.

3. Open the front panel door.



WARNING

When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

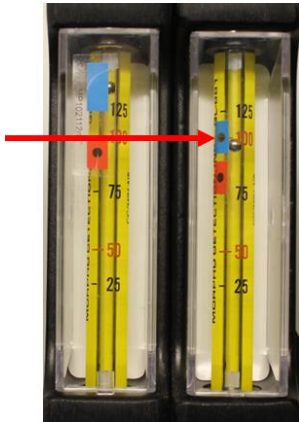
4. Grasp the lower portion of the desorber. Do not touch the upper portion of the desorber (it is very hot).
5. Gently pull the desorber straight out of the device:
6. Place the desorber on a clean surface.
7. Install the flow meter; place the two holes in the flow meter bracket over the two desorber pins, as shown here:



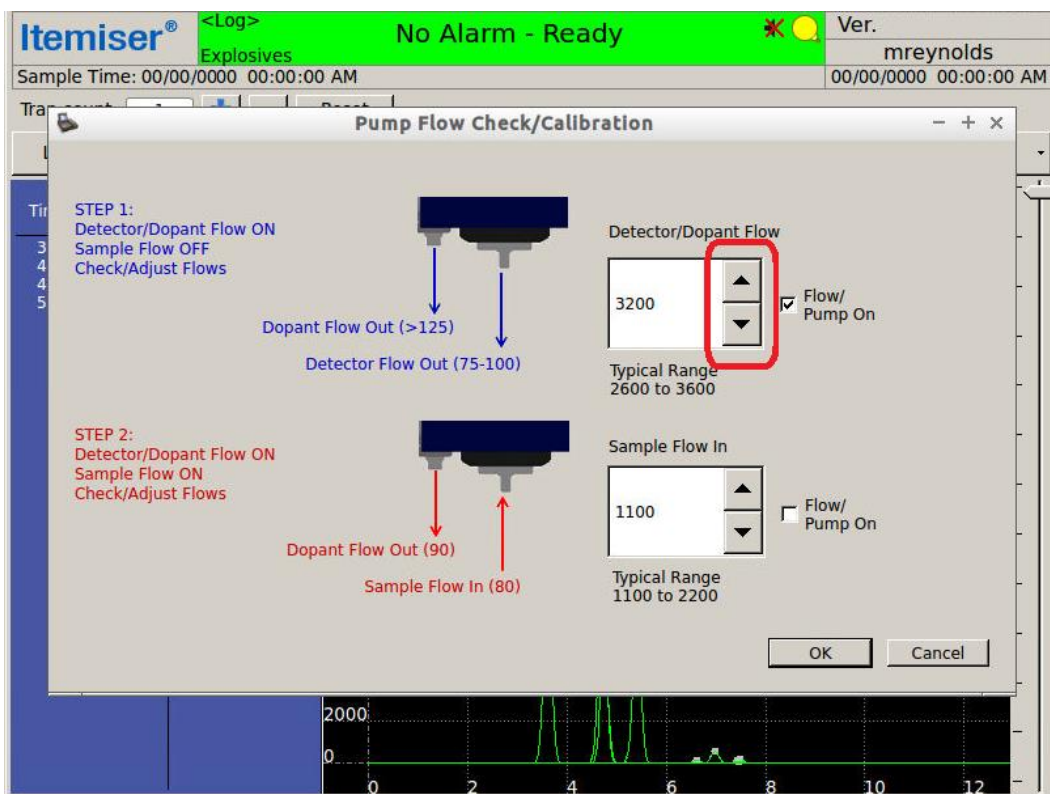
8. Ensure that you securely fit the two bottom tubes onto the device:
 - Install the tube marked with red and blue onto the dopant fitting.
 - Install the tube marked with blue onto the nozzle.

Leave the upper tube (the one marked with red) unconnected.

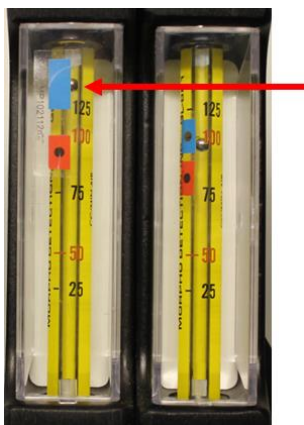
9. Verify that the flow meter shows that the detector flow is 100 cc/min (the right-hand indicator must be in the blue area):



10. If the flow meter does not read 100 cc/min, adjust the **Detector/Dopant Flow** value up or down as needed to reach the 100 cc/min value. To do this, press the up- and down-arrows:



11. Observe the left-hand indicator of the flow meter:

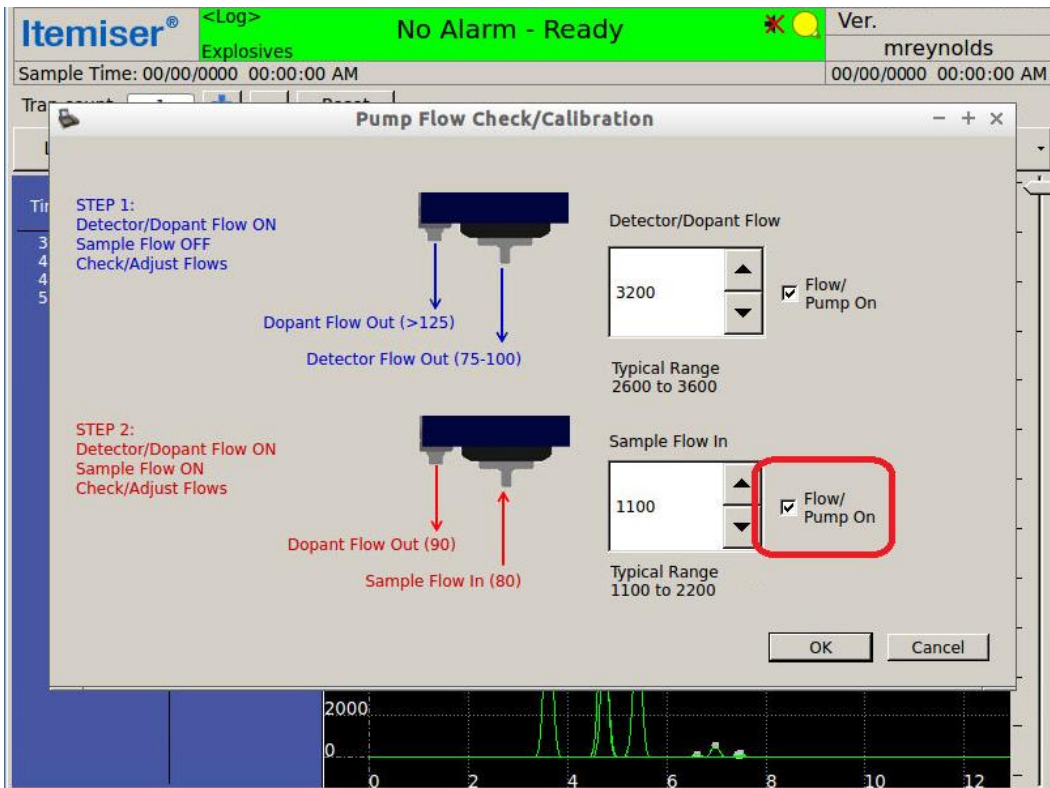


- If the dopant flow is greater than 125 cc/min (the indicator is in the blue area), then continue with this procedure.
- If the flow is not greater than 125 cc/min, the device is improperly calibrated or is malfunctioning. Do not continue with this procedure; contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

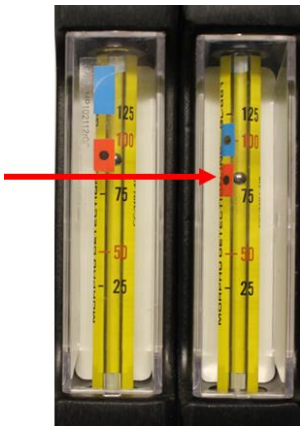
12. Remove the bottom tube of the flow meter (the tube marked in blue) from the nozzle.

13. Connect the top tube of the flow meter (the tube marked in red) to the nozzle.

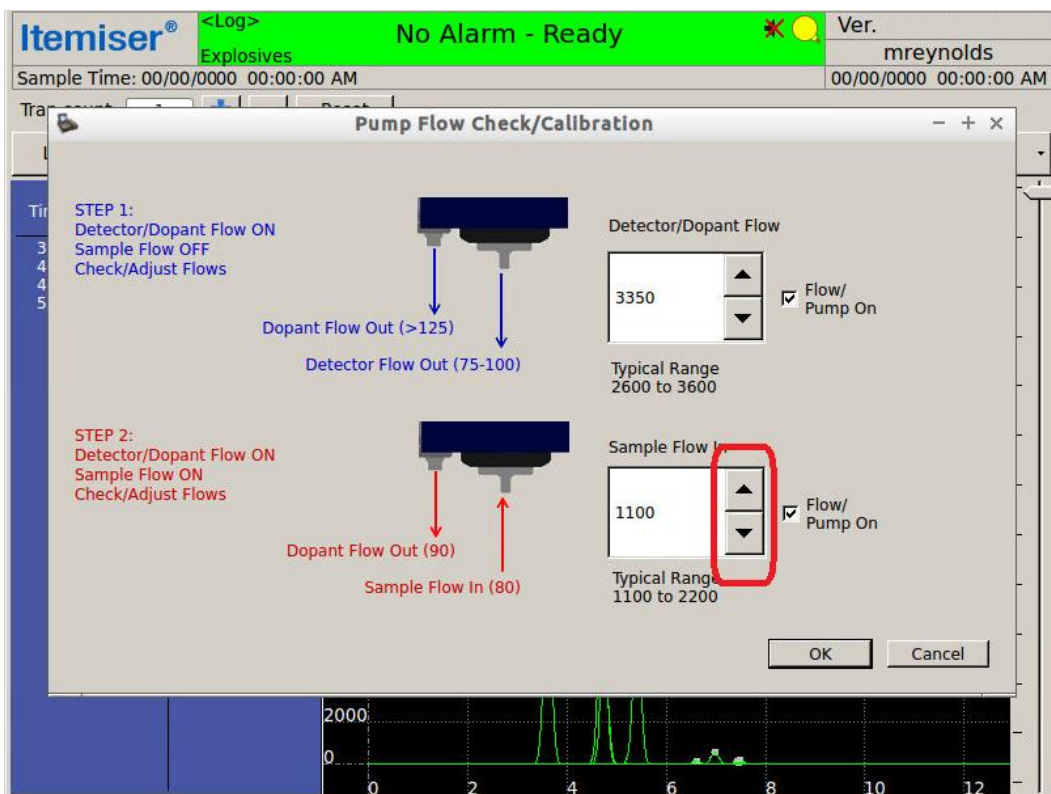
14. Check the **Flow/Pump On** check box for the sample flow:



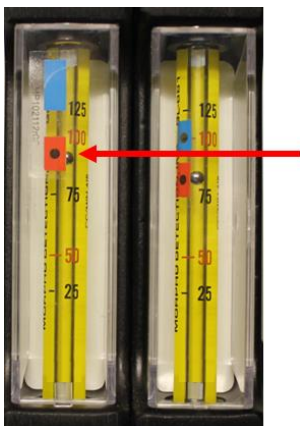
15. Verify that the flow meter shows that the sample flow is approximately 80 cc/min. The right-hand indicator must be in the red area:



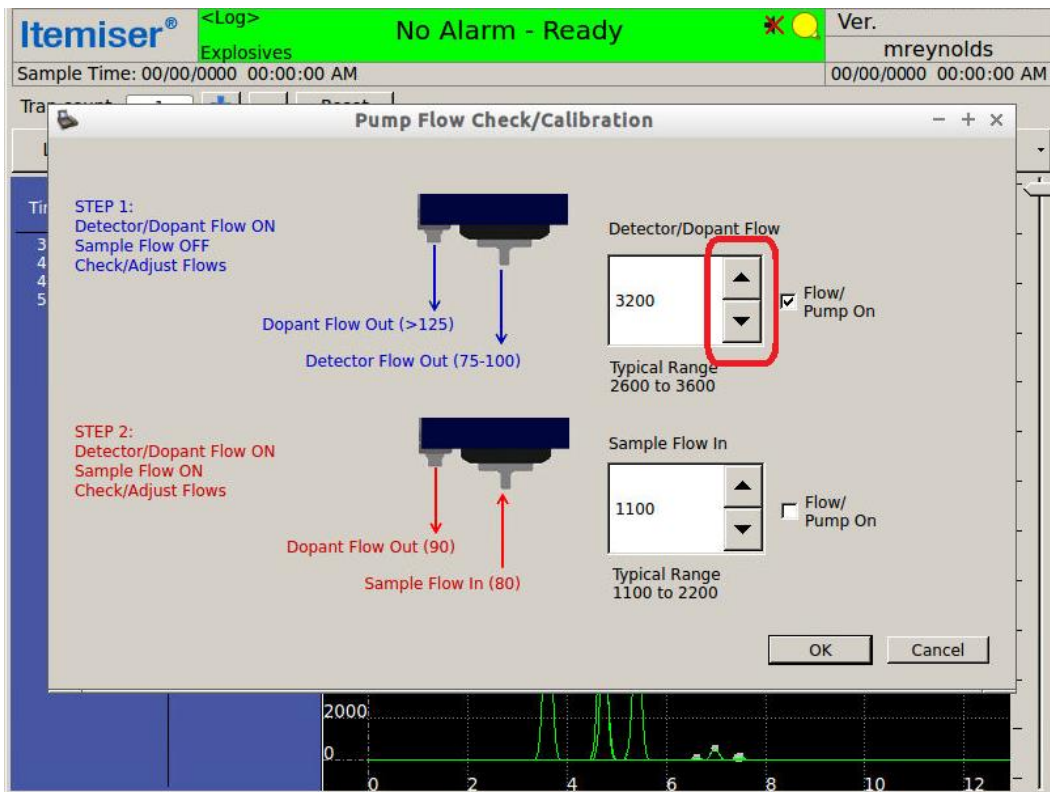
16. If the flow meter does not read approximately 80 cc/min, adjust the **Sample Flow In** value up or down as needed to reach the 80 cc/min value. To do this, press the up- and down-arrows:



17. Verify that the left-hand indicator of the flow meter is indicating 90 cc/min (the indicator is in the red area):

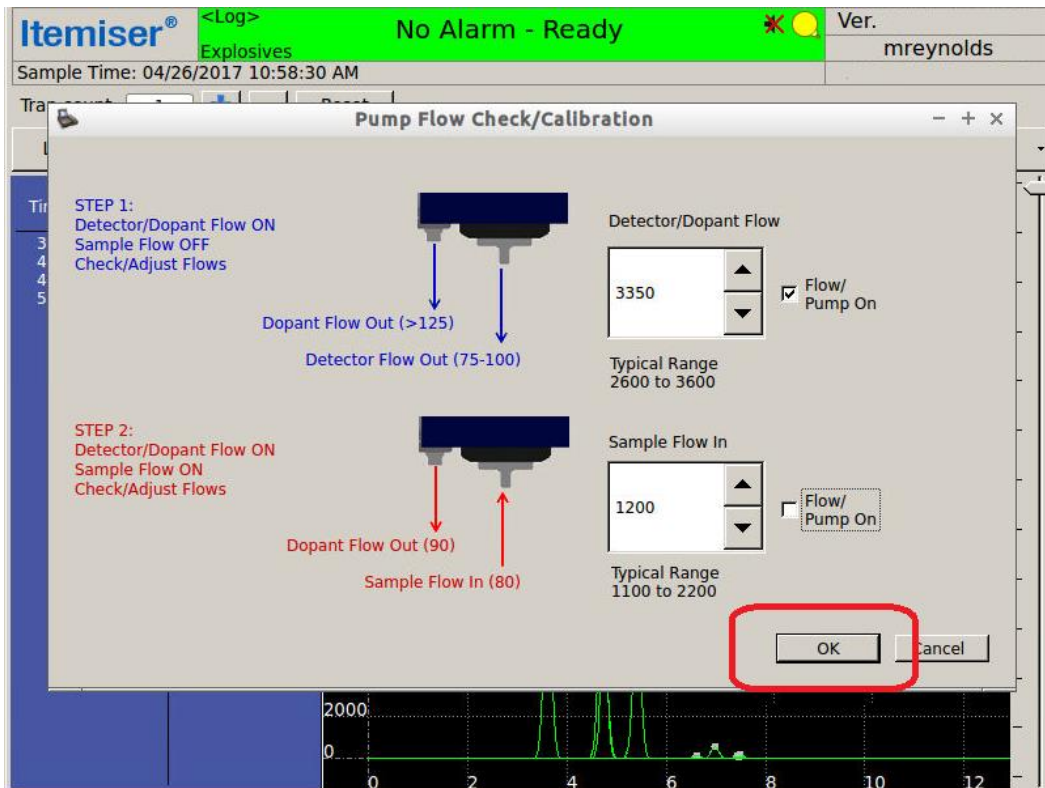


18. If the flow meter does not read 90 cc/min, adjust the **Detector/Dopant Flow** value up or down as needed to reach the 90 cc/min value. To do this, press the up- and down-arrows:



19. Uncheck the *Sample Flow In Flow/Pump On* box.
20. Disconnect the flow meter from the device.

21. Press **OK**:



The screen displays the *Pump calibration saved* message.

22. Press **OK**.

The screen displays a message asking if you want to calibrate the flows.

23. Install the desorber.

24. Wait until the screen displays the *No Alarm-Ready* message.

25. Press **Yes**.

The screen displays a reminder message that warns you not to proceed until you have re-installed the desorber and waited until the screen displays the *No Alarm-Ready* message.

26. Verify that you have re-installed the desorber and that the screen is displaying the *No Alarm-Ready* message.

27. Press **OK**.

Your screen displays the *Measuring* message.

28. Wait until the screen displays the *No Alarm-Ready* message, and a message that lists the pump calibration values.

29. Press **OK**.

The screen displays the main window.

This completes the procedure.

Calibrate Pumps and Flows—Single Flow Meter

To calibrate pumps and flows using the single flow meter:

1. Press **Menu** → **Advanced Menu**.
2. Press **Calibrate Pumps/Flows**.

The screen displays the *Pump Flow Check/Calibration* window.

3. Open the front panel door.

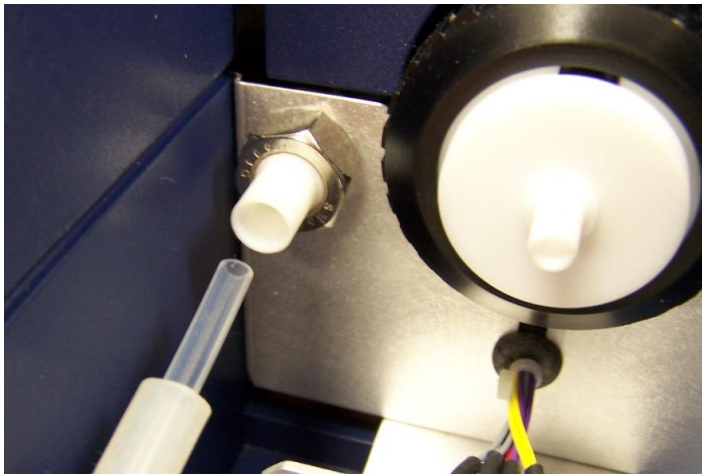


WARNING

When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

4. Grasp the lower portion of the desorber. Do not touch the upper portion of the desorber (it is very hot).
5. Gently pull the desorber straight out of the device:
6. Place the desorber on a clean surface.
7. Connect the bottom tube of the external flow meter to the dopant fitting:



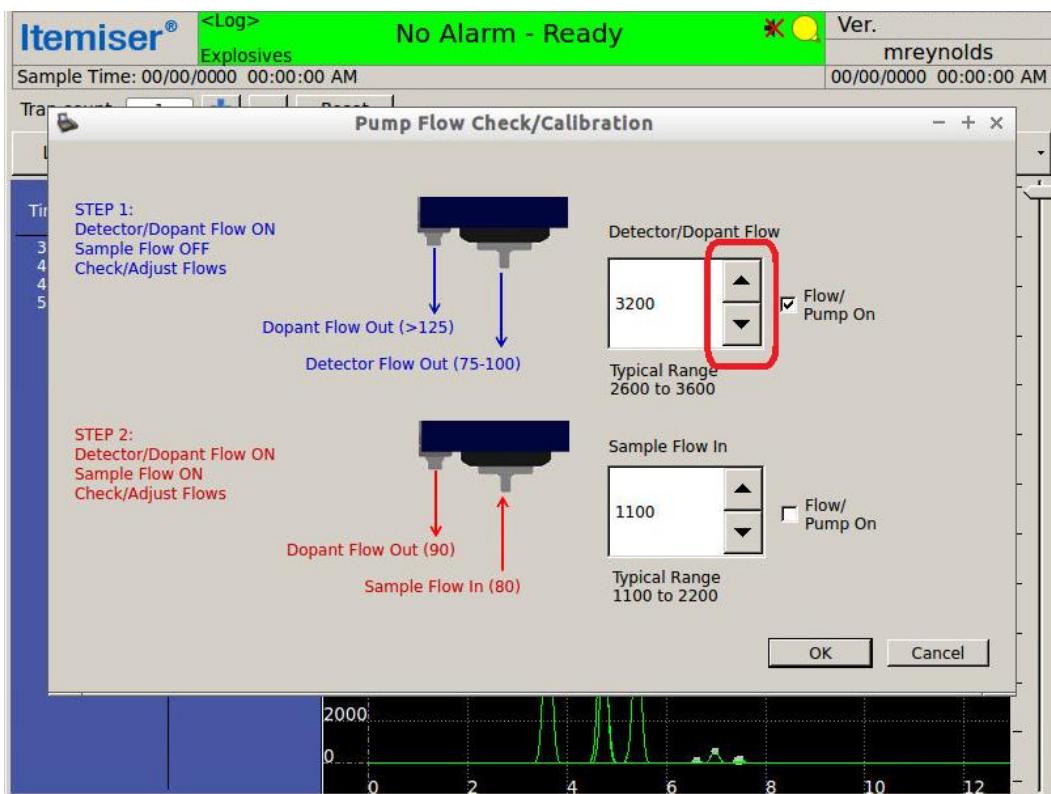
8. Keep the flow meter level to ensure an accurate reading.
9. Verify that the flow meter shows that the static dopant flow is greater than 125 cc/min.
10. Remove the bottom tube of the flow meter from the dopant fitting.
11. Remove the adapter tube (the small clear tube) from the bottom tube of the flow meter.

12. Connect the bottom tube of the flow meter to the nozzle:



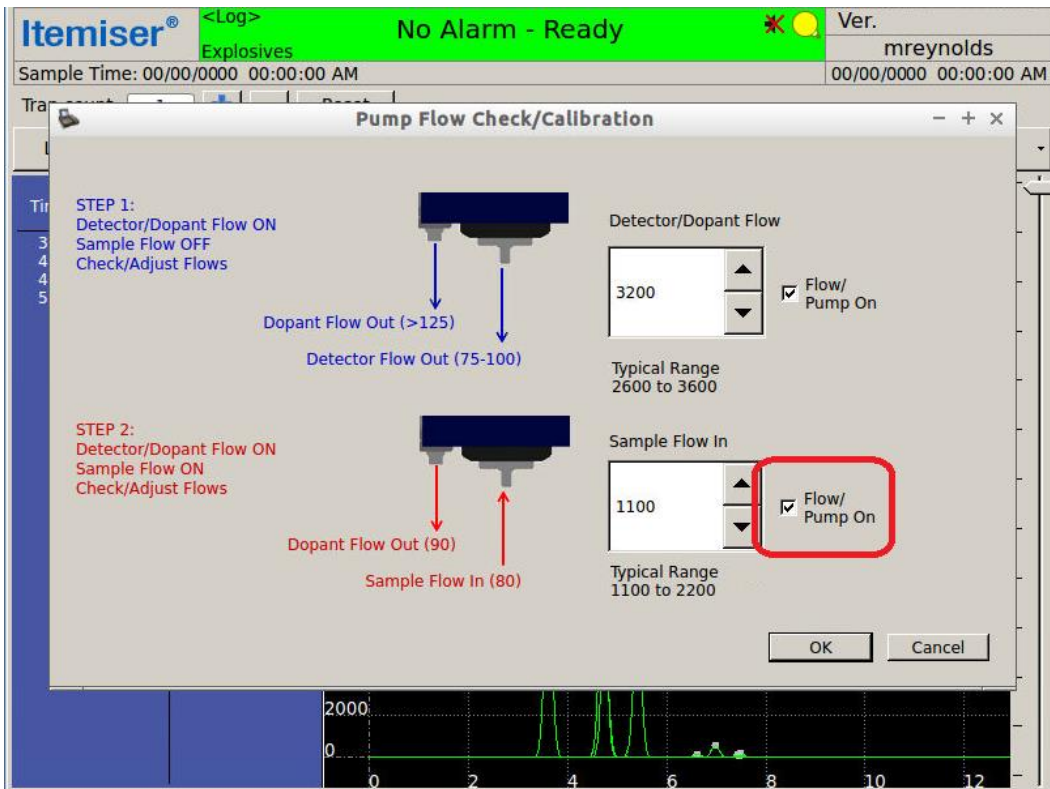
13. Verify that the flow meter reads 75-100 cc/min.

14. If the flow meter does not read 75-100 cc/min, adjust the **Detector/Dopant Flow** value up or down as needed to reach the 75-100 cc/min value. To do this, press the up- and down-arrows, or highlight the number and type the number you want:



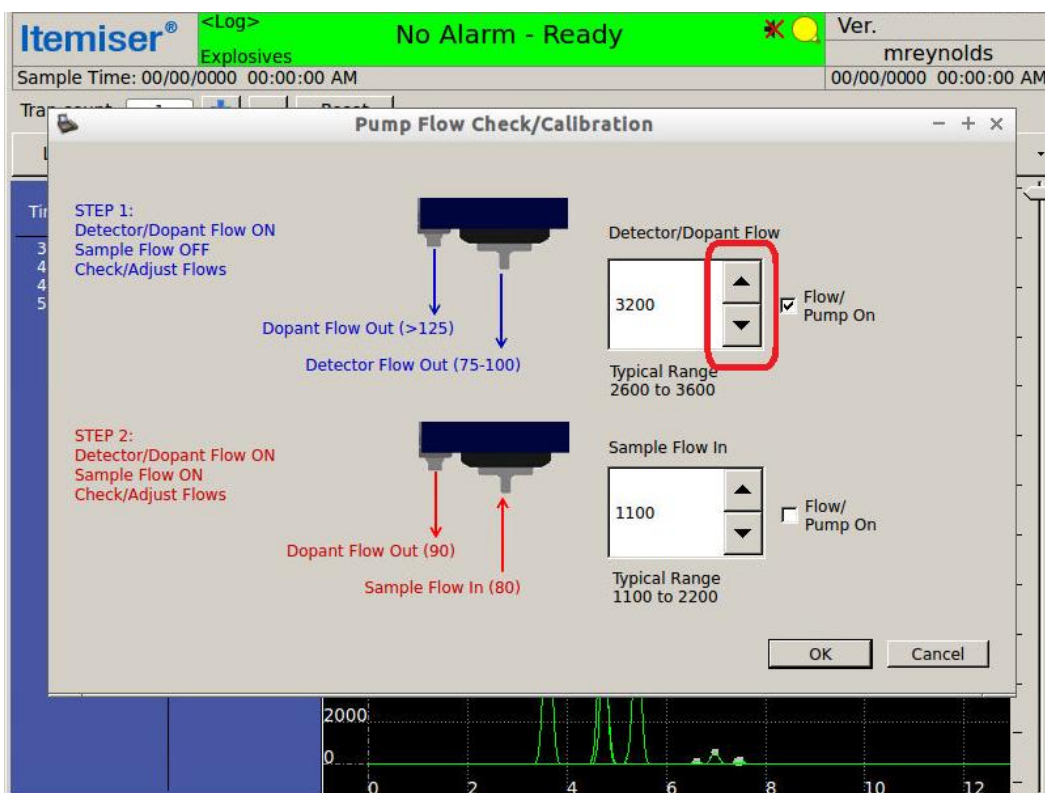
15. Remove the bottom tube of the flow meter from the nozzle.

16. Insert the adapter tube into the bottom tube of the flow meter.
17. Connect the bottom tube of the flow meter to the dopant fitting.
18. Check the **Flow/Pump On** check box for the sample flow:



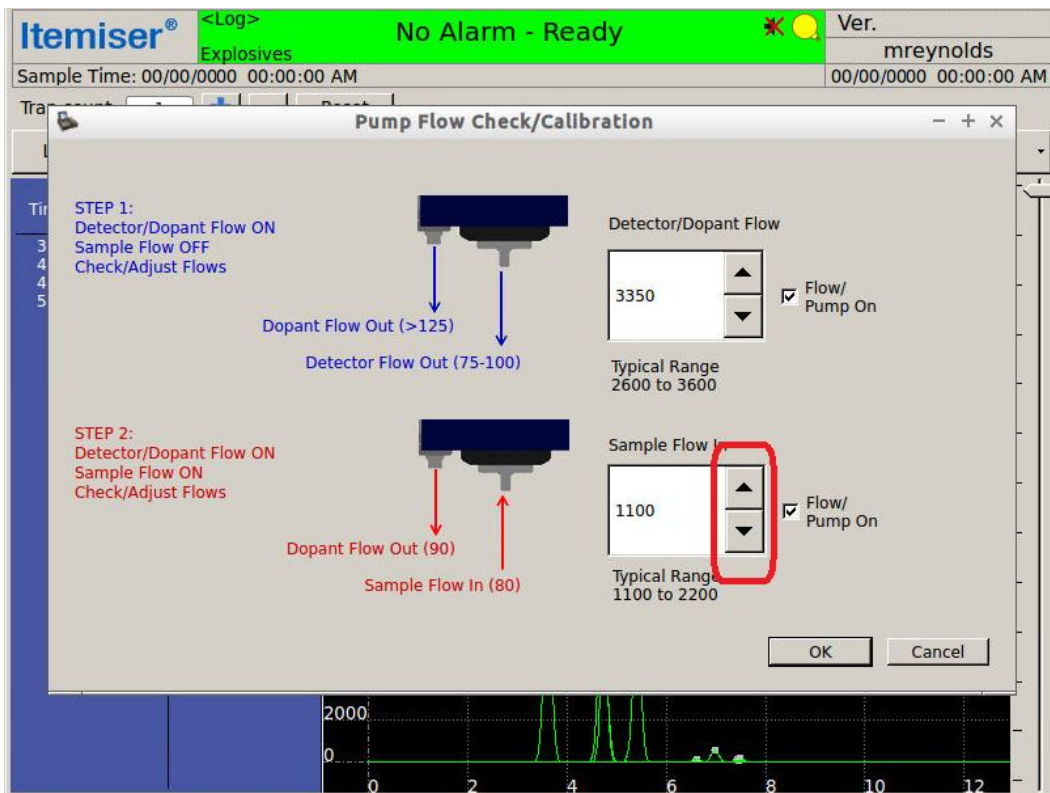
19. Verify that the dopant flow is approximately 90 cc/min.

20. If the flow meter does not read approximately 90 cc/min, adjust the **Detector/Dopant Flow** value up or down as needed to reach the 90 cc/min value. To do this, press the up- and down-arrows, or highlight the number and type the number you want:



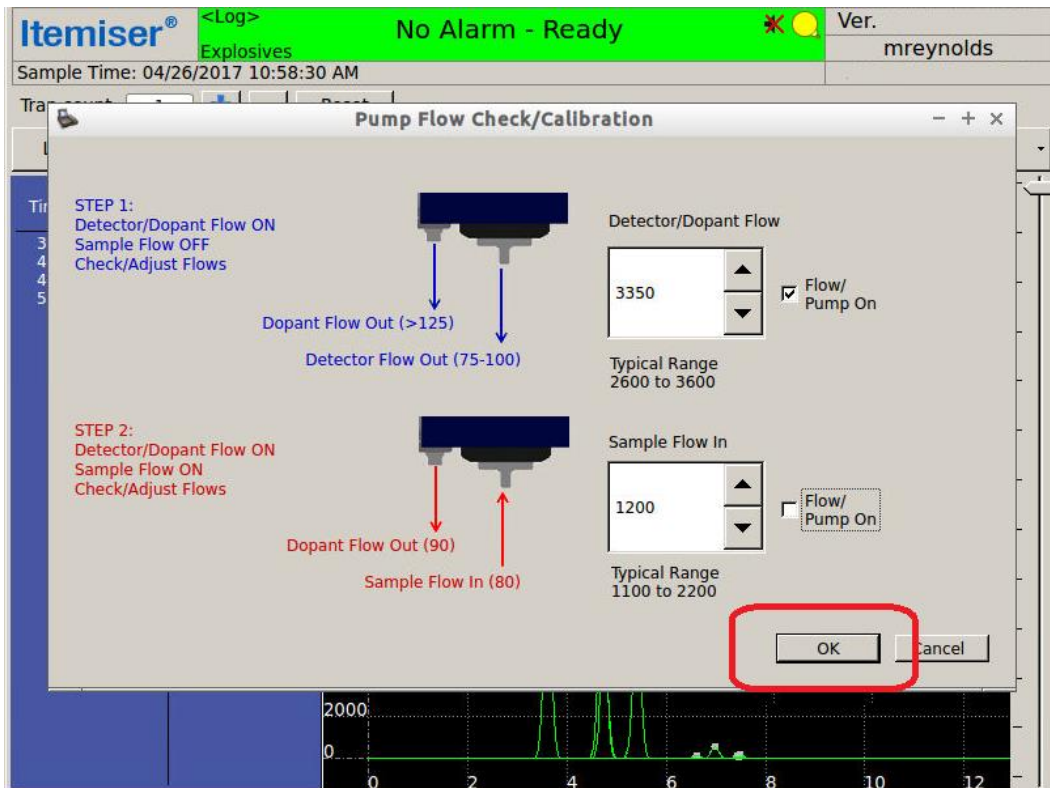
21. Remove the bottom tube of the flow meter from the dopant fitting.
22. Attach the top tube of the flow meter to the nozzle.
23. Verify that the sample flow is approximately 80 cc/min.

24. If the flow meter does not read approximately 80 cc/min, adjust the **Sample Flow In** value up or down as needed to reach the 80 cc/min value. To do this, press the up- and down-arrows, or highlight the number and type the number you want



25. Uncheck the *Sample Flow In* Flow/Pump On box.
26. Disconnect the flow meter from the device.

27. Press **OK**:



The screen displays the *Pump calibration saved* message.

28. Press **OK**.

The screen displays a message asking if you want to calibrate the flows.

29. Install the desorber.

30. Wait until the screen displays the *No Alarm-Ready* message.

31. Press **Yes**.

The screen displays a reminder message that warns you not to proceed until you have re-installed the desorber and waited until the screen displays the *No Alarm-Ready* message.

32. Verify that you have re-installed the desorber and that the screen is displaying the *No Alarm-Ready* message.

33. Press **OK**.

Your screen displays the *Measuring* message.

34. Wait until the screen displays the *No Alarm-Ready* message, and a message that lists the pump calibration values.

35. Press **OK**.

The screen displays the main window.

This completes the procedure.

Calibrate Purge Flow

Use the **Calibrate Purge Flow** button to set the windows for monitoring the on and off flow values. Only users at the maintenance and administrator levels have access to this function.



CAUTION

This is an advanced procedure that requires specialized technical knowledge. If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent. Incorrectly performing this procedure can also result in the improper functioning of the device itself. Contact Rapiscan Systems technical support for assistance.

Calibrate Sample Trap Sensor

Use the **Calibrate Sample Trap Sensor** button to calibrate the sensor that detects when there is a sample trap present in the desorber slot.

Only users at the maintenance and administrator levels have access to this function.

To calibrate the sample trap sensor:

1. Press **Menu** → **Advanced Menu**.
2. Press **Calibrate Sample Trap Sensor**.
The screen displays the *Sample Trap Calibration* window.
3. Press **Calibrate Trap Sensor**.
The screen displays an acknowledgement window.
4. Press **OK**.
The screen displays the *Sample Trap Calibration* window again.
5. Press **OK**.
The screen displays the main window.

This completes the procedure.

Calibrate Temperatures

Qualified service personnel use the **Calibrate Temperature** button to calibrate the temperature settings.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

Contact Rapiscan Systems technical support for assistance.

To calibrate the temperature settings:

1. Select **Menu** → **Advanced Menu**.
2. Press **Calibrate Temperatures**.

The screen displays a message that asks if you want to calibrate the desorber and detector offsets.

3. Press **Yes**.

The screen displays a message that verifies that the desorber and detector temperatures have been calibrated.

4. Press **OK**.

The screen displays the main window.

This completes the procedure.

Calibrate Touchscreen

Use the **Calibrate Touchscreen** button to calibrate the touchscreen:

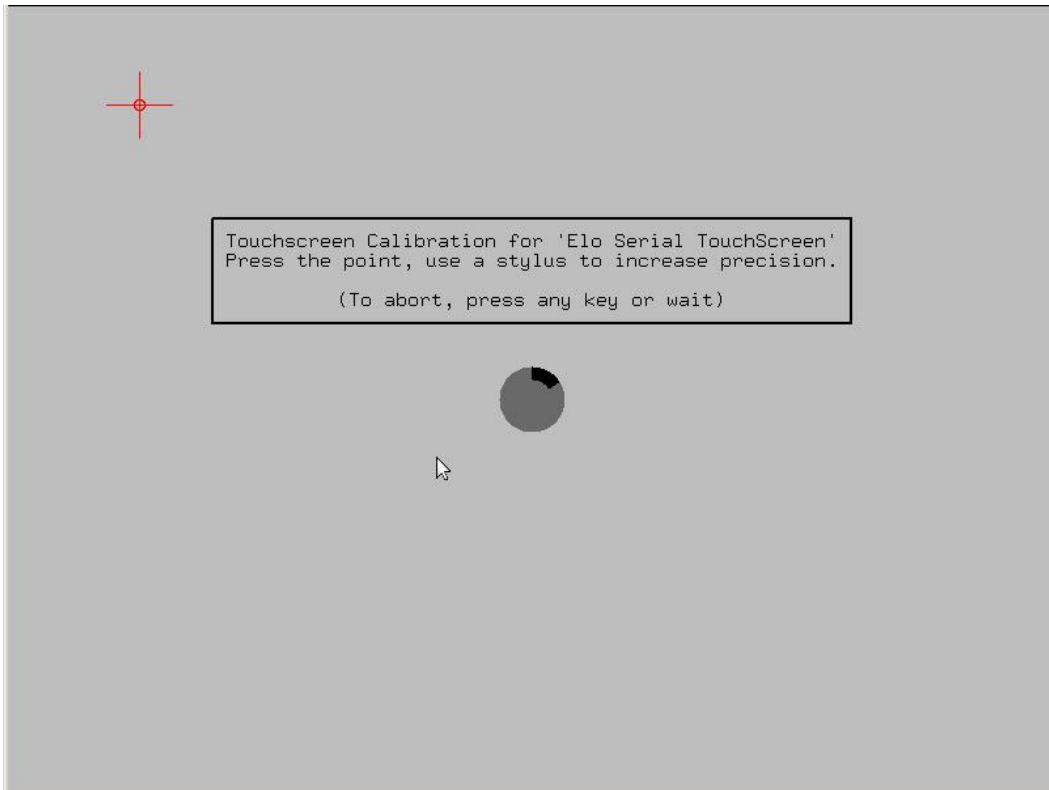
1. Select **Menu** → **Advanced Menu**.
2. Press **Calibrate Touchscreen**.

The screen displays a message that asks if you want to calibrate the touchscreen.

3. Press **Yes**.

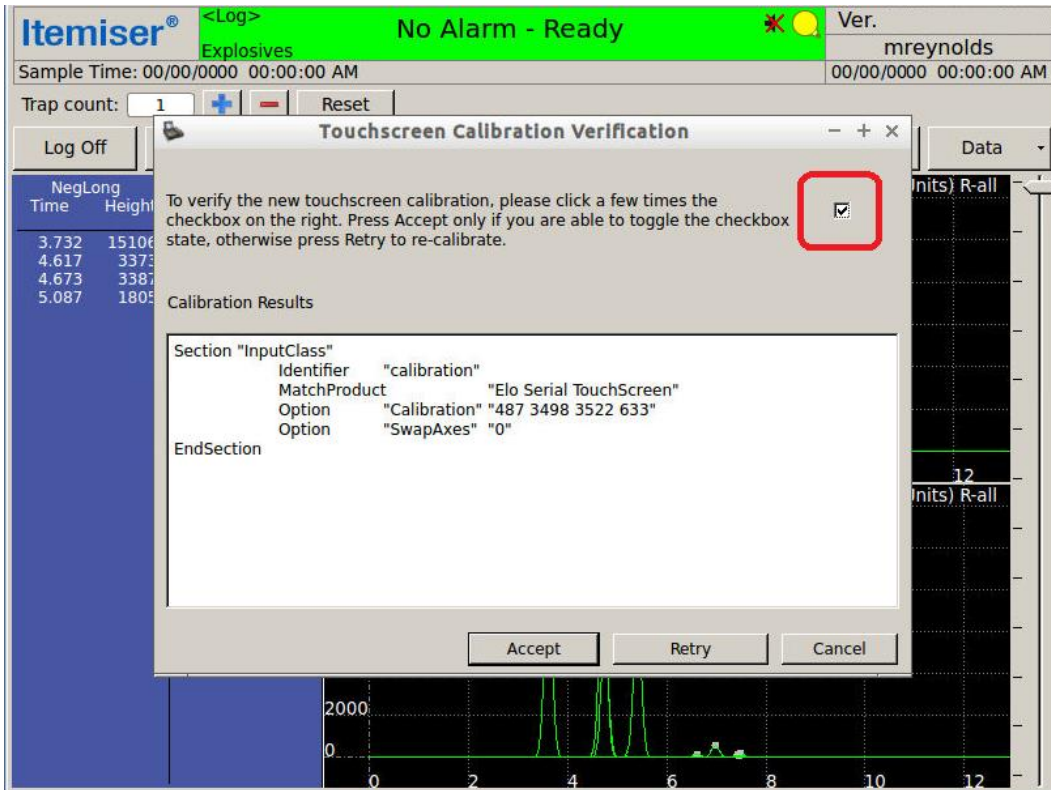
The screen displays the calibrate touchscreen window.

4. Touch the center of each cross-hairs symbol when it appears on the screen:



When you have calibrated all four cross-hairs symbols, the screen displays the *Touchscreen Calibration Verification* window.

- Press and then clear the check box a few times:



- Press **Accept**.

The screen displays a message that confirms it successfully saved the touchscreen calibration data.

- Press **OK**.

The screen displays the main window.

This completes the procedure.

Cancel

Press the **Cancel** button to close the *Menu* window and see the main window.

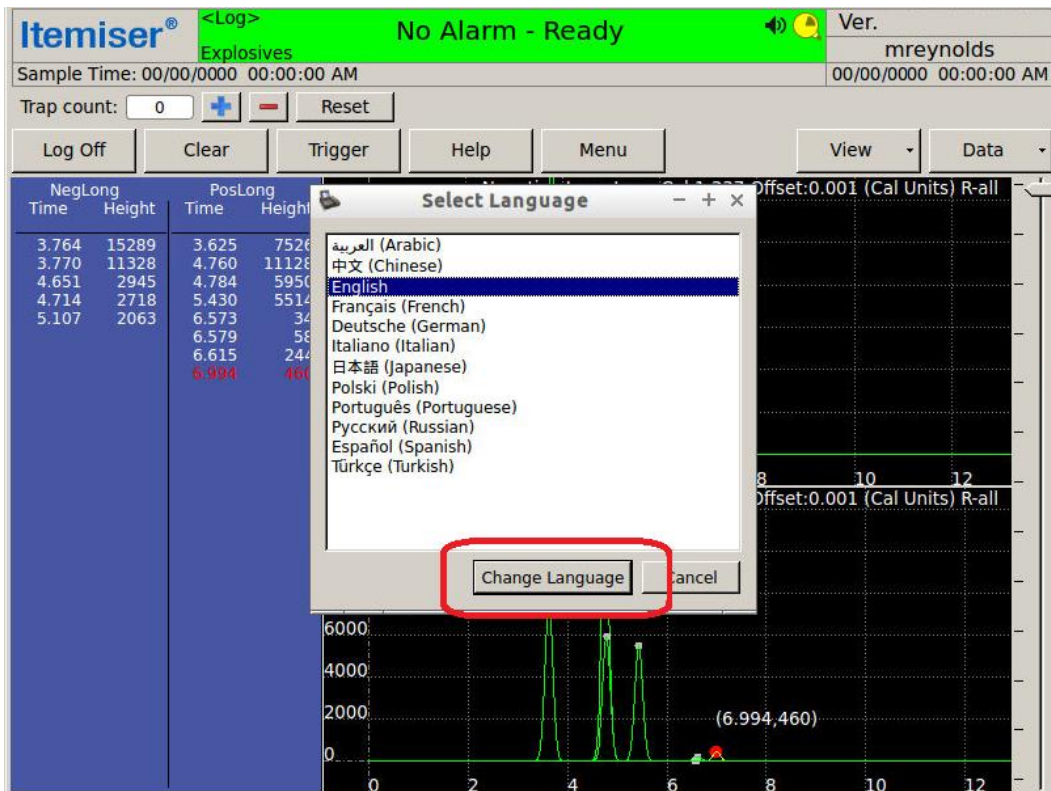
Change Language

Use the **Change Language** button to translate all text on the device screen to another language:

- Press **Menu** → **Advanced Menu**.
- Press **Change Language**.

The screen displays the *Select Language* window.

3. Press the language you want.
4. Press **Change Language**:



The screen displays a message that informs you that you must restart the ITMS software in order for your change to take effect.

5. Press **Yes**.

The device exits the ITMS software. After a moment, the screen displays the log-in window in the language you selected.

This completes the procedure.

Config/Notes

Press the **Config/Notes** button to display the device configuration, temperature and flow settings, and any notes that have been added for the given file.

Only users at the supervisor, maintenance, and administrator levels have access to this function.

To display the configuration information:

1. Press **Menu** → **Config/Notes**.

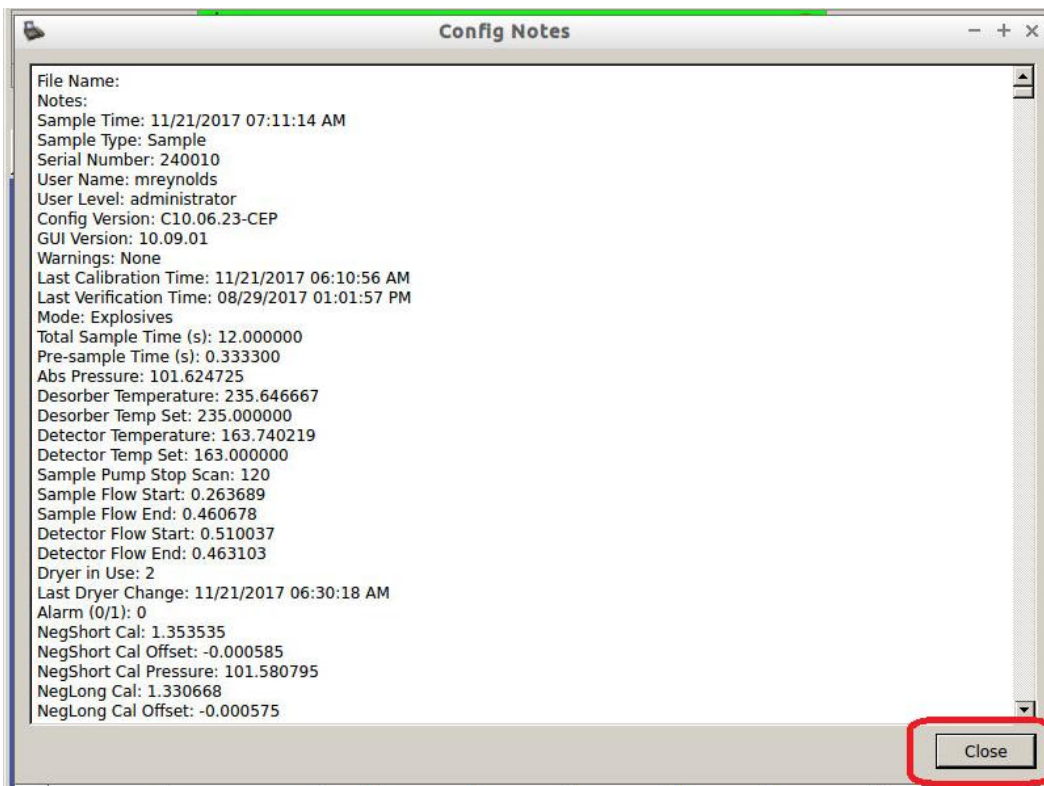
The screen displays a message that asks if you want it to display the XML configuration (note that this is available only to administrator-level users).

2. Press **Yes**.

The screen displays the *Config Notes* window.

Note that the *Config Notes* window displays only those substances that are selected for detection in the current detection mode ([see "Substances" on page 146](#)).

3. Press **Close** to exit:



The screen displays the main window.

Diagnostics and Logging

The **Diagnostics and Logging** feature helps field service personnel diagnose system operations. The status bar displays <Log> in the upper left corner when the diagnostics and logging feature is on (it is on by default).

Only users at the maintenance and administrator levels have access to this function.

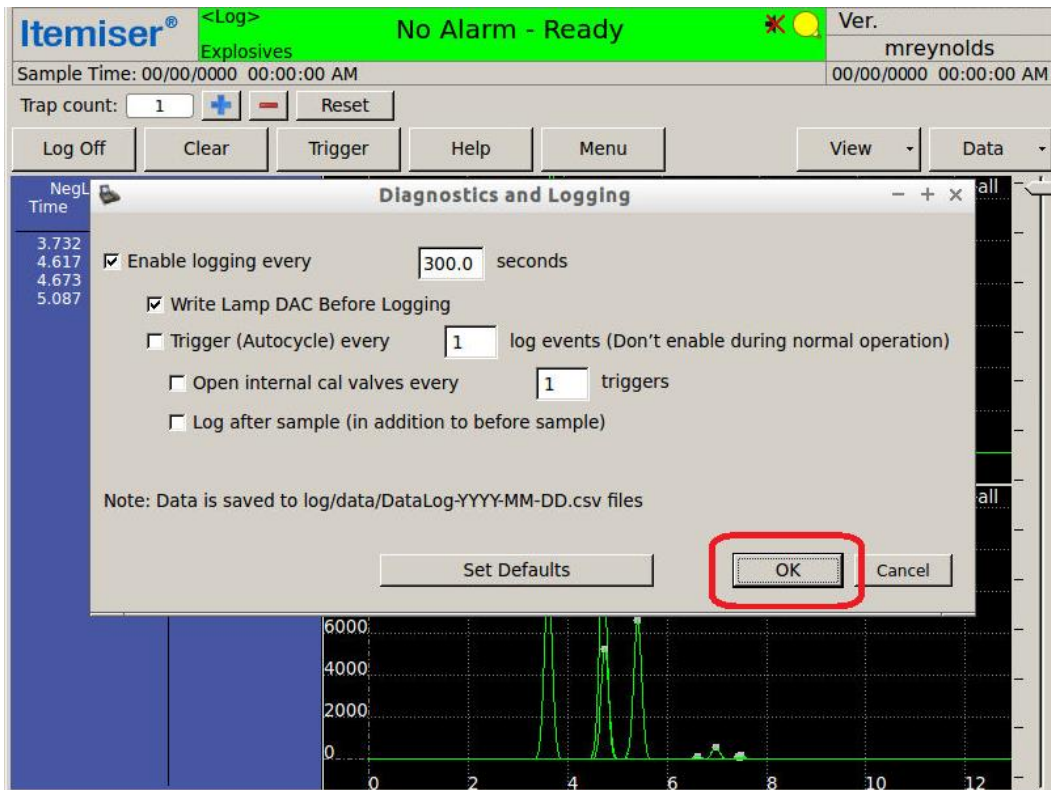
To make changes to the diagnostics and logging configuration:

1. Press **v**.

The screen displays the *Diagnostics and Logging* window.

2. Select or clear the check boxes to enable or disable the features you want:
 - *Enable logging every* is checked with a default logging interval of 300.0 seconds. The interval (seconds) is adjustable. The device saves the log file to the log folder located at `/mnt/data/itms/bin/log`.
 - *Write Lamp DAC Before Logging* is a diagnostic tool for the lamp.
 - *Trigger (Autocycle) every* - Automatically runs a sample sequence at the interval (seconds) entered. Typically used as a diagnostic tool to mimic high sampling rates.
 - *Open internal cal valves every* - Instead of just a trigger, the internal cal valves are opened so the device detects the cal peaks without performing a calibration.
 - *Log after sample (in addition to before sample)* - Logging before the sample records the state of the device just before the sample and *Log after sample* records the state after the sample. Can be used for troubleshooting flow warnings.

3. Press **OK** to close the *Diagnostics and Logging* window:



The screen displays the main window.

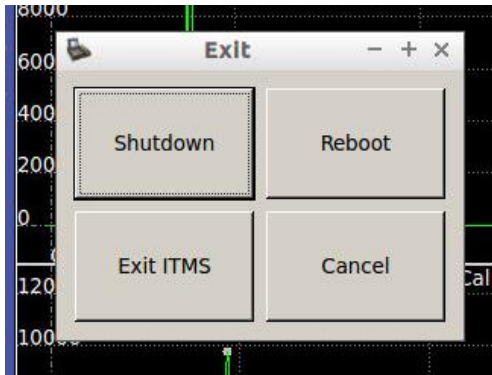
This completes the procedure.

Exit ITMS

Use the **Exit ITMS** button to perform any of three exit-related functions:

1. Press **Menu → Exit ITMS**.

The screen displays the *Exit* window:



2. Press the option you want:
 - Press **Shutdown** to immediately shut down the device.
 - Press **Reboot** to restart the ITMS software and the Linux operating system.
 - Press **Exit ITMS** to exit the ITMS software and go to the Linux desktop. To restart the ITMS software, press once anywhere on the touchscreen and then press the **Start ITMS** button
 - Press **Cancel** to close the Exit ITMS function and return to the ITMS software.

This completes the procedure.

External Calibrate

Use the **External Calibrate** button to perform an external calibration of the device.

The external calibration procedure is the first step you must take to resolve the *Calibration Warning* message. You might also need to perform the external calibration procedure at other times.

To perform an external calibration:

1. Press **Menu → External Calibrate**.

The status bar displays the *Insert Cal Trap* message.

It remains in this state until you insert a calibration trap into the desorber slot or press **Menu → External Calibrate** again to cancel the external calibration.

2. Put on a pair of clean, powder-free gloves.
3. Remove a calibration trap from the package.
4. Close the package cover immediately so as not to contaminate the calibration traps.

5. Insert the calibration trap into the desorber slot.

The device automatically begins the calibration process; the screen displays the *Sampling* message.

6. When the screen displays the *Please Remove Sample* message, remove the calibration trap and discard it immediately.

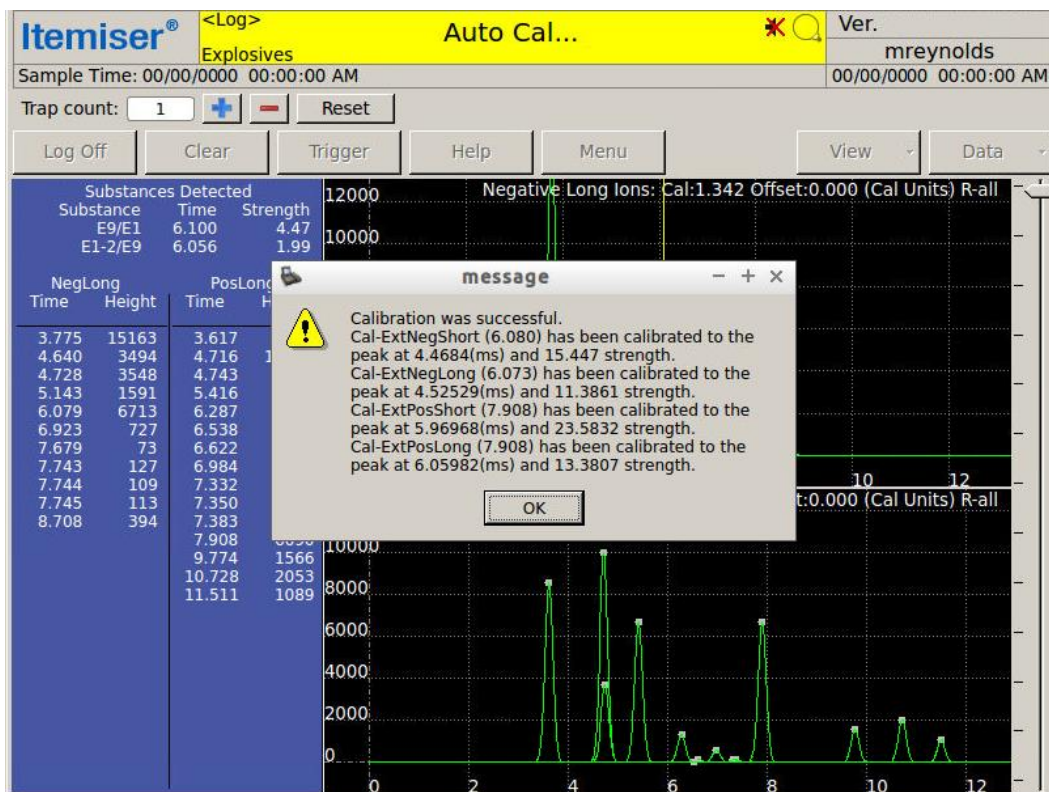


IMPORTANT

Never touch the sample area of a calibration or verification trap, or allow it to come into contact with any other object or surface.

The test substance on the trap can contaminate any surface, and cause a false indication of the presence of explosives.

The *List View* displays the results as *E9/E1* along with a *Calibration was Successful* message and automatically saves the calibration as a *CAL#####.sca* file.



If the calibration fails to recognize any of the *Cal-ExtNeg* or *Cal-ExtPos* peaks, you may receive a message indicating that one or more of the peaks was not found greater than the required peak height. Press **Retry** to repeat (use a new calibration trap). If the device still fails to calibrate, contact your supervisor to perform a manual calibration.

7. Press **OK**.

The screen displays the *Explosives Detected* message in the status bar.

8. Press **Clear**.

The device begins the clearing procedure; after a moment, the screen displays the *Insert Clean Trap* message.

9. Insert a clean sample trap.

10. When the screen displays the *Please Remove Sample* message, remove the trap.

Note that the clearing procedure may require you to insert the sample trap more than once.

After the device completes the clearing procedure, it displays the *No Alarm-Ready* message.

The device is now ready to analyze samples.

FPGA Diagnostics

Field service engineers use the FPGA Diagnostics settings to read and set the internal hardware levels for the device.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

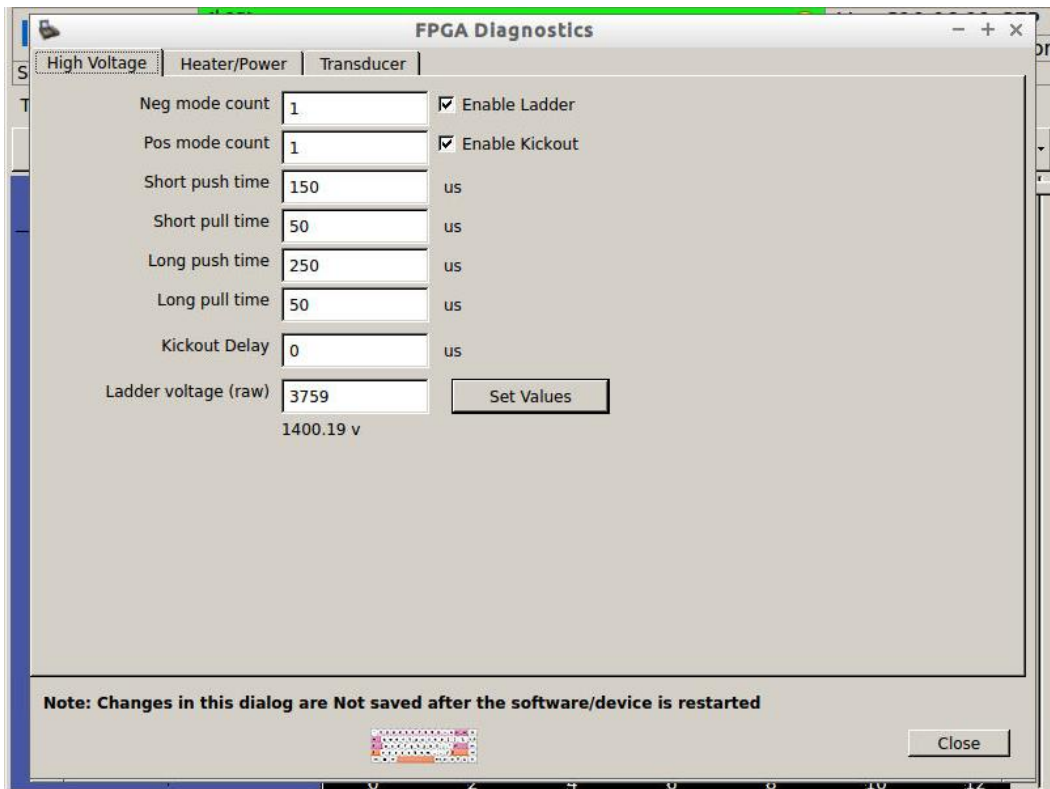
Contact Rapiscan Systems technical support for assistance.

High Voltage Tab

The *High Voltage* tab contains settings for the high-voltage board:

1. Press **Menu** → **Advanced Menu**.
2. Press **FPGA Diagnostics**.

The screen displays the *FPGA Diagnostics* window.



3. Press the **Set Values** button to reprogram the high voltage board. This function can be useful when troubleshooting a flatline plasmagram. It rewrites the values back to the board. You should not need to alter other values, as this changes the detection configuration.

4. Press **Close**

The screen displays a warning message that recommends that you restart the device, and asks if you want to restart it now.

5. Press **Yes**.

The software restarts the device.

Heater/Power Tab

The *Heater/Power* tab contains settings and measured values from the power board. The power board measures and controls system power and heaters:

1. Press **Menu** → **Advanced Menu**.
2. Press **FPGA Diagnostics**.

The screen displays the *FPGA Diagnostics* window.

3. Press the **Heater/Power** tab.

The screen brings it to the front.

The screenshot shows the **FPGA Diagnostics** window with the **Heater/Power** tab selected. The window is divided into several sections:

- Table of ADC Readings:**

	Raw 12-bit ADC	Filtered 12-bit ADC	Filtered voltage	Converted value from voltage to units
ADC_HEATER1_CH0_DES_TEMP	1930	1930.0	2.357 V	235.648 °C
ADC_HEATER1_CH1_DET_TEMP	1453	1453.2	1.774 V	163.761 °C
ADC_HEATER2_CH0_V1_EXT_DC	2985	2984.6	3.644 V	14.577 V
ADC_HEATER2_CH1_V2_MAIN_BAT	3386	3386.7	4.135 V	16.540 V
ADC_HEATER2_CH3_MAIN_CHG_CUR	0008	0007.6	0.009 V	0.009 A
ADC_HEATER2_CH6_BOARD_TEMP	0843	0843.0	1.029 V	52.935 °C
- DIO Heaters:**
 - DIO_HEATER_B_BIT0_FAULT_DET: 0
 - DIO_HEATER_B_BIT1_FAULT_DES: 0
 - DIO_HEATER_B_BIT2_PPWR_SW_OFF: 0
 - DIO_HEATER_B_BIT3_V1_GOOD: 1
 - DIO_HEATER_B_BIT4_V2_GOOD: 1
 - DIO_HEATER_B_BIT6_M_CHG_CUR_LOW: 0
- Power switch logic:**
 - 5
 - 6
 - 7
 - 8
 - 9
- DAC Settings:**
 - Detector DAC: 2901 (Set)
 - Desorber DAC: 3855 (Set)
- Checkboxes:**
 - ☐ PWR_SW_EN
 - ☐ EN_DET_OFF
 - ☐ EN_DES_OFF
 - ☒ DAC_Reset_OFF
 - ☒ Fault_Reset_OFF
 - ☒ EN_Main_CH_OFF
 - ☒ EN_Bkup_CH_OFF
- Buttons:** Set Dig Out, Close

Red arrows in the image point to the following elements:

- Raw 12-bit ADC column
- Filtered 12-bit ADC column
- Filtered voltage column
- Converted value from voltage to units column
- Detector DAC Set button
- Desorber DAC Set button
- Power switch logic section
- EN_Main_CH_OFF checkbox

Note: Changes in this dialog are Not saved after the software/device is restarted

4. Make the changes you want.

Table 3-7 Heater/Power Board Data

No.	Description
1	Actual voltage coming into the system.
2	Voltage of the battery
3	Measurement of charge going into the battery.
4	Temperature of the board in degrees Celsius.
5	Detector status: 0 indicates that the detector is functioning normally. 1 indicates that the detector is not functioning normally.
6	Desorber status: 0 indicates that the desorber is functioning normally. 1 indicates that the desorber is not functioning normally.
7	Digital measurement of power supply: 0 indicates that the power supply is not functioning normally. 1 indicates that the power supply is functioning normally.
8	Digital measurement of main battery: 0 indicates that the battery is not functioning normally. 1 indicates that the battery is functioning normally.
9	Battery charger indicator: 0 indicates that the battery charger is not currently in use. 1 indicates that the battery charger is in use.
10	Sets the raw 12-bit DAC value for the detector and desorber. Used for diagnosing temperature issues with the desorber or detector.
11	Digital outputs. Check to turn the heaters off. For example, check EN = enable, DET = detector, OFF to turn the detector heater OFF or reset the circuits.

5. Press **Close**

The screen displays a warning message that recommends that you restart the device, and asks if you want to restart it now.

6. Press **Yes**.

The software restarts the device.

Transducer Tab

The *Transducer* tab contains settings and measured values from the transducer board, which measures and controls system flows, pressure, and pumps:

1. Press **Menu** → **Advanced Menu**.
2. Press **FPGA Diagnostics**.

The screen displays the *FPGA Diagnostics* window.

3. Press the *Transducer* tab.

The screen brings it to the front.

FPGA Diagnostics

	Raw 12-bit ADC	Filtered 12-bit ADC	Filtered voltage	Converted value from voltage to units
ADC_TRANS_CH0_DET_PRES	0460	0459.9	0.561 V	0.562 V
ADC_TRANS_CH1_ABS_PRES	3330	3330.0	4.066 V	100.910 kPa
ADC_TRANS_CH2_SAMPLE_PRES	0214	0214.2	0.261 V	0.262 V
ADC_TRANS_CH3_BOARD_TEMP	0789	0788.5	0.963 V	46.272 °C
ADC_TRANS_CH4_DRYER_PRG_PRES	0191	0190.9	0.233 V	0.233 V
ADC_TRANS_CH5_DOPANT_TEMP	2050	2050.4	2.503 V	45.674 °C
ADC_TRANS_CH6_DRYER1_TEMP	1795	1795.1	2.192 V	92.901 °C
ADC_TRANS_CH7_DRYER2_TEMP	1654	1654.0	2.020 V	46.120 °C
DIO_DIRECT_IN_BIT0_TRAP_INSERT	0			
DIO_DIRECT_IN_BIT1_LAMP_SHORTn	1			
DIO_DIRECT_IN_BIT2_LAMP_FAILn	1			
DIO_DIRECT_IN_BIT3_HT_DIO_INT	1			

Controls:

- ☐ NC1
- ☐ NC2
- ☐ SPARE
- ☐ LAMP_OFF (old)
- ☒ BEEPER_OFF
- ☐ FAN_OFF
- ☐ PWR_LED_OFF
- ☐ DOP_HTR_OFF
- ☒ DRY_HTR1_OFF
- ☒ DRY_HTR2_OFF
- ☐ DRY_VALVE1_OFF
- ☒ DRY_VALVE2_OFF
- ☒ CAL_VALVE1_OFF
- ☒ CAL_VALVE2_OFF
- ☐ PRG_VALVE1_OFF
- ☒ PRG_VALVE2_OFF

DAC Settings:

- Det Pump DAC: 3200 [Set]
- Sample Pump DAC: 1100 [Set]
- Purge Pump DAC: 0 [Set]
- Sample Trap DAC: 1200 [Set]
- Lamp DAC: 2867 [Set]

Other Settings:

- ☒ Det Enable
- ☐ Smp Enable
- ☐ Smp Valve On
- ☒ Purge Enable
- ☒ Lamp Enable

Set A: 0x10

Set B: 0xbb

Note: Changes in this dialog are Not saved after the software/device is restarted

Close

4. Make the changes you want.

Table 3-8 *Transducer board data*

No.	Description
1	Sample trap sensor: 0 indicates that there is no trap inserted in the desorber slot. 1 indicates that there is a trap inserted in the desorber slot.
2	Lamp short sensor: 0 indicates that the lamp is operating. 1 indicates that the lamp is not operating.
3	Lamp output sensor: 0 indicates that the lamp is producing normal output. 1 indicates that the lamp is not producing normal output.
4	Not used.
5	Bank A digital output; press Set A to set the value in hardware.
6	Bank B digital output; press Set B to set the value in hardware.
7	Hexadecimal representation of the digital output.
8	Digital outputs. Check the box to turn the corresponding function off. For example, check DRY_HTR1_OFF to turn the dryer 1 heater off. Note that some boxes are not used (these are grayed out).
9	Sets the raw 12-bit DAC value for the detector, sample, and purge pumps. Sample Trap DAC is for troubleshooting the sample trap sensor in the desorber after the advanced menu function of calibrate sample trap sensor was unsuccessful. Lamp DAC is for troubleshooting the lamp intensity after the advanced menu function of set lamp intensity was unsuccessful.

5. Press **Close**.

The screen displays a warning message that recommends that you restart the device, and asks if you want to restart it now.

6. Press **Yes**.

The software restarts the device.

This completes the procedure.

History Data Export

During operation, the Itemiser® 4DX automatically records session information in the *History* file:

- Files saved
- Warnings issued
- Log-on and log-off information
- Alarm events
- Manual and automatic calibrations performed
- Additional information

You can copy these history files to a USB storage device for further analysis.

Only users at the supervisor, maintenance, and administrator levels have access to this function.

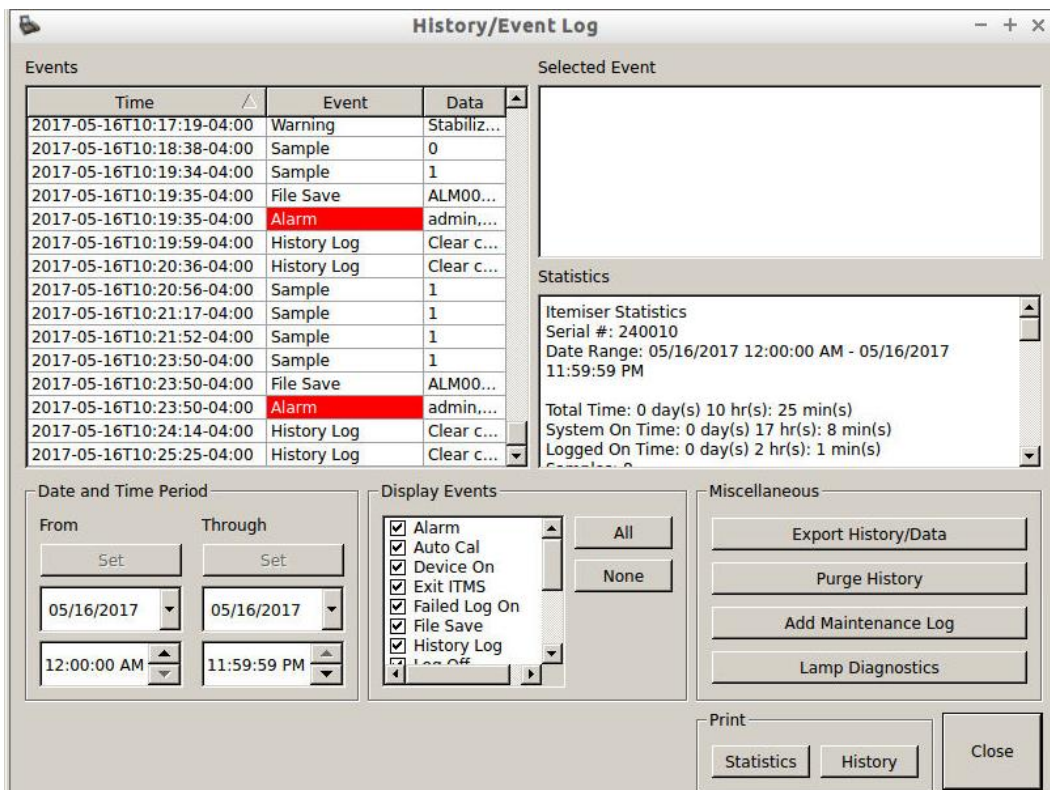
Note that you need a keyboard to perform some of the functions described in this section:

1. Press **Menu** → **History Data Export**.

The screen displays the *History/Event Log* window, which includes three panes (sections):

- The history log (*Events* window)
- The device information for an alarm, warning, or event selected in the history log (*Selected Event* window)
- The device statistics (*Statistics* window)

Note that the *History/Event Log* window displays all alarm events highlighted in red.



- To set the date and time range you want to see, use the **From** and **Through** drop-down lists .

- To see the entire list (in any of the windows), use the scroll bars.
- To see details on an entry, highlight the entry in the *Events* window. The screen displays the detail in the *Selected Event* pane.
- The *Statistics* window lists user actions for the date range selected.
- To filter the data by category, select the events you want from the *Display Events* section.
- To record any maintenance tasks you perform, press **Add Maintenance Log** and enter a description ([see "Adding a Maintenance Log Entry" below](#)).

This completes the procedure.

Adding a Maintenance Log Entry

Add a maintenance log entry whenever you perform any maintenance procedure. This greatly assists field service technicians in diagnosing and solving problems.

To add a maintenance log entry:

1. Press **Menu → History Data Export**
The screen displays the *History/Event Log* window.
2. Press **Add Log**.
The screen displays the *Log Maintenance* window.
3. Select all check boxes that apply. You can also add a note in either text field.

4. Press **Save**:

The device adds your log item to the *Events* list.

5. To view the complete log entry, scroll to it in the *Events* list and press the entry.

The screen displays the complete log entry in the *Selected Event* pane.

This completes the procedure.

Printing Statistics

Use the **Print Statistics** button to print the device statistics displayed in the *History/Event Log* window:

1. Press **Menu → History Data Export**.
The screen displays the *History/Event Log* window.
2. Press the **From:** field and type the start date and time you want.
3. Press the **Through:** field and type the ending date and time you want.
4. Press the **Statistics** button (in the **Print** section at the bottom of the window).
The device prints the statistics for that date range using the default printer.

Available statistics include:

- Serial number
- Date and time range
- Samples
- Maintenance logs
- System on
- ITMS exits
- Shut-downs
- Failed log-on attempts
- Log-on events
- Log-off events
- Alarms
- Calibrations
- Verifications
- Configuration changes
- Mode changes
- File saves
- History logs
- Warnings



IMPORTANT

Due to the characteristics of thermal printer paper, anything printed on it fades over time, or when exposed to heat. If you need to maintain anything printed by the integral printer, scan or copy it as soon as possible.

Printing History

To print the device history:

1. Press **Menu → History Data Export**.
The screen displays the *History/Event Log* window.
2. Press the down-arrow to the right of the **From** field and select the starting date you want.

3. Press the down-arrow to the right of the **Through** field and select the ending date you want.
4. Press the **History** button (in the **Print** section at the bottom of the window).

The screen displays the *Print History* window. It notes that printing the history on the integral printer uses a lot of paper and time, and that exporting the history to a USB storage device is more efficient (*see "Exporting History Data" below*).

5. Press **Yes** to print the history, or **No** to cancel.

The history data includes:

- Serial number
- Date range
- External calibration
- Warnings
- Log-on information
- User
 - Level
 - Serial number
 - Detection mode
- Log-off information
 - User
 - Samples
 - Alarms
 - Saved files
- System clean start and end times
- Failed log-on attempts
- Log-off without clearing alarm



IMPORTANT

Due to the characteristics of thermal printer paper, anything printed on it fades over time, or when exposed to heat. If you need to maintain anything printed by the integral printer, scan or copy it as soon as possible.

Exporting History Data

You can export history files to a USB storage device:

1. Insert a USB storage device into the USB port on the back of the device.
2. Select **Menu → History Data Export**.
3. Press the date in the **From** field and type the beginning date you want.
4. Press the time in the **From** field and type the beginning time you want.
5. Press the date and time in the **Through** field and type the ending date and time you want.
6. Press **Export History/Data**.

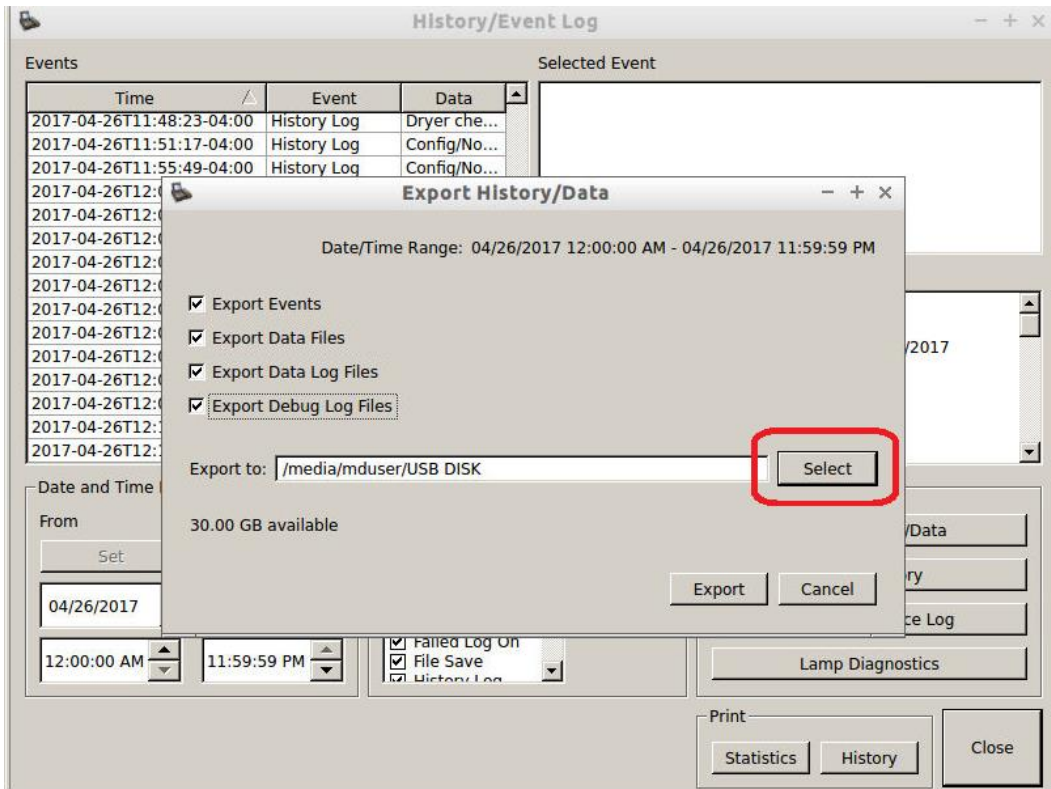
The screen displays the *Export History/Data* window.

7. Select the check box for each file you want to export:

- **Export Events**
- **Export Data Files**
- **Export Data Log Files**
- **Export Debug Log Files**

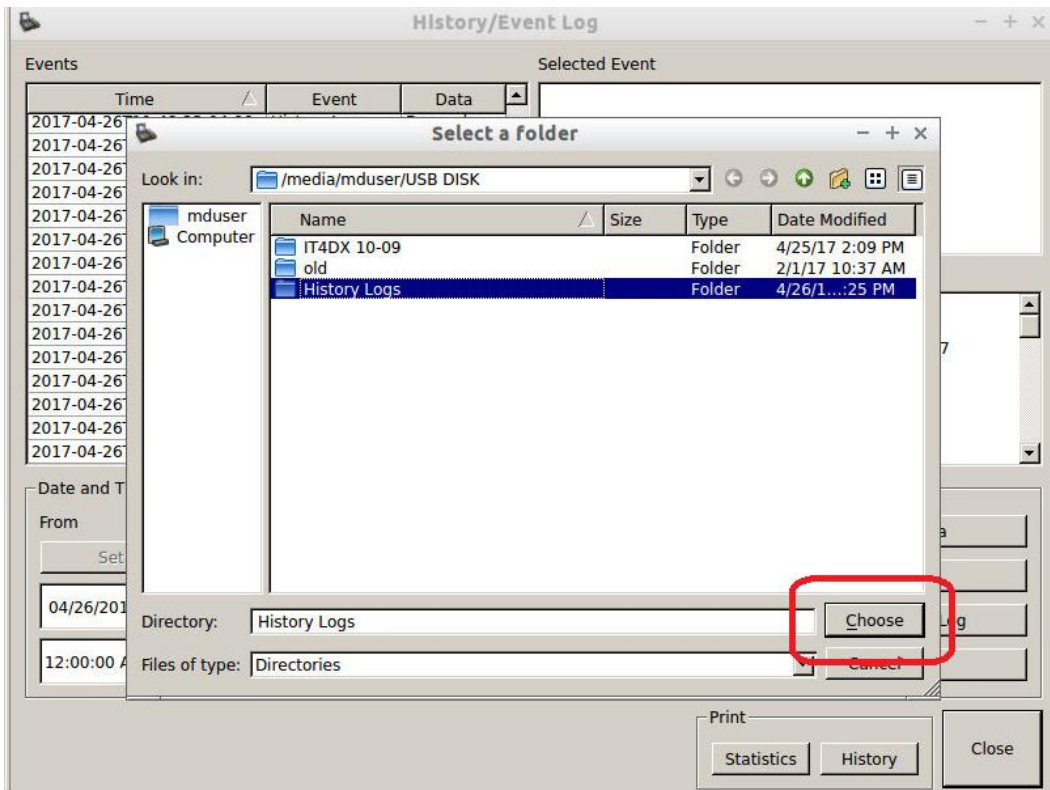
You can select as many as you want.

8. Press **Select**:



The screen displays the *Select a folder* window.

9. (Optional) To choose a different destination for your export, press the down-arrow to the right of the **Look in:** field and then press the destination you want.
10. Press the folder to export the data to.

11. Press **Choose**:

The screen again displays the *Export History/Data* window. The window now displays the destination you chose in the **Export to** field.

12. Press **Export**.

The device exports the data you specified.

The screen displays the *Export Data Report* window, which describes the result of the procedure. All data files are in the comma-separated value (.csv) format, which is compatible with Microsoft® Excel and other programs.

To change the file type of the .csv file:

- Open the file in Excel.
- Click **File → Save As**.
- Click the down-arrow in the **Save as type** field, and select the file type you want.
- Click **Save**.

13. Press **OK**.

The screen displays a reminder to remove the USB storage device safely.

14. Press **OK**.15. Press **Close**.

The device closes the *History/Event Log* window and displays the main screen.

16. Press **Menu/Safely Remove USB hardware**.

The screen displays the *Safely Remove USB Device* window.

17. Select the device you want to remove.

18. Press **Remove**.

The screen displays the *Remove USB Device* window.

19. Press **OK**.

The screen displays the main window.

20. Remove the USB storage device.

Analyzing Exported History Data

Use the *Export History/Data* function to save the data log, the event log, and the debug log:

1. Open the history log file using any spreadsheet application that reads .csv files (such as Microsoft® Excel).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Date/Time	Hours	On Hours	NegShort x y	Cal	NegLong x y	Cal	PosShort x y	Cal	PosLong x y	Cal	PosLong x y	Cal	PosLong x y	Cal
2	2015-07-22T00:03:38-04:00	0.060555556	38.58527778	0	0	1.330755	0	0	1.310489	0	0	1.301885	0	0	1.283663
3	2015-07-22T00:08:38-04:00	0.143888889	38.66861111	0	0	1.330757	0	0	1.310491	0	0	1.301888	0	0	1.283665
4	2015-07-22T00:13:38-04:00	0.227222222	38.75194444	0	0	1.330701	0	0	1.310436	0	0	1.301833	0	0	1.283611
5	2015-07-22T00:18:38-04:00	0.310555556	38.83527778	0	0	1.330661	0	0	1.310396	0	0	1.301794	0	0	1.283573
6	2015-07-22T00:23:38-04:00	0.393888889	38.91861111	0	0	1.330505	0	0	1.310243	0	0	1.301641	0	0	1.283422
7	2015-07-22T00:28:38-04:00	0.477222222	39.00194444	0	0	1.330453	0	0	1.310191	0	0	1.30159	0	0	1.283372
8	2015-07-22T00:33:38-04:00	0.560555556	39.08527778	0	0	1.330435	0	0	1.310174	0	0	1.301572	0	0	1.283354
9	2015-07-22T00:38:38-04:00	0.643888889	39.16861111	0	0	1.330419	0	0	1.310158	0	0	1.301557	0	0	1.283339
10	2015-07-22T00:43:38-04:00	0.727222222	39.25194444	0	0	1.330439	0	0	1.310178	0	0	1.301577	0	0	1.283359
11	2015-07-22T00:48:38-04:00	0.810555556	39.33527778	0	0	1.330484	0	0	1.310222	0	0	1.301621	0	0	1.283402
12	2015-07-22T00:53:38-04:00	0.893888889	39.41861111	0	0	1.330412	0	0	1.310151	0	0	1.30155	0	0	1.283332

The data log file contains a large number of columns of data not shown in the screenshot. Scroll to the right to see more data.

	A	B	C	D	E	F	G	H
1	2015-07-22T00:00:08-04:00	History Log	240222	Lamp On				
2	2015-07-22T00:00:23-04:00	History Log	240222	Lamp Off				
3	2015-07-22T00:00:23-04:00	History Log	240222	Started Thermal Clean				
4	2015-07-22T00:07:38-04:00	History Log	240222	Dryer check: purging dryer: 1 purge pump: 3000				
5	2015-07-22T00:07:38-04:00	History Log	240222	Dryer check: dryer 2 cooled to: 59.2674				
6	2015-07-22T00:38:08-04:00	History Log	240222	Dryer check: dryer 1 heated to: 203.316				
7	2015-07-22T00:45:40-04:00	History Log	240222	Thermal Clean: Completed. Switching to inactive stage				
8	2015-07-22T01:04:36-04:00	History Log	240222	Lamp On				
9	2015-07-22T01:04:54-04:00	Auto Cal	240222	Cal-IntNegShort	5.168	0	1.32969	100.286
10	2015-07-22T01:04:54-04:00	Auto Cal	240222	Cal-IntNegLong	5.179	0	1.31434	100.286
11	2015-07-22T01:04:54-04:00	Auto Cal	240222	Cal-IntPosShort	9.784	2.48698	1.30139	100.286
12	2015-07-22T01:04:54-04:00	Auto Cal	240222	Cal-IntPosLong	9.772	0	1.28298	100.286

- Column A - Date and Time
- Column B - Event Type
- Column C - Serial Number
- Column D - Event description
- Columns E, F, G, and H are dependent upon the event type

The debug log file contains a large number of columns of data not shown in the screenshot. Scroll to the right to see more data:

	A	B	C	D
1	2015-07-22T00:00:08-04:00	Debug	SetLampState: true m_DirectOutStates: "00010001"	
2	2015-07-22T00:00:23-04:00	Debug	"SPI_CS_DIO_HEATER_MCP23S17 write port A: 0xf8	248"
3	2015-07-22T00:00:23-04:00	Debug	SetLampState: false m_DirectOutStates: "00011001"	
4	2015-07-22T00:00:23-04:00	Debug	SetDACRaw(SPI_CS_DAC_DET_HEAT_AD7390	3415)
5	2015-07-22T00:00:23-04:00	Debug	SetDACRaw(SPI_CS_DAC_DES_HEAT_AD7390	4018)
6	2015-07-22T00:03:38-04:00	Debug	SetDACRaw(SPI_CS_DAC_LAMP_AD7390	2867)
7	2015-07-22T00:04:29-04:00	Debug	Thermal Clean: switching to cleaning stage	
8	2015-07-22T00:07:38-04:00	Debug	PurgeDryer: 1 heat: true iPurgeSpeed: 3000	
9	2015-07-22T00:07:38-04:00	Debug	"SPI_CS_DIO_XD_MCP23S17 write port B: 0xba	186"
10	2015-07-22T00:07:38-04:00	Debug	SetDACRaw(SPI_CS_DAC_PURGE_MAX5352	3000)

- Column A - Date and Time
- Column B - Event Type
- Column C and D - Debug Log Details

Purging History

Use the History Data Export function to purge the history data files stored on the device.



CAUTION You cannot recover history data files after you have purged them.

To purge the history data:

1. Press **Menu** → **History Data Export**.

The screen displays the *History/Event Log* window.

2. Press the date in the **From** field and type the date you want.
3. Press the time in the **From** field and type the time you want.
4. Press **Purge History**.

The screen displays a message that asks if you want to purge the history before the date you specified.

5. Press **Yes**.

The screen displays a message displays that asks if you also want to remove all data files in `c:\itmswin\alarms\` before MM/DD/YYYY .

6. Press **Yes**.

If you press **No**, the devices purges the history data but not the alarm files.

The screen displays the main window.

This completes the procedure.

Lamp Diagnostics

Use the Lamp Diagnostics function to view a display of the lamp offsets over a selected time period.

To view the lamp diagnostics display:

1. Press **Menu** → **History Data Export**.

The screen displays the *History/Event Log* window.

2. Click the down-arrow in the **From** field.

The screen displays a small calendar.

3. Scroll (if necessary) to the starting date you want, and click it.

4. Press the up- or down-arrows in the time field to select the starting time you want.

5. Press the down-arrow in the **Through** field.

The screen displays a small calendar.

6. Scroll (if necessary) to the ending date you want, and click it.

7. Press the up- or down-arrows in the time field to select the ending time you want.

8. Press **Lamp Diagnostics**:

The screenshot shows the 'History/Event Log' window. It features a table of events, a 'Selected Event' pane, and a 'Statistics' pane. At the bottom, there are several control panels. A red box highlights the 'Date and Time Period' panel, which includes 'From' and 'Through' date/time pickers. Another red box highlights the 'Miscellaneous' panel, specifically the 'Lamp Diagnostics' button. The 'Display Events' panel shows a list of event types with checkboxes, and the 'Print' panel has buttons for 'Statistics', 'History', and 'Close'.

Time	Event	Data
2017-05-17T05:46:48-04:00	History Log	Purge heatin...
2017-05-17T05:46:48-04:00	History Log	Dryer check: ...
2017-05-17T06:07:02-04:00	History Log	Lamp On
2017-05-17T06:07:02-04:00	Warning	Starting Lam...
2017-05-17T06:07:08-04:00	Warning	Starting Lam...
2017-05-17T06:07:25-04:00	Auto Cal	Cal-IntNegSh...
2017-05-17T06:07:25-04:00	Auto Cal	Cal-IntNegLo...
2017-05-17T06:07:25-04:00	Auto Cal	Cal-IntPosSh...
2017-05-17T06:07:25-04:00	Auto Cal	Cal-IntPosLon...
2017-05-17T06:07:25-04:00	File Save	CAL01259.sca
2017-05-17T06:07:25-04:00	History Log	Lamp Off
2017-05-17T06:37:31-04:00	History Log	Lamp On
2017-05-17T06:37:31-04:00	Warning	Starting Lam...
2017-05-17T06:37:39-04:00	Log On	admin, 4, 0
2017-05-17T06:37:40-04:00	Warning	Starting Lam...

Statistics

Itemiser Statistics
 Serial #: 240010
 Date Range: 05/01/2017 12:00:00 AM - 05/17/2017 11:59:59 PM
 Total Time: 16 day(s) 6 hr(s): 39 min(s)
 System On Time: 20 day(s) 16 hr(s): 15 min(s)
 Logged On Time: 0 day(s) 8 hr(s): 31 min(s)

Date and Time Period

From: 05/01/2017 12:00:00 AM
 Through: 05/17/2017 11:59:59 PM

Display Events

- ☒ Alarm
- ☒ Auto Cal
- ☒ Device On
- ☒ Exit ITMS
- ☒ Failed Log On
- ☒ File Save
- ☒ History Log
- ☒ Log Off

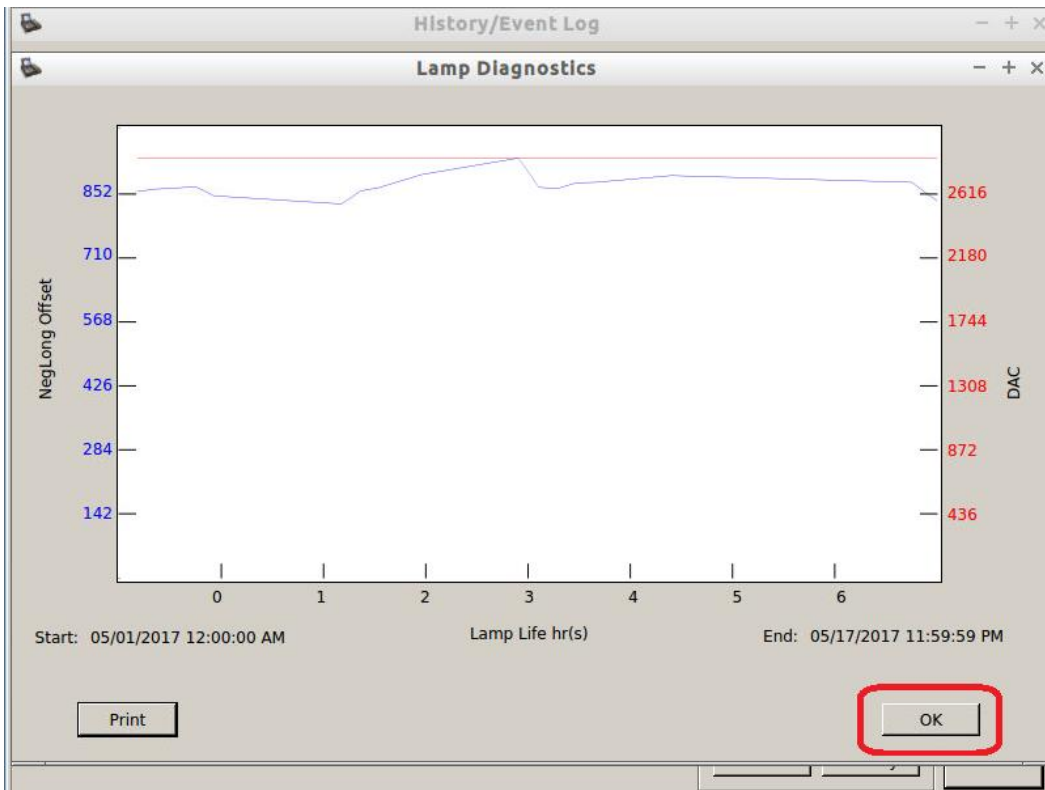
Miscellaneous

Export History/Data
 Purge History
 Add Maintenance Log
 Lamp Diagnostics

Print

Statistics History Close

The screen displays a graphical representation of the lamp offsets for the period you specified:



9. (Optional) Press **Print** to print a copy of the display.

10. Press **OK**.

The screen displays the *History/Event Log* window.

11. Press **Close**.

The screen displays the main window.

This completes the procedure.

Internal Calibrate

The Itemiser® 4DX automatically performs the internal calibration according to a schedule stored in the device. You can also direct the device to perform an internal calibration at any time.

The device performs an internal calibration according to the following schedule:

- 5 minutes since the last trigger
- 1 hour since the software was started (or restarted)
- 2 hours since the last successful calibration (any type)
- 1 hour since the last failed attempt
- 5 minutes since the last dryer switch

If the automatic internal calibration fails, the device logs this event into the history file.

If the device cannot successfully perform a calibration for 8 hours, it displays the *Calibration Warning* message. If you see this message, discontinue use of the device and perform an external calibration to correct the failures ([see "External Calibrate" on page 89](#)).

You can also direct the device to perform an internal calibration at any time.

To perform an internal calibration:

1. Press **Menu** → **Internal Calibrate**.

The screen displays a message to ask if you want to perform an internal calibration.

2. Press **Yes**.

The status bar displays the *Sampling* message to indicate that the device is performing the internal calibration procedure.

When the device has completed the calibration procedure, the screen displays a message that the internal calibration was successful.

3. Press **OK**.

The screen displays the main window.

If the screen displays a message that indicates the calibration process failed, perform either of the following:

- Repeat the internal calibration procedure.
- Perform the external calibration procedure ([see "External Calibrate" on page 89](#)).

This completes the procedure.

Internal Calibration Check

Press the **Internal Calibration Check** button to verify the device calibration settings:

1. Press **Menu** → **Internal Calibration Check**.

The device performs the internal calibration check, and then displays a message that informs you of the result.

2. Press **OK**.

The screen displays the main window.

This completes the procedure.

Only users at the maintenance and administrator levels have access to this function.

Live Mode

Use the **Live Mode** button to display the real-time status of the detector on the plasmagram in red. Only users at the maintenance and administrator levels have access to this function.

To view the status of the detector in live mode:

1. Verify that the device is in the plasmagram view.
2. Press **Menu → Live Mode**.

The screen shows the real-time status of the detector in red.



3. To exit live mode, press **Menu → Live Mode** again.

The screen displays the standard plasmagram view.

This completes the procedure.

Log Maintenance

Press the **Log Maintenance** button to document maintenance you have performed.

Always log every maintenance procedure you perform. This greatly assists field service technicians in diagnosing and solving problems.

To log a maintenance procedure:

1. Press **Menu → Log Maintenance**.

The screen displays the Log Maintenance window.

2. Select all check boxes that apply.

Note that if you check the **Replaced lamp** check box, you must enter the serial number of the new lamp in the accompanying field.

3. (Optional) Add a note in either text field (or both).
4. Press **Save**:

The screen displays the main window.

This completes the procedure.

Manual Calibrate

When the Itemiser® 4DX displays the *Calibration Warning* message, the first step is to perform an external calibration.

If this does not resolve this warning, you must perform a manual calibration.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

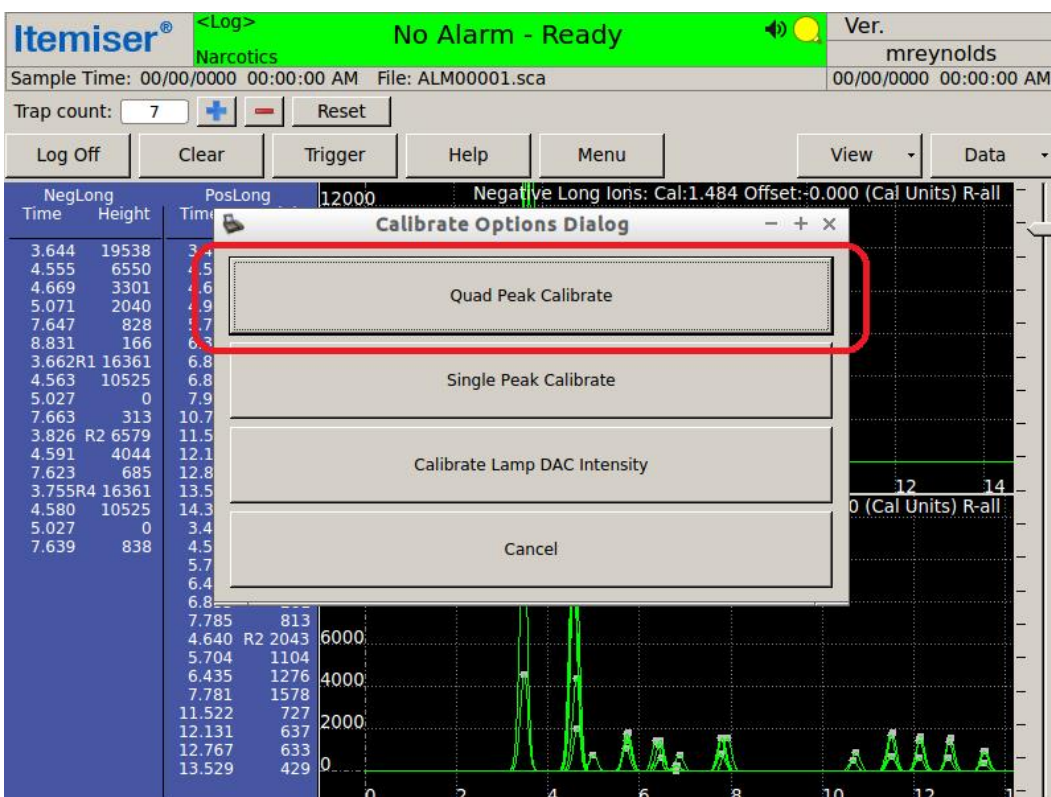
Contact Rapiscan Systems technical support for assistance.

To perform a manual calibration:

1. Press **Menu → Manual Calibrate**.

For supervisor-level users, the screen displays the *Insert cal trap then select peak* message. Skip to step 5.

For maintenance- and administrator-level users, the screen displays the **Calibrate Options Dialog** window. Continue with step 2.

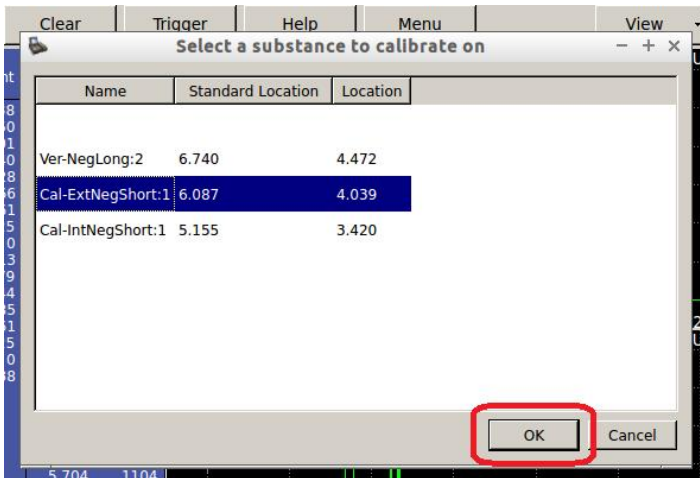
2. Press **Quad Peak Calibrate**:

The screen displays the *Select a substance to calibrate on* window.

**NOTE**

Information has been removed from the following screen images in order to maintain the security of the device.

3. Select **Cal-ExtNegShort** from the list of substances (if it is not already selected).

4. Press **OK**:

The screen displays the *Insert cal trap then select peak* window.

5. Put on clean, powder-free gloves.
6. Remove a calibration trap from the package.
7. Close the package cover immediately.

**IMPORTANT**

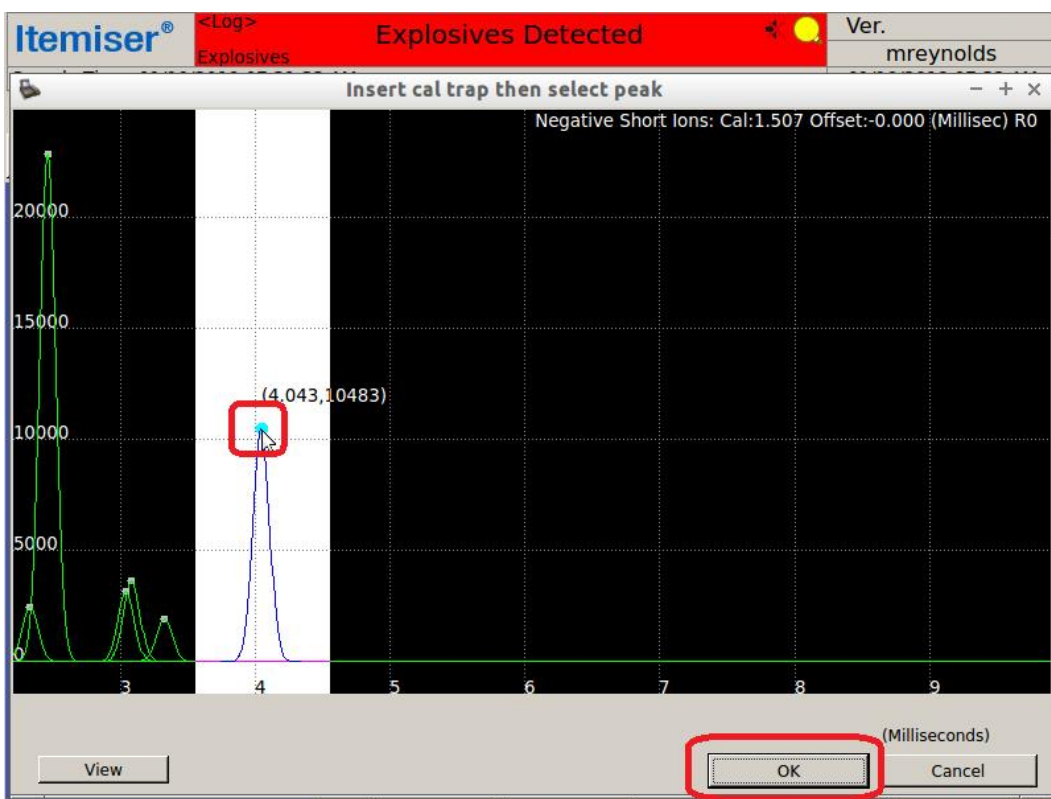
Never touch the sample area of a calibration or verification trap, or allow it to come into contact with any other object or surface.
The test substance on the trap can contaminate any surface, and cause a false indication of the presence of explosives.

8. Insert the trap into the desorber slot.
The screen displays the *Sampling* message.
9. When the screen displays the *Please Remove Sample* message, remove the calibration trap and discard it immediately.
The screen then displays the *Insert cal trap then select peak* window for negative short ions.
10. Touch the purple dot at the top of the tallest peak that is inside the white vertical bar.
The dot turns teal.

**IMPORTANT**

If there is no peak inside the white vertical bar, or if the peak is not prominent, contact Rapiscan Systems technical support immediately ([see "Technical Support" on page 234](#)). These conditions indicate that the device has been improperly calibrated, or is malfunctioning.

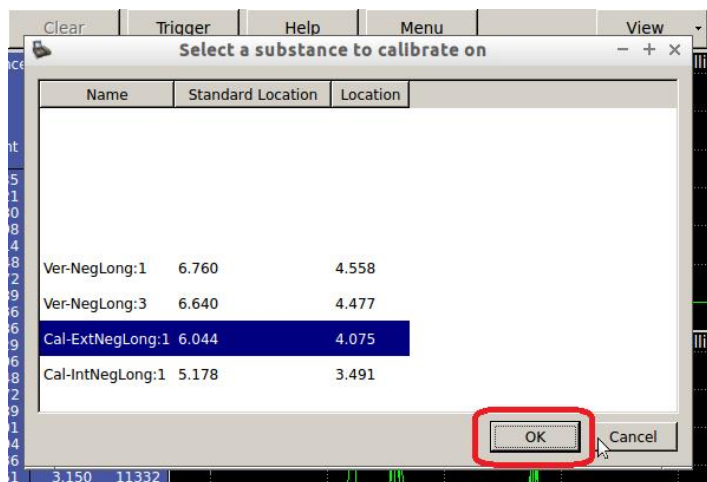
11. Press OK:



The screen displays the *Select a substance to calibrate on* window.

12. Select **Cal-ExtNegLong** from the list of substances (if it is not already selected).

13. Press OK:



The screen displays the *Select the correct peak to calibrate on* window for negative long ions.

14. Touch the purple dot at the top of the tallest peak that is inside the white vertical bar.

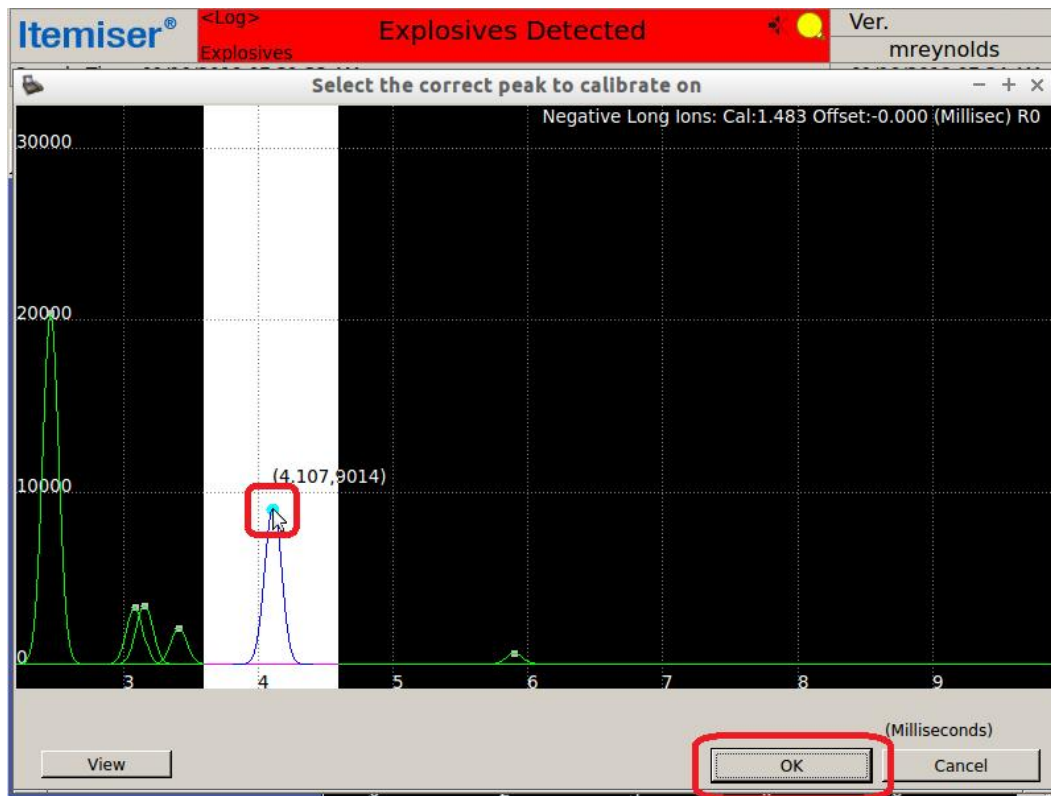
The dot turns teal.



IMPORTANT

If there is no peak inside the white vertical bar, or if the peak is not prominent, contact Rapiscan Systems technical support immediately ([see "Technical Support" on page 234](#)). These conditions indicate that the device has been improperly calibrated, or is malfunctioning.

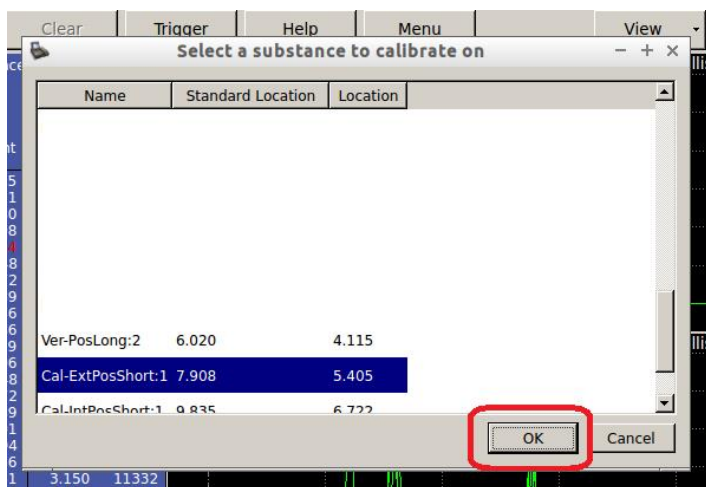
15. Press OK.



The screen displays the *Select a substance to calibrate on* window for positive short ions.

16. Select **Cal-ExtPosShort** from the list of substances.

17. Press **OK**:



The screen displays the *Select the correct peak to calibrate on* window for positive short ions.

18. Touch the purple dot at the top of the tallest peak that is inside the white vertical bar.

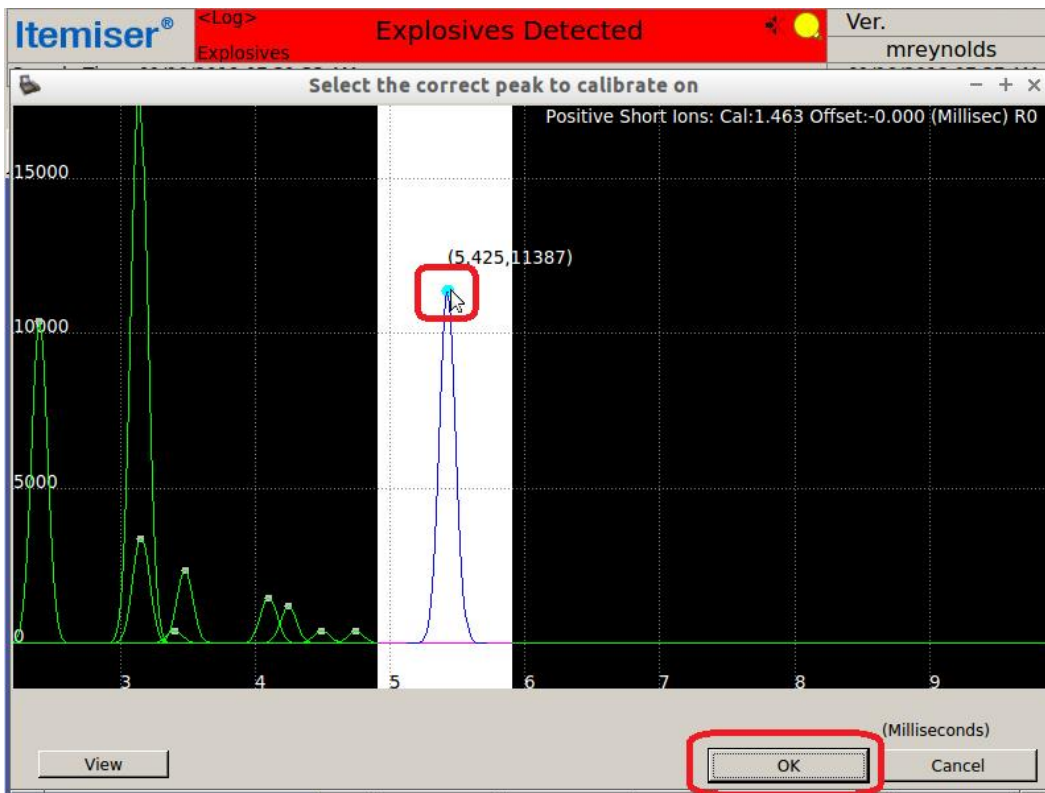
The dot turns teal.



IMPORTANT

If there is no peak inside the white vertical bar, or if the peak is not prominent, contact Rapiscan Systems technical support immediately ([see "Technical Support" on page 234](#)). These conditions indicate that the device has been improperly calibrated, or is malfunctioning.

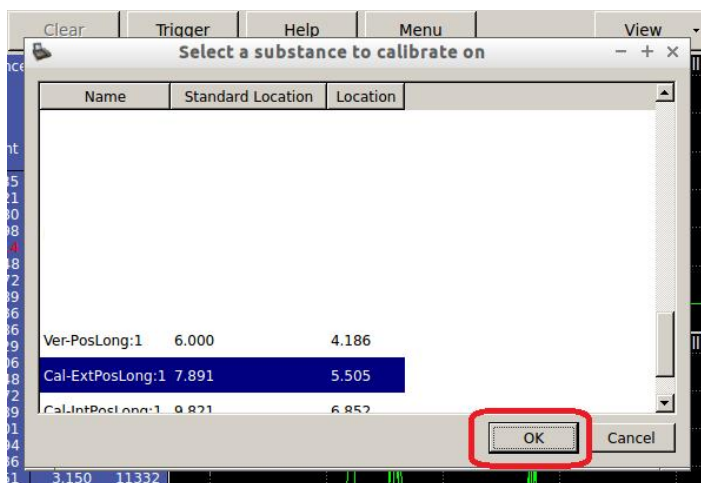
19. Press **OK**.



The screen displays the *Select a substance to calibrate on* window for positive long ions.

20. Select **Cal-ExtPosLong** from the list of substances.

21. Press **OK**:



The screen displays the *Select the correct peak to calibrate on* window for positive long ions.

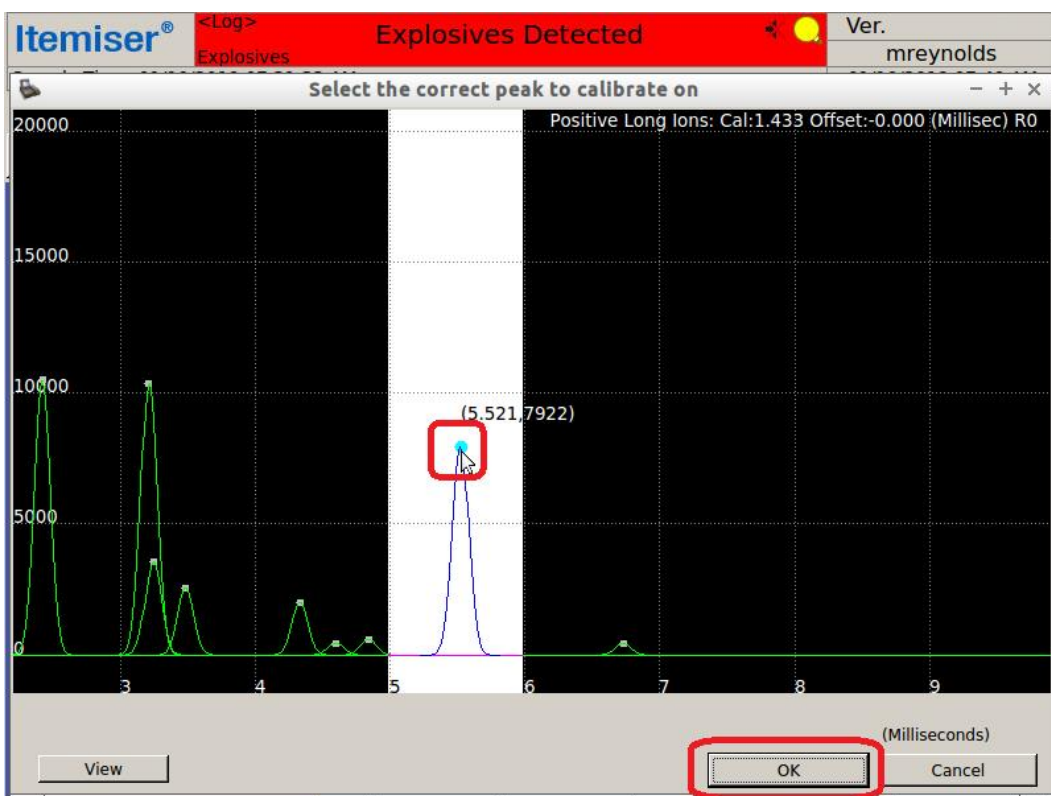
22. Touch the purple dot at the top of the tallest peak that is inside the white vertical bar.

The dot turns teal.

**IMPORTANT**

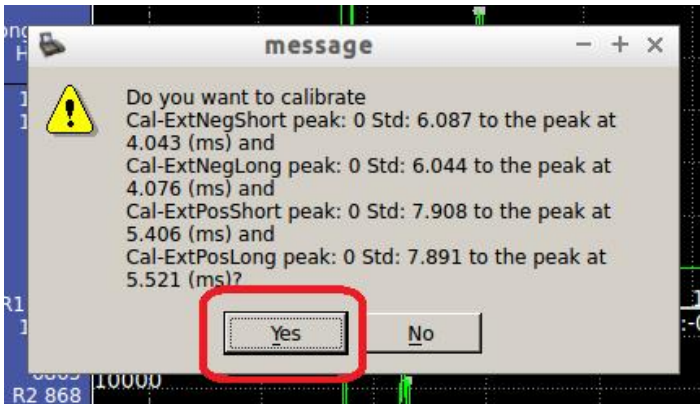
If there is no peak inside the white vertical bar, or if the peak is not prominent, contact Rapiscan Systems technical support immediately ([see "Technical Support" on page 234](#)). These conditions indicate that the device has been improperly calibrated, or is malfunctioning.

23. Press OK:



The screen displays a message that asks you to confirm the calibration.

24. Press **Yes**:



The screen displays the *Device Calibrated* message.

25. Press **OK**.

26. Press **Clear**.

The screen displays the *Clearing* message, and then displays the *Insert Clean Trap* message.

27. Put on clean, powder-free gloves.

28. Carefully remove another sample trap from the package.

29. Close the package cover immediately.

30. Insert the trap into the desorber

31. When the screen displays the *Please Remove Sample* message, remove the trap.

After a brief delay, the screen displays one of two messages:

- If the screen displays the *Insert Clean Trap* message again, repeat steps 30 and 31.
- If the screen displays the *No Alarm - Ready* message, the device is ready.

32. (Optional) Verify the calibration ([see "Verify" on page 171](#)).

This completes the procedure.

Single-Peak Calibration

Under certain circumstances, maintenance staff perform the single-peak calibration procedure.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

Contact Rapiscan Systems technical support for assistance.

The single-peak calibration routine operates in much the same way as the quad-peak calibration, except that it displays only one screen for substance selection. This ability is useful in certain circumstances, but has the potential to calibrate the device incorrectly and degrade its detection ability.

Options

Use the **Options** button to configure settings that affect the display, calibration, auto save, auto print, and other functions.

Changes to the *Options* settings do not affect detection.

Only users at the maintenance and administrator levels have access to this function.

To change options:

1. Press **Menu** → **Options**.

The screen displays *Page 1* of the *Options* window.

2. Change the option you want (refer to the following tables).
3. Press **OK** to save your changes, or press **Cancel** to revoke them.

The screen displays the main window.

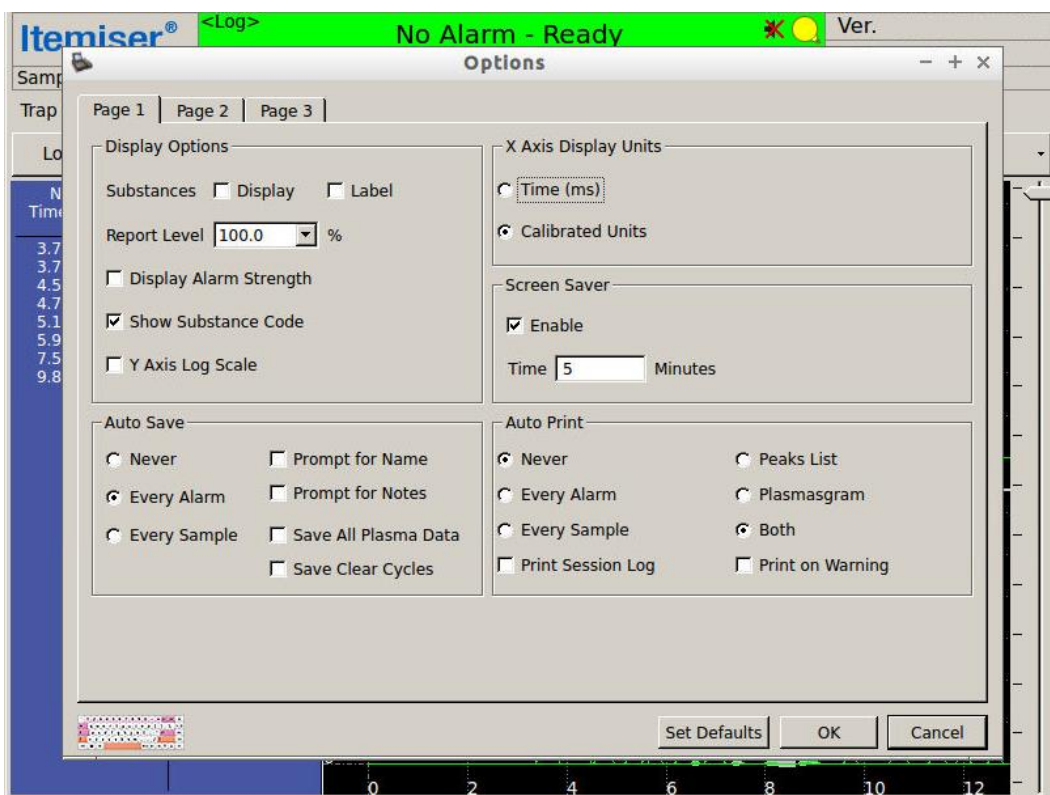


Table 3-9 Options Page 1 functions

Function	Description
Display Options	Modifies the default <i>Plasmagram</i> view to show additional information for the peaks detected. Use the <i>Display Options</i> settings to enable or disable additional information.
• Substances	Select the Display check box to display peaks, select the Label check box to label the peaks, or select both.
• Report Level	Sets the percentage of programmed alarm level required before a substance is identified and displayed as an alarm.
• Display Alarm Strength	Select this box to display the strength of the detected substance in the list view. Clear this box to display only <i>Detected</i> if the device detects a substance.
• Show Substance Code	Select this box to use a letter and number code in place of the substance abbreviation. Clear this box to display only the abbreviated names of the substances.
• Y-Axis Log Scale	Select this box to changes the Y-axis scale of the plasmagram view to a logarithmic scale.
X-Axis Display Units	Selects the units used for X-axis in the plasmagram view: <i>Time (ms)</i> or <i>Calibrated Units</i> . You can select only one.
Screen Saver	Configures the screen saver. Enter the time interval (in minutes) in the Time field to specify when the device activates the screen saver.

Function	Description
Auto Save	Specifies when the device saves data: <i>Never</i>, <i>Every Alarm</i>, <i>Every Sample</i>. You can select only one button. Check the boxes if the device should <i>Prompt for Name</i> and/or <i>Prompt for Notes</i> when automatically saving data when the <i>Every Alarm</i> and <i>Every Sample</i> options are selected. You can select both boxes for each of the two options. Check the <i>Save all Plasma Data</i> box to save all plasmagram data and re-detect peaks to be saved. This increases the data, alarm, and calibration file sizes. Check the <i>Save Clear Cycles</i> box to save all information on clearing cycles.
Auto Print	Specifies when the device automatically prints: Never, Every Alarm, Every Sample. You can select only one button. Select the Print Session Log check box to direct the device to print a complete log of date and time, event type, user, mode, serial number, number of samples and sample type taken, saved files, and warnings. Select the Peaks List, Plasmagram, or Both button to include the peaks list, a representation of the plasmagram display, or both in all print-outs. Select the Print on Warning button to initiate a print-out whenever the device displays a warning message.
Set Defaults	Resets the settings back to factory defaults for all three <i>Options</i> pages.

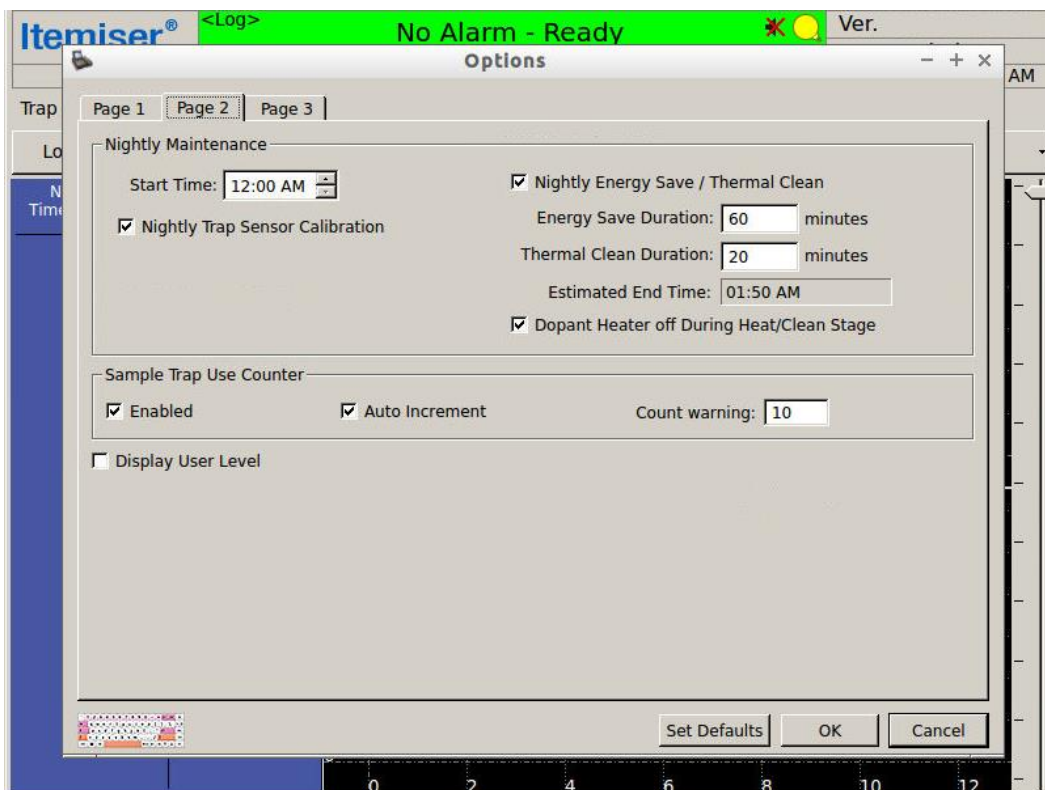


Table 3-10 *Options Page 2 functions*

Function	Description
Nightly Maintenance	Sets the intervals and activities that the device performs as part of its nightly maintenance procedure. This includes purging old data and logging lamp data as well as the other activities specifically listed in this pane.
Start Time	Select the time that you want nightly maintenance to begin (the default value is 12:00 AM).
Nightly Trap Sensor Calibration	Select this check box to calibrate the trap sensor as part of the nightly maintenance procedure (this check box is selected by default).
Nightly Energy Save/Thermal Clean	Select this check box to perform a thermal clean as part of the nightly maintenance procedure, and to have the device then enter energy-saving mode (this check box is selected by default). - Enter the duration of the energy-saving mode in the Energy Save Duration field (the default value is 60 minutes). - Enter the duration of the thermal clean in the Thermal Clean Duration field (the default value is 20 minutes). The Estimated End Time field displays the time that the nightly energy save/thermal clean ends, and the device is ready for use. Note that the device displays the <i>Energy Saving</i> message in the status bar when it is in the energy-save mode.
Dopant Heater off During Heat/Clean Stage	Select this check box to turn the dopant heater off during the thermal clean (this check box is selected by default). This saves energy and increases dopant lifetime.
Sample Trap Use Counter	Controls the display and operation of the sample trap counter displayed on the main window.
Enabled	Select this check box to display the sample trap counter (this check box is selected by default).
Auto Increment	Select this check box to increase the number displayed in the sample trap counter each time a trap is inserted into the desorber slot (this check box is selected by default).
Count warning	Specify when the sample trap counter enters its warning mode; when the specified number of traps have been inserted, the sample trap counter field turns yellow as a warning to the operator (the default value is 10).
Display User Level	Select this check box to display the user level as well as the user name on the main window. This also adds the user level to data files and the <i>Config/Notes</i> window (note that the Config/Notes window displays the user name and level of the user who was logged in at the time of the last sample; this user might or might not be the same user who is currently logged in to the system),
Set Defaults	Resets the settings back to factory defaults for all three <i>Options</i> pages.



NOTE

For maximum energy savings in the nightly maintenance procedure, enter the time that the last shift of the day finishes in the **Start Time** field, and increase the time in the **Energy Save** field until the time displayed in the **Estimated End Time** field is just before the first shift of the day.

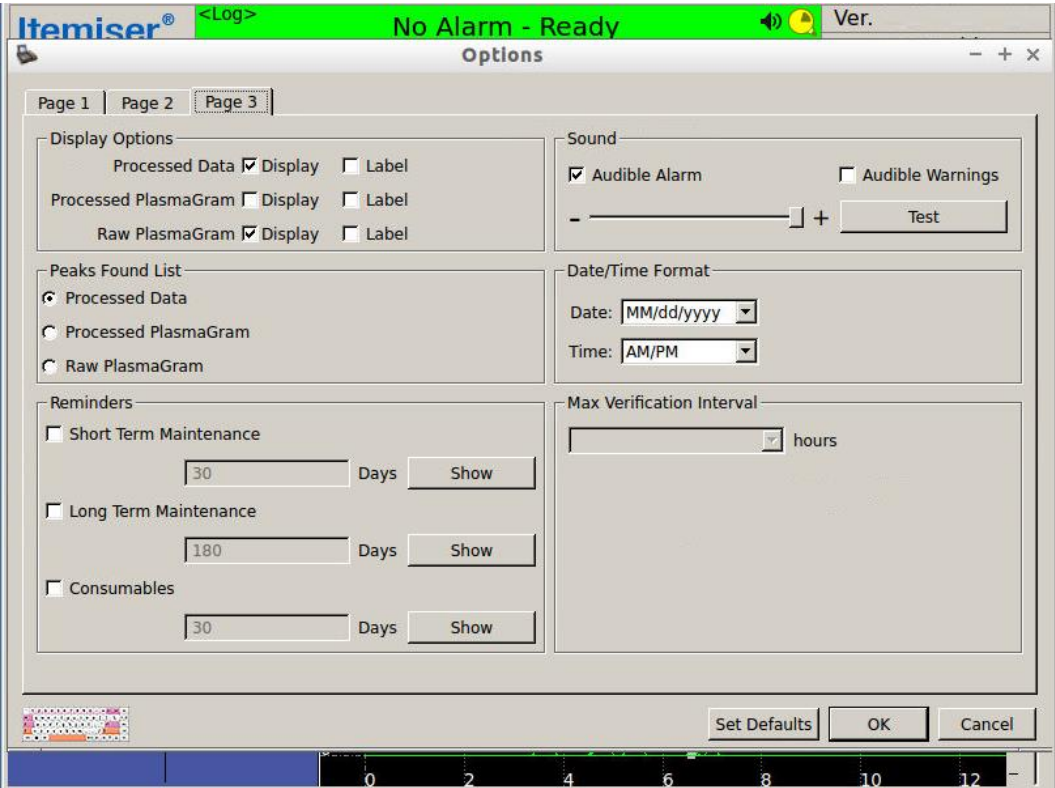


Table 3-11 Options Page 3 functions

Function	Description
Display Options	Use the Display Options check boxes to modify the plasmagram view to show additional information for the peaks detected.
• Processed Data	The single plasmagram results from a sampling analysis.
• Processed Plasmagram	There are 120 processed plasmagrams collected in each of 4 ion modes during an 8-second sampling analysis (15 plasmagrams per second in each ion mode). This option allows you to view each plasmagram separately by moving a scroll bar on the right side of the screen
• Raw Plasmagram	This is the <i>raw</i> plasmagram data before it is transformed into <i>processed</i> plasmagram data.
• Display	Select this check box to display a graphic representation of the Processed Data, Processed Plasmagram, or Raw Plasmagram data.

Function	Description
• Label	Select this check box to add peak labels to the graphic representation of the Processed Data, Processed Plasmagram, or Raw Plasmagram data graphically (this check box displays the peak labels only if the Display check box is also selected).
Peaks Found List	The left side of the screen in the plasmagram view shows a list of peak locations by time and height, and in some cases shows the substance(s) detected. If a peak is highlighted on the plasmagram, the location of the peak appears in red in the peaks found list. You can select only one of these options: <i>Processed Data</i> , <i>Processed Plasmagram</i> , or <i>Raw Plasmagram</i> .
Reminders	Activates the short-term, long-term, and consumables maintenance reminders, and sets the number of days for each reminder. Press the Show button to display and print the maintenance reminder.
Sound	Turns the Audible Alarm and Audible Warnings features on and off. Also controls the duration of the audible alarm. Note that you can also control this function using the Sound Indicator on the main window (see " Sound Indicator " on page 50).
• Audio Alarm	Select this check box to sound an alarm whenever the device detects a prohibited substance.
• Audio Warning	Select this check box to sound an alarm whenever the device enters a warning state.
• Volume control slider	Use this control to control the volume of the sound the device produces: • Move the slider bar to the left (toward the minus sign) for quieter sound. • Move the slider bar to the right (toward the plus sign) for louder sound.
• Test	Press this button to sound the alarm that you selected.
Date/Time Format	Sets the date and time format to be displayed on print-outs and reports.
Set Default	Resets the settings back to factory defaults for all three <i>Options</i> pages.

Password/Security Policy

The Password/Security Policy function sets the requirements for password, password age, password complexity, user name, and account locks. It also enables the auto-log-off feature.

To change password options:

1. Press **Menu** → **Advanced Menu**.
2. Press **Password/Security Policy**.

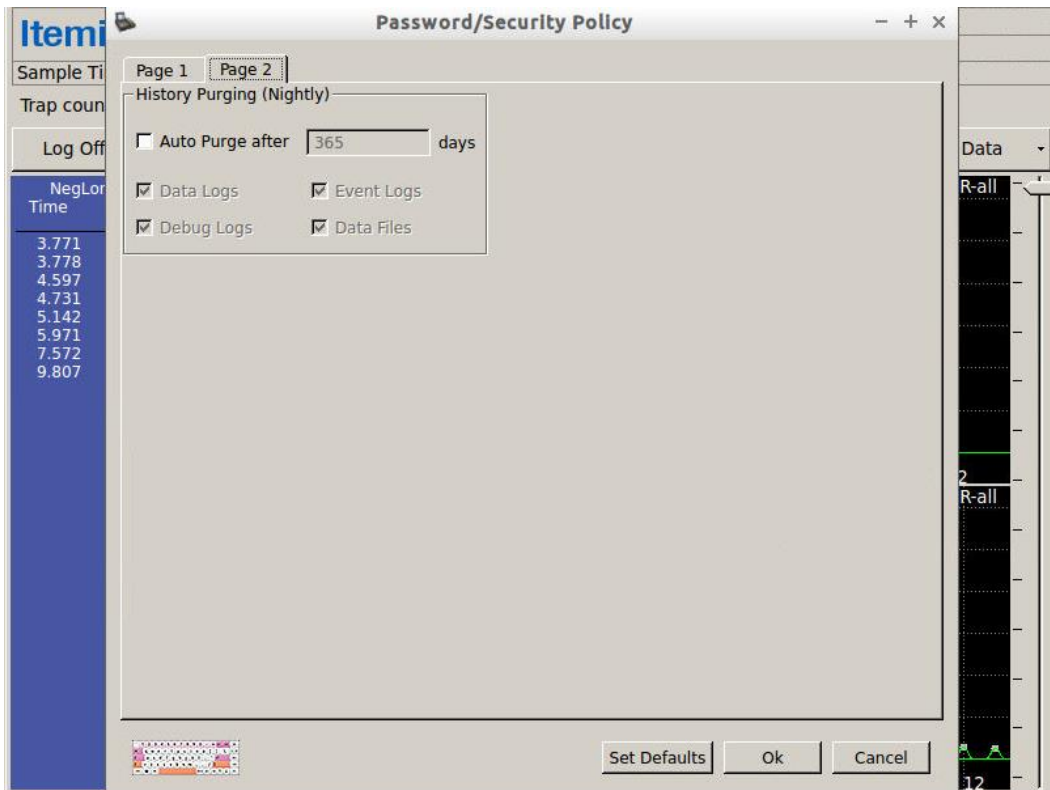
The screen displays page 1 of the *Password/Security Policy* window:

The screenshot shows the 'Password/Security Policy' window with 'Page 1' selected. The window is divided into several sections with various input fields and checkboxes.

- Password Section:**
 - Minimum Length: 5
 - Maximum length: 16
 - ☒ Don't allow old passwords
 - Password history size: 10
- Password Age Section:**
 - ☐ Enable
 - Minimum Age: 1 days
 - Maximum Age: 180 days
- Password Complexity Section:**
 - Minimum lower case characters: 1
 - Minimum upper case characters: 0
 - Minimum numeric characters: 1
 - Minimum special characters: 0
- User Name Section:**
 - Minimum Length: 2
 - Maximum Length: 30
- Log On Section:**
 - Lock account after 3 failed logons
 - Lock timeout: 60 minutes
 - Max maint level users: 100
 - ☐ Disable Shutdown from Logon screen
 - ☐ Disable Super User Access
- Auto Log Off Section:**
 - ☒ Enable
 - Log off after 60 minutes of inactivity

At the bottom right, there are three buttons: 'Set Defaults', 'Ok', and 'Cancel'.

- Press **Page 2** to display the second page of the *Password/Security Policy* window.



- Modify the parameters as necessary (refer to the following tables for additional information).
- (Optional) To return to the original default values, press **Set Defaults**.
- Press **Ok**.

The screen displays the main window.

This completes the procedure.

Table 3-12 *Password/Security Policy Page 1 functions*

Function	Description
Password	Specifies password and history parameters.
• Minimum Length	Enter the minimum number of characters required for a password (the default value is 5).
• Maximum length	Enter the maximum number of characters allowed for a password (the default value is 16).
• Don't allow old passwords	Select this check box to prevent the use of old passwords (this box is selected, by default).
• Password history size	The number of old passwords prohibited; for example, if this value is 10 (the default value), the 10 most recent passwords cannot be re-used.
Password Age	Specifies the allowable age of the password.

Function	Description
• Enable	Activates the password age feature (this check box is cleared, by default).
• Minimum Age	Enter the minimum age required for any password (the default value is 1 day).
• Maximum Age	Enter the maximum age allowed for any password (the default value is 180 days).
Password Complexity	Specifies password complexity.
• Minimum lower case characters	Enter the minimum number of lower-case characters that any password must include (the default value is 1).
• Minimum upper case characters	Enter the minimum number of upper-case characters that any password must include (the default value is 0).
• Minimum numeric characters	Enter the minimum number of numeric characters that any password must include (the default value is 1).
• Minimum special characters	Enter the minimum number of special characters that any password must include (the default value is 0). Special characters include ! @ # \$ % ^ & * (the top row of the standard keyboard, in Shift mode).
User Name	Specifies user name parameters.
• Minimum Length	Enter the minimum number of characters required for a user name (the default value is 2).
• Maximum Length	Enter the maximum number of characters allowed for a password (the default value is 30).
Log On	Specifies user name parameters.
• Lock account after <i>n</i> failed logons	Enter the maximum number of consecutive failed log-on attempts allowed before the account is locked out (the default value is 3 attempts).
• Lock timeout	Enter the amount of time the account is locked out (the default value is 60 minutes).
• Max maint level users	Enter the maximum number of maintenance-level users allowed in the device database (the default value is 100).
• Disable Shutdown from Logon screen	Select this check box to prevent users from shutting down the device from the <i>User Log On...</i> window (this check box is cleared, by default).
• Disable Super User Access	Select this check box to prevent super-user-level access to the device (this check box is cleared, by default).
Auto Log Off	Specifies the use and operation of the automatic log-off feature.
• Enable	Select this check box to activate the automatic log-off feature (this check box is selected, by default).
• Log off after <i>n</i> minutes of inactivity	Enter the number of minutes that the device can be idle before it automatically logs off the current user (the default value is 60 minutes).
Set Defaults	Resets the settings back to factory defaults for both <i>Password/Security Policy</i> pages.

Table 3-13 *Password/Security Policy Page 2 functions*

Function	Description
History Purging (Nightly)	Specifies when system data is purged.
Auto Purge after <i>n</i> days	Select this check box to enable the automatic purging of data (this check box is cleared, by default). Enter the number of days after which the device purges data (the default value is 365).
Data Logs	Select this check box to include data logs in the automatic purging (this box is selected by default).
Debug Logs	Select this check box to include debug logs in the automatic purging (this box is selected by default).
Event Logs	Select this check box to include event logs in the automatic purging (this box is selected by default).
Data Files	Select this check box to include data files in the automatic purging (this box is selected by default).
Set Defaults	Resets the settings back to factory defaults for both <i>Password/Security Policy</i> pages.

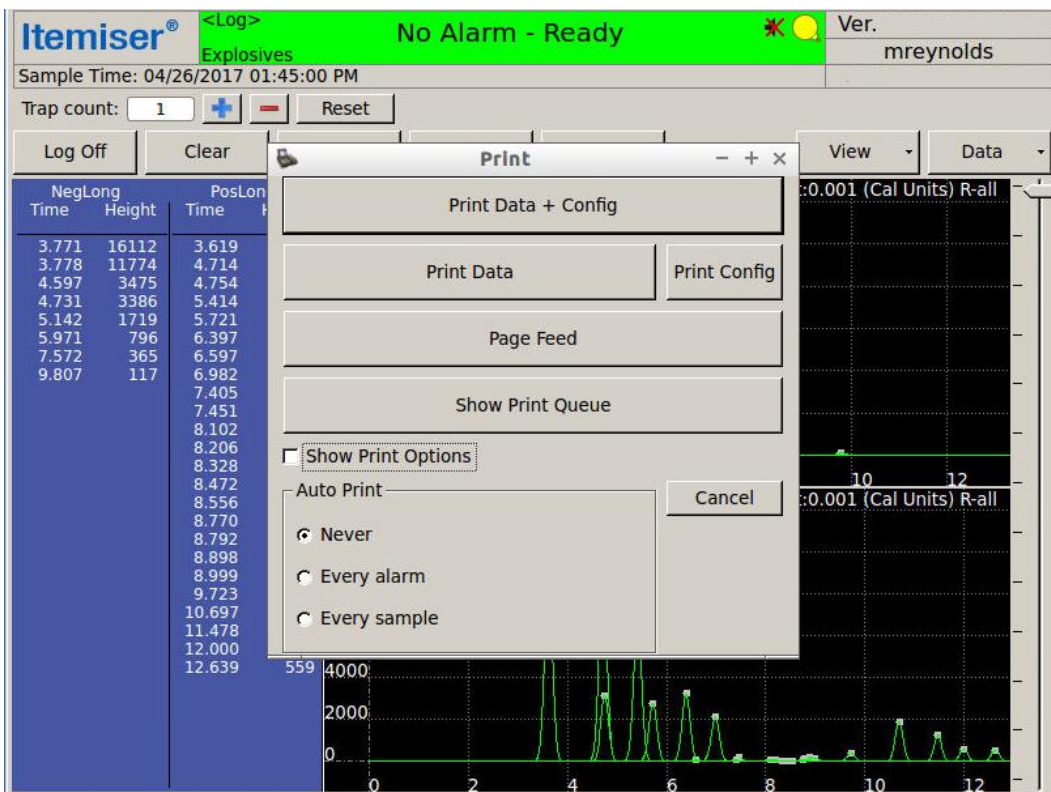


CAUTION Once you have purged data, debug, event, or data logs, you cannot recover them.

Print

Use the **Print** button to print information from the device:

1. Press **Menu** → **Print**.
The screen displays the *Print* options window.
2. Press the print option you want (refer to the following table):



3. Remove the print-out from the printer slot.



IMPORTANT

Due to the characteristics of thermal printer paper, anything printed on it fades over time, or when exposed to heat. If you need to maintain anything printed by the integral printer, scan or copy it as soon as possible.

Table 3-14 *Print Options*

Features	Description
Print Data and Config	Press this button to print the plasmagram with peaks, peaks found list, any substances detected, and the device and substance configuration.
Print Data	Press this button to print the plasmagram with peaks, peaks found list, and any substances detected.
Print Config	Press this button to print the device and substance configuration.
Page Feed	Press this button to advance the paper from the paper roll.
Show Print Queue	Displays the print queue and lets you refresh it.
Show Print Options	Displays a printer settings menu when you select this check box and then press any print option. You can use this menu to select either a USB printer or the built-in thermal printer. The built-in thermal printer name is <i>APS-CP305MRS</i> .
Auto Print	Controls the automatic printing of device events (you can select only one of the following three options).
• Never	Select this option to prevent any automatic printing of device events (this option is selected, by default).
• Every alarm	Select this option to print a record of every alarm.
• Every sample	Select this option to print a record of every sample.
Cancel	Closes the <i>Print</i> options window.

Random Search Generator

Use the **Random Search Generator** button to define search methods and direct screeners to perform them randomly, based on a percentage setting.

For example, you might want screeners to perform searches according to the following schedule:

- Search the outside of baggage 40% of the time
- Search the inside of baggage 20% of the time
- Search both the inside and outside of the baggage 10% of the time
- Search an electronic device 10% of the time
- Perform no search at all 20% of the time

You can set these types of checks and their associated percentages using the random search generator function. Each time screeners have a subject, they press the **Inspect** button; the device then randomly instructs them to perform one of the types of searches you entered.

Only users at the supervisor, maintenance, and administrator levels have access to this function.

To set up a random search generator:

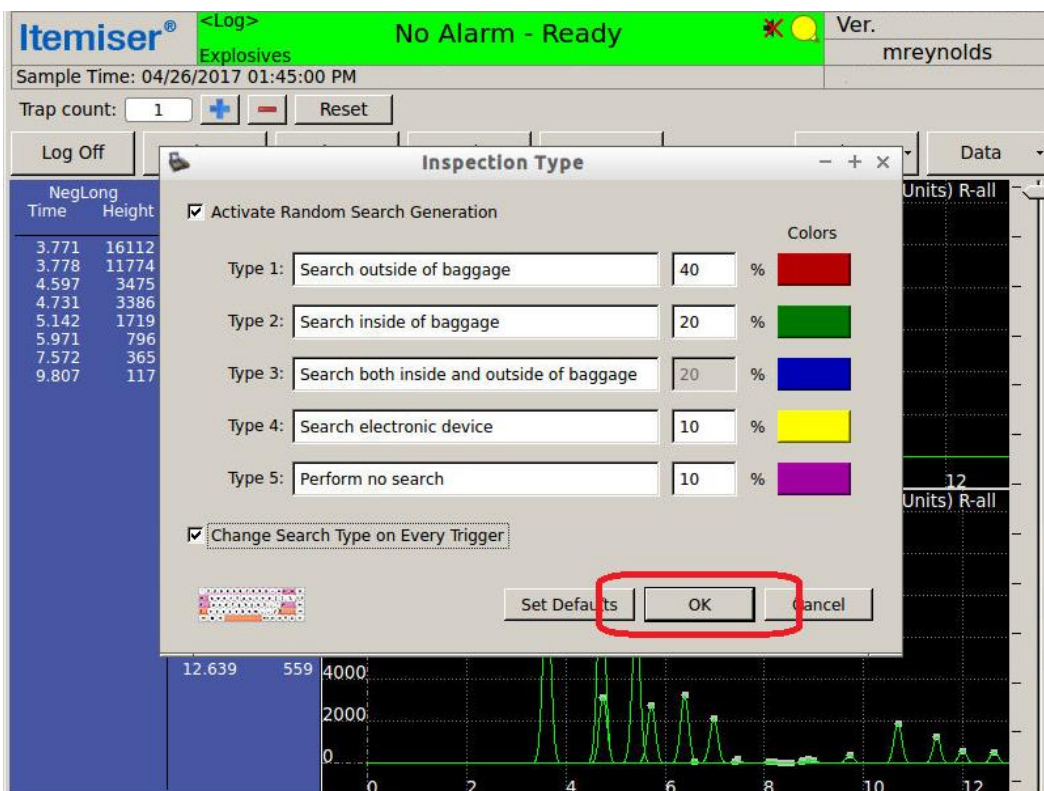
1. Press **Menu** → **Random Search Generator**.

The screen displays the *Inspection Type* window.

2. Check the **Activate Random Search Generation** box.
3. Enter the first type of search and the percentage of time screeners should employ it in the **Type 1** and percentage fields.
4. (Optional) To change the color associated with each type of search (and the color displayed on the main screen), press the color box and choose the color you want.
5. Repeat the previous two steps for each search type you want. Ensure that the total of percentages you enter equals 100%.
6. (Optional) If you want the device to change the type of search each time there is a trigger, select the **Change Search Type on Every Trigger** check box.

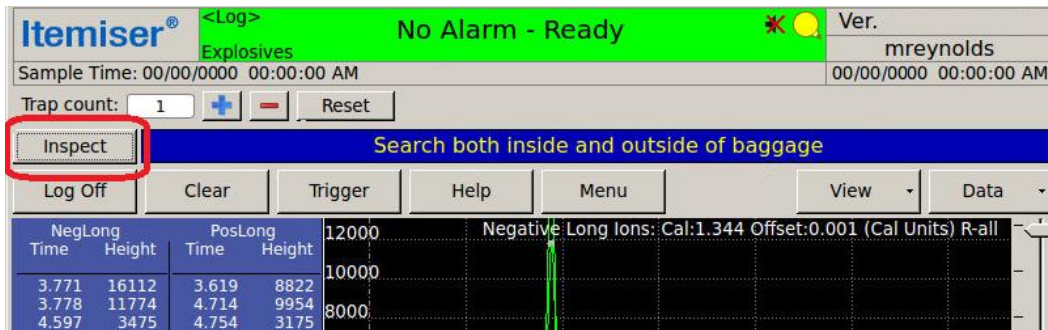
If you do not select this option, the device changes the type of search each time the screener touches the **Inspect** button.

7. Press **OK**:



The device displays the main screen, now with the **Inspect** button.

8. If you did not select the *Change Search Type on every trigger* check box, then each time the screener presses the **Inspect** button, the screen randomly displays a type of search:



9. If you selected the *Change Search Type on every trigger* check box, then the device automatically changes the search type after each analysis of a sample trap.
10. To deactivate the random search generation function, press **Menu** → **Random Search Generator** and clear the **Activate Random Search Generation** check box.

Note that if an alarm is generated while random search generation is activated, the sample type appears in the *Notes* section of the *Config/Notes* details.

This completes the procedure.

Recall

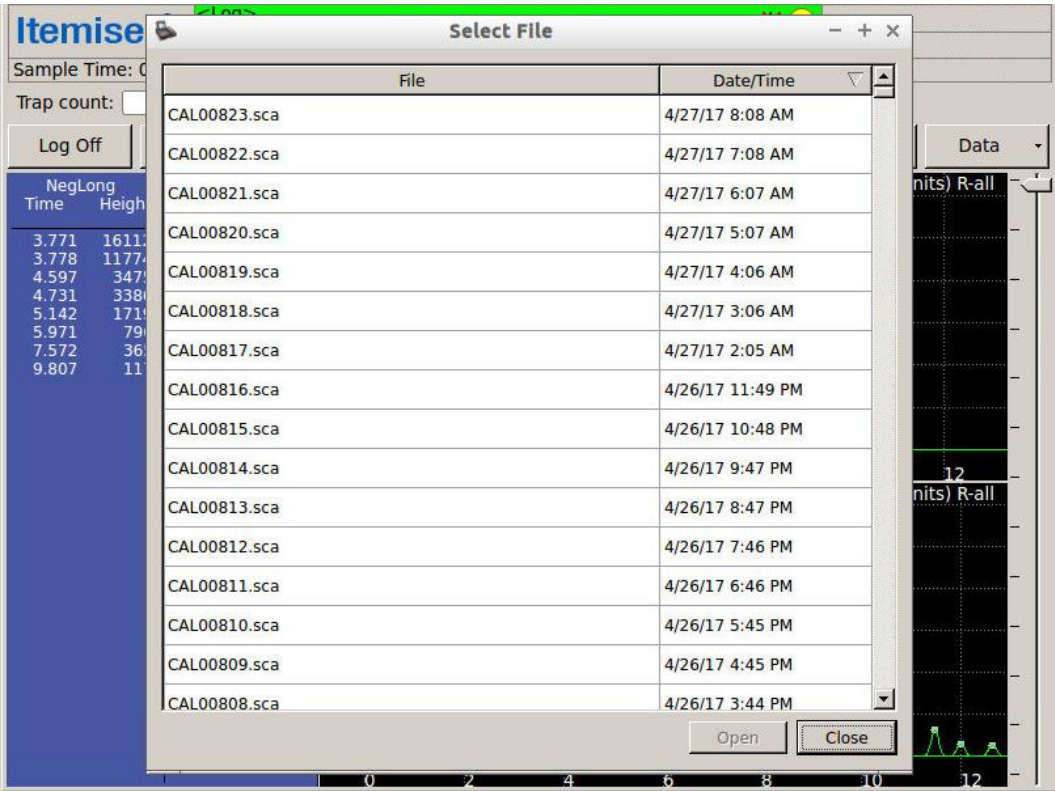
Use the **Recall** button to display the contents of the alarms file folder. You can then select an alarm or other saved file and view it.

Only users at the supervisor, maintenance, and administrator levels have access to this function.

To recall a file:

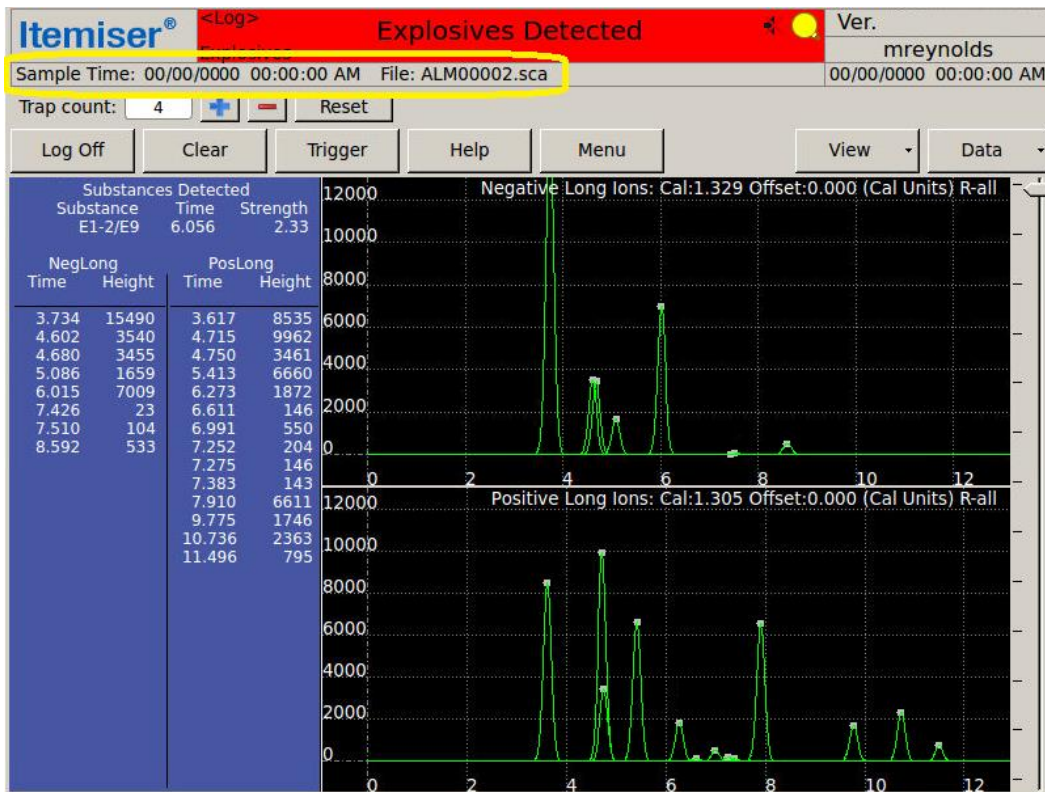
- 1. Press **Menu → Recall**.

The screen displays the *Select File* window:



- Press the file you want to display.

The screen displays recalled alarm files along with a notation in the status bar with the file name and -R along with the date and time it was saved. Note that the user level in which the file was saved is also displayed, and may be different from your user level.



- To scroll through more files from the recalled alarm files folder, press the **G** key on the keyboard.
- Press **Clear** to return to the live display.

Note that clearing a recalled file does not execute a sampling cycle.

This completes the procedure.

Remote Connect Settings

Use the **Remote Connect Settings** button to configure the Itemiser® 4DX to accept a connection from a remote operator.

Refer to the Remote Connect Console User's Guide (MA100100) to install, configure, and run RCC.

Note that you must be an administrator-level user to perform RCC-related procedures.

Restore All Default Settings

Press the **Restore All Default Settings** button to restore the device settings to their original (factory-default) settings. This includes the user database and the detection configuration:

1. Press **Menu** → **Advanced Menu**.
2. Press **Restore All Default Settings**.

The screen displays a window that asks if you are certain that you want to restore all default settings.



CAUTION

If you restore all default settings, this also deletes the current user database and replaces it with the default user database. Once this is done, you cannot recover the original user database.

3. To restore all default settings, press **Yes**.

The screen displays a message that warns you that a new database has been created.

4. Press **OK**.

The screen displays a message that warns you that you must select a new configuration.

Press **OK**.

The screen displays the *Select configuration* window.

5. Select the configuration you want.

6. Press **OK**.

The screen displays the *Log Maintenance* window.

7. Enter a comment indicating that you restored all default settings.

8. Press **Save**.

The screen displays the *User Log On...* window.

This completes the procedure.

Restore Default Config

Use the **Restore Default Config** button to restore the device to its default configuration:

1. Press **Menu** → **Advanced Menu**.
2. Press **Restore Default Config**.

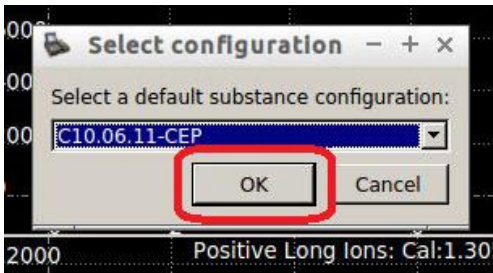
The screen displays the *Select configuration* window.

3. Press the down-arrow.

The screen displays a list of configurations.

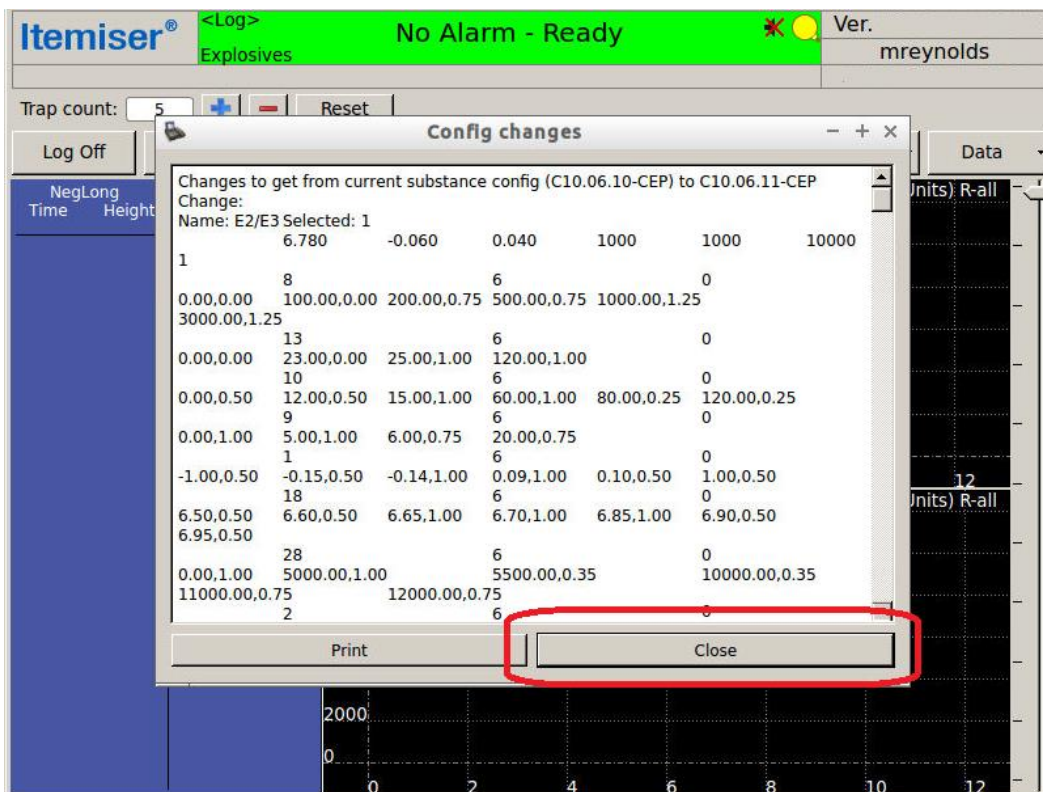
4. Select the configuration you want.

5. Press **OK**:



The screen displays the *Config Changes* window.

6. (Optional) Press **Print** to print a copy of the configuration.
7. Press **Close**:



The screen closes the *Config changes* window and displays a warning message.

8. Press **Yes**.

The device changes the device configuration as you directed.

The screen displays the main window.

This completes the procedure.

Safely Remove USB Hardware

Use the **Safely Remove USB Hardware** button to prepare USB devices for removal from the Itemiser® 4DX.



CAUTION

Always use this function before you remove a USB storage device from the Itemiser® 4DX. If you do not, you might lose or damage the data stored on the USB device.

To safely remove a USB device:

1. Press **Menu** → **Safely Remove USB Hardware**.

The screen displays the *Safely Remove USB Device* window, which lists all the USB devices currently in the Itemiser® 4DX.

2. Press the entry for the USB device you want to remove.
3. Press **Remove**.

The screen displays a message that tells you it is now safe to remove the USB device.

4. Press **OK**.

The screen displays the main window.

5. Remove the USB device.

This completes the procedure.

Save

Press the **Save** button to save an alarm file (or other data file) in the alarms directory.

To save an alarm file:

1. Press **Menu** → **Save**.

The screen displays the *Please enter a file name* message.

2. Type a descriptive file name for the file (the file name can be up to 100 characters in length).

If you do not enter a file name, the device uses a default name (*SIG00001* for non-alarms or *ALM00001* for alarms, in increments of one for each subsequent file saved).

When assigning a file name, do not use the following symbols:

\ / : * ? " ' < > ! () , . \$ & ; ' .

Always use a dash, hyphen (-), or underscore (_) instead of a space.

3. Press **OK**.

The screen displays the *Please Select/Edit Notes* message.

4. (Optional) Type a note about the file (up to 125 characters).
5. (Optional) Check the selection corresponding to the type of material sampled.
6. Press **OK**.

The device saves the file.

The screen displays the main window.

This completes the procedure.

To see saved files, press the **Recall** button ([see "Recall" on page 134](#)).

Set Default Calibration Factors

If you selected peaks outside of the white window during the manual calibration procedure, you must set the default cal factors. This moves each white window to the new peak location, allowing for successful calibration.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

Contact Rapiscan Systems technical support for assistance.

To set default calibration factors:

1. Press **Ctrl+F** on the keyboard. If you are an administrator-level user, you can press **Menu → Advanced Menu → Set Default Calibration Factors**.

The screen displays a message that asks if you want to set the default calibration and pressure values.

2. Press **Yes**.

The screen displays a message that asks if you want to accept the current and new values.

3. Press **Yes**.

4. Perform the internal calibration procedure immediately to ensure that all settings are correct ([see "Internal Calibrate" on page 107](#)).

This completes the procedure.

Set Device Name and Location

This function lets you enter the device's name and location.

This name and location are reflected in the reports produced by Remote Connect Console (RCC) software. To maintain the accuracy of RCC statistics and reports, always use this function when you move the device to a new location

To set the device name and location:

1. Press **Menu** → **Set Device Name and Location**.

The screen displays the *Set device name and location* window.

2. Press the down-arrow in the **Name** field.

The screen displays a list of names.

3. Press the device name you want.

4. Press the down-arrow in the **Location** field.

The screen displays a list of locations.

5. Press the device location you want.

6. Press **OK**.

This completes the procedure.

Set User Privileges

Use the **Set User Privileges** button to add or remove privileges for classes of users (user levels).



NOTE

When you set privileges for a user level, the change affects all users assigned to that level—for example, when you make a change in the operator column, the change affects all operator-level users ([see "User-Level Privileges" on page 160](#)).

To set user privileges:

1. Press **Menu** → **Advanced Menu**.
2. Press **Set User Privileges**.

The screen displays the *User Privileges* window:

Function	operator	supervisor	maintenance	administrator
Users -> Restore default users	☐	☐	☐	☒
Users -> Modify supervisor	☐	☐	☒	☒
Users -> Modify operator	☐	☒	☒	☒
Users -> Modify maintenance	☐	☐	☐	☒
Users -> Modify administrator	☐	☐	☐	☒
Users -> Delete supervisor	☐	☐	☒	☒
Users -> Delete operator	☐	☒	☒	☒
Users -> Delete maintenance	☐	☐	☐	☒
Users -> Delete administrator	☐	☐	☐	☒
Users -> Add supervisor	☐	☐	☒	☒
Users -> Add operator	☐	☒	☒	☒
Users -> Add maintenance	☐	☐	☐	☒
Users -> Add administrator	☐	☐	☐	☒
Menu -> Verify	☐	☒	☒	☒
Menu -> Users View	☒	☒	☒	☒

Buttons at the bottom: Set Defaults, OK, Cancel

The table lists all the menu functions available. Press the down-arrow in the **Function** column heading to sort them alphabetically.

3. Check any check box to assign access to the corresponding function.
4. Clear any check box to remove access to the corresponding function.
Never change the access of administrator-level users.
5. (Optional) To restore the default privileges for all user levels:

- Press the **Set Defaults** button.
 - The screen displays a message that asks if you want to restore the default privileges.
 - Press **Yes**.
6. When you have finished making your changes, press **OK**.

The screen displays the main window.

This completes the procedure.

Show Network Name and IP

Use the **Show Network Name and IP** button to display the host name and IP address of the device:

1. Press **Menu → Advanced Menu**.
2. Press **Show Network Name and IP**.
The screen displays the device name and IP address.
3. To close the window, press **OK**.

The screen displays the main window.

This completes the procedure.

Statistics

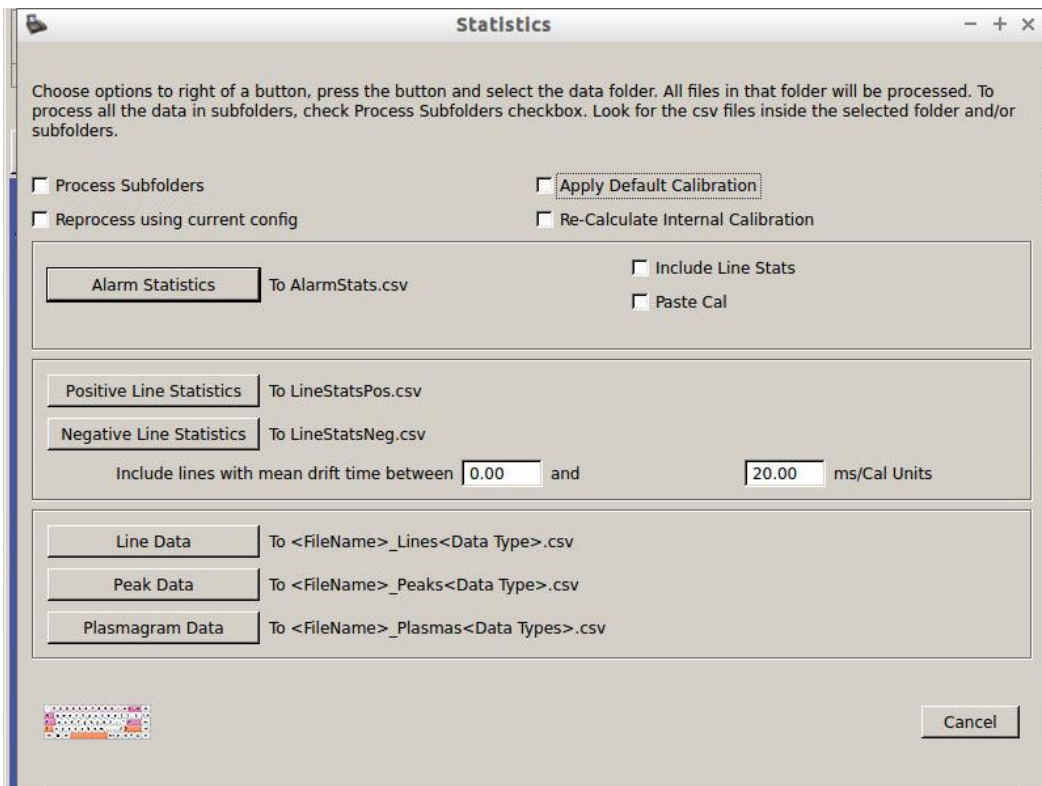
Use the **Statistics** function to export saved ITMS data (.sca) files to CSV (comma separated values) files; you can then open, edit, and save the CSV files using *MS Excel* or other data processing software.

Only users at the administrator level have access to this function.

To export the device statistics:

1. Insert a USB device into one of the USB plugs on the rear of the device.
2. Press **Ctrl** and **t**.

The screen displays the *Statistics* window:



3. Press the button corresponding to the type of statistics you want to export:
 - Alarm statistics
 - Positive line statistics
 - Negative line statistics
 - Line data
 - Peak data
 - Plasmagram data

The screen displays a window that lets you choose the USB device you want to use.

4. Press the directory on the USB storage device.

5. Press **Open**.

The screen displays a message that confirms it has completed the export.

6. Press **OK**.

The device displays the main screen.

7. Press **Menu → Safely Remove USB Hardware**.

The screen displays the *Safely Remove USB* device window.

8. Select the USB device you want to remove.

9. Press **Remove**.

The screen displays the *Remove the USB Device* window.

10. Press **OK**.

The screen displays the main window.

11. Remove the USB device.

This completes the procedure.

Status

The *Status* window displays current and calculated values.

This window is useful for troubleshooting purposes when contacting Rapiscan Systems technical support.

To check the status of the device, press **Menu → Status**.

Name	Value	Name	Value
Last Cal Time	05/26/2017 06:08:03 AM	Remote Connect	Disabled
Last Ver Time	04/27/2017 10:27:54 AM	SSH Server	Enabled
Abs. Pressure	99.664 kPa	External DC	Present
Det. Cal	162.98 °C	DC Voltage	14.55 V
Det. Set	163.00 °C	Main Battery	Ready
Det. raw	163.74 °C	Battery Voltage	16.52 V
Des. Cal	234.99 °C	Lamp DAC	2867
Des. Set	235.00 °C	Offset (NS)	1427
Des. raw	235.65 °C	Offset (NL)	893
Dopant Temp.	45.6 °C	Offset (PS)	1363
Trans. Bd. Temp.	48.3 °C	Offset (PL)	921
Power Bd. Temp.	54.1 °C	Trap	Out
Smp Flow	0.265 V	Trap DAC	1162
Smp Cal Start	0.259 V		
Smp Cal End	0.465 V		
Det Flow	0.544 V		
Det Cal Start	0.518 V		

Cool and Switch Dryer

☒ Detector Pump On

☐ Sample Pump/Valve On

☐ Enable Battery Charging

Close

The *Status* window displays:

- Current status of the flows
- Current status of the temperatures
- Amount of free drive space
- External power
- Main battery readiness
- Battery voltage
- Signal offset
- Absolute pressure
- Whether a trap is in or out of the desorber
- Regenerative dryer is in use or cooling and its temperature
- Last dryer check status

The *Status* window also enables you to:

- Turn the sample and detector pumps on and off
- Enable charging of the battery.

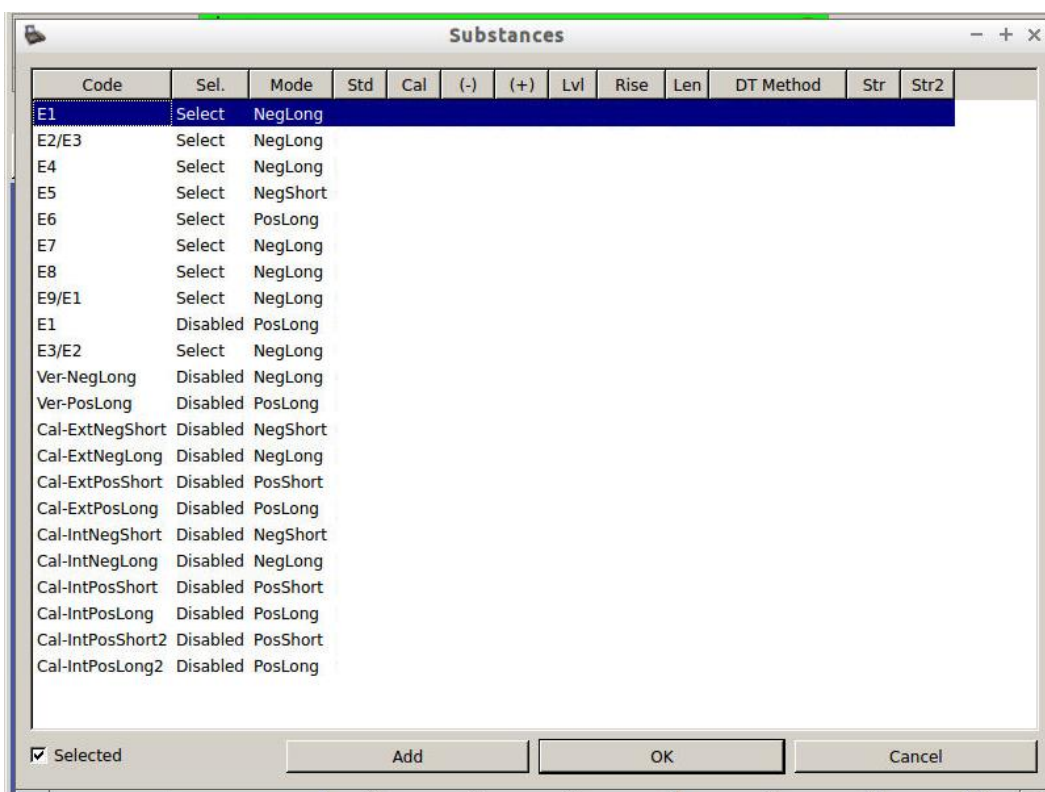
Substances

Use the **Substances** button to change the list of substances that the Itemiser® 4DX is set to detect. You can turn substances on or off for detection, modify substances, and add or remove substances.

Only users at the administrator level have access to this function.

To turn substances on or off for detection:

1. Press **Menu → Substances**.
2. Enter the daily password or press **Cancel**.
3. Highlight the substance you want to select (or clear):



NOTE

Images of the *Substances* window in this document have detection data removed in order to maintain security.

4. Select the *Selected* check box in the lower-left corner of the screen to select the substance; if you want to clear the substance, clear the **Selected** check box. When a substance is unchecked the column labeled *Sel.* displays *Disabled* for that substance:



5. Press **OK**.

The screen displays the main window.

This completes the procedure.

Adding Substances

You can add substances to the detection library.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

Contact Rapiscan Systems technical support for assistance.

To add a substance to the library:

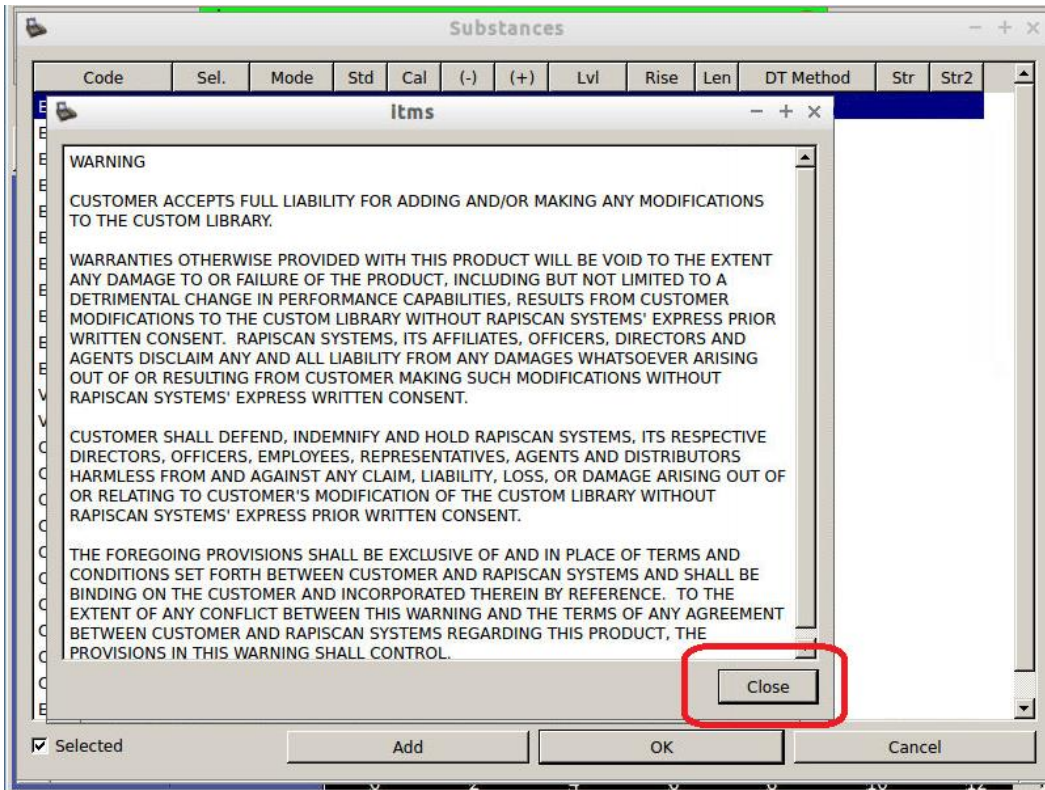
1. Press **Menu → Substances**.

The screen displays the *Substances* window.

2. Press **Add**.

The screen displays the legal disclaimer window.

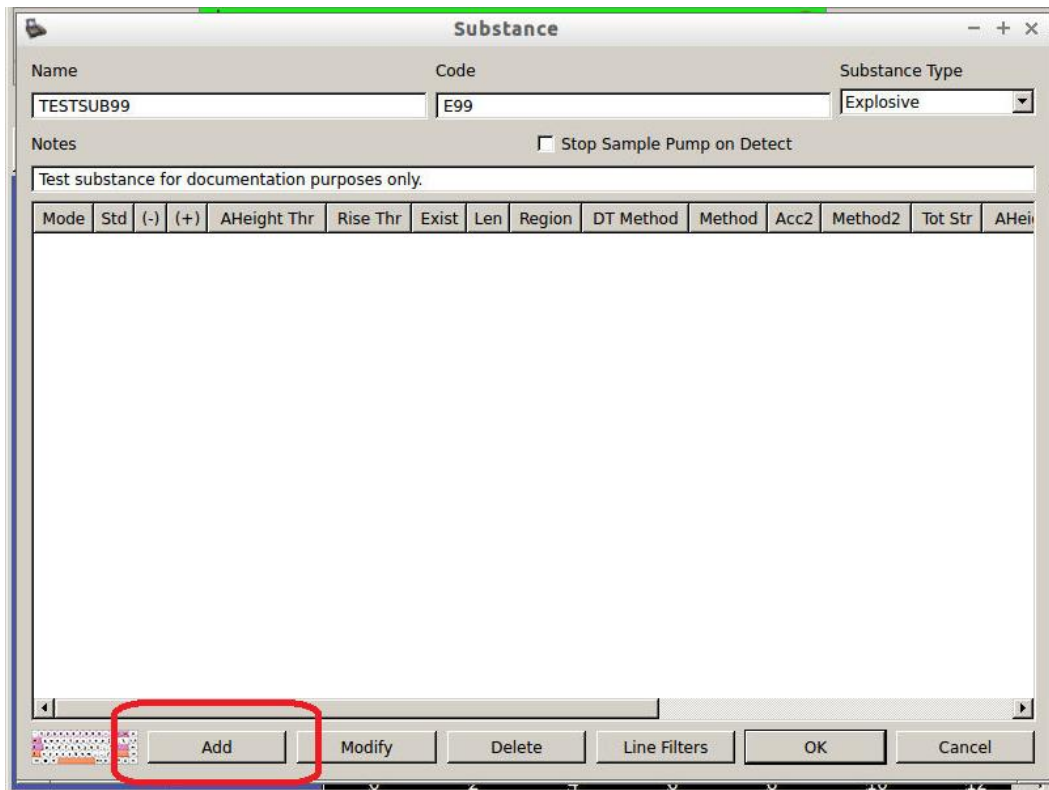
3. Read the disclaimer.

4. Press **Close**:

The screen displays the substance window.

5. Type the name of the substance you want to add in the **Name** field.
6. Type the code of the substance you want to add in the **Code** field.
7. Press the down-arrow in the **Substance Type** field and choose **Narcotic**, **Explosive** or **Contaminant**.
8. (Optional) Type any explanatory notes you want to add in the **Notes** field.
9. (Optional) Select the **Stop Sample Pump on Detect** button to turn off the sample pump as soon as the device detects the substance (this prevents the pump from introducing too much of the substance into the detector, and helps reduce the time necessary to clear the device after detection).

10. Press **Add**:

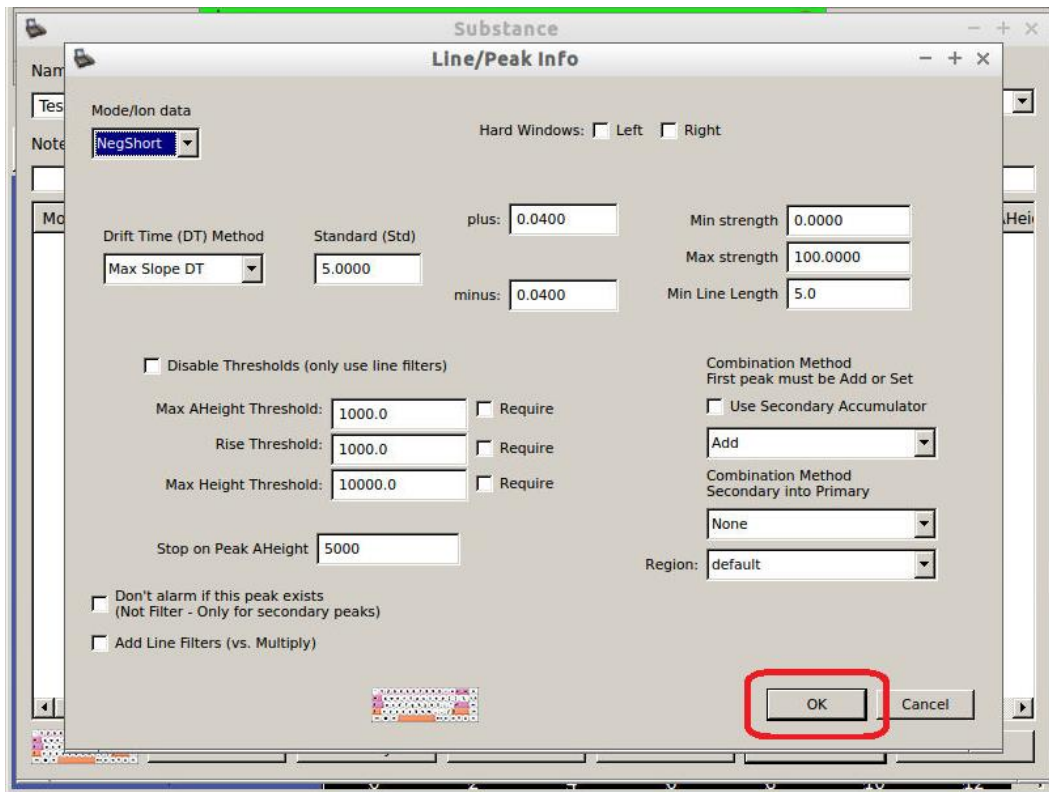


The screenshot shows a software window titled "Substance". It contains several input fields and a table. The "Name" field is filled with "TESTSUB99", the "Code" field with "E99", and the "Substance Type" dropdown is set to "Explosive". Below these is a "Notes" section with a checkbox "Stop Sample Pump on Detect" and a text area containing "Test substance for documentation purposes only." A table with 13 columns is visible, with headers: "Mode", "Std", "(-)", "(+)", "AHeight Thr", "Rise Thr", "Exist", "Len", "Region", "DT Method", "Method", "Acc2", "Method2", "Tot Str", and "AHei". At the bottom of the window, there is a row of buttons: "Add", "Modify", "Delete", "Line Filters", "OK", and "Cancel". The "Add" button is highlighted with a red rectangle.

The screen displays the *Line/Peak Info* window.

11. Enter the line information in the corresponding fields.

12. Press **OK**:



The screen displays the *Substance* window, with the line information you just added.

13. Press **OK**:

The screenshot shows the 'Substance' window with the following fields and table:

Name: TESTSUB99 Code: E99 Substance Type: Explosive

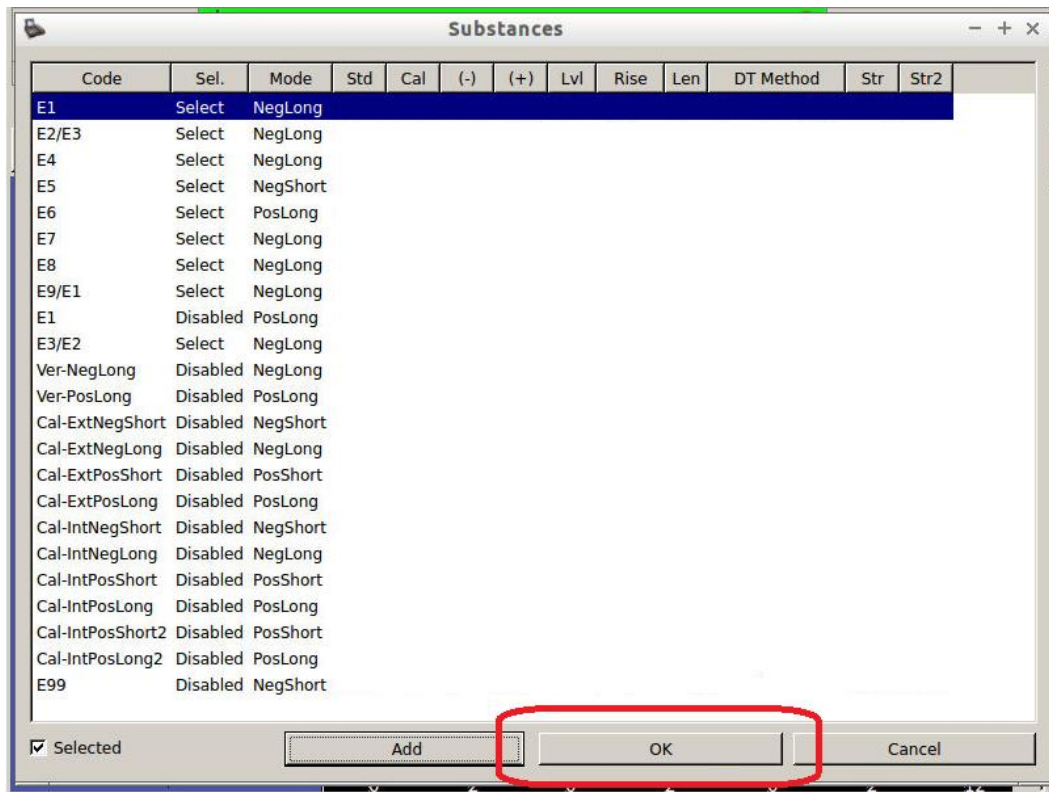
Notes: ☐ Stop Sample Pump on Detect
Test substance for documentation purposes only.

Mode	Std	(-)	(+)	AHeight Thr	Rise Thr	Exist	Len	Region	DT Method	Method	Acc2	Method2	Tot
NegShort	5.000	0.040	0.040	1000	1000	yes	5	default	Max Slope DT	Add	0	None	0.00

At the bottom of the window, the 'OK' button is highlighted with a red rectangle.

The screen again displays the *Substances* window, now with the substance you added at the bottom of the list (note that you may have to scroll down to see it).

14. Press **OK**:



NOTE

Images of the *Substances* window in this document have detection data removed in order to maintain security.

The screen displays the main window.
This completes the procedure.

Modifying Substances

You can modify only substances that you have added to the library—you cannot modify any of the default library substances.



CAUTION

This is an advanced procedure that requires specialized technical knowledge.

If you perform this procedure incorrectly, it can compromise the effective detection of explosives, sometimes in a manner that is not readily apparent.

Incorrectly performing this procedure can also result in the improper functioning of the device itself.

Contact Rapiscan Systems technical support for assistance.

To modify a substance:

1. Press **Menu** → **Substances**.
2. Highlight the substance you want to modify.
3. Press **Modify**.
The screen displays the *Substance* window.
4. Do one or both of the following:
 - To modify the basic information, edit the *Name*, *Code*, *Notes*, *Extend Sample Pump on Detect*, or *Stop Sample Pump on Detect* fields as necessary.
 - To modify the line information, press **Modify**. The screen displays the *Line/Peak Info* window. Edit the line information you want, and press **OK**.
5. Press **OK**.
The screen displays the *Substances* window, with your modifications now visible.
6. Press **OK**.
The screen displays the main window.

This completes the procedure.

Deleting Substances

You can delete only substances that you added to the library. You cannot delete any of the default library substances.

To delete a substance:

1. Press **Menu** → **Substances**.

The screen displays the *Substances* window.

2. Press the substance you want to delete.

3. Press **Delete**.

The screen displays a message that asks you to confirm that you want to delete the substance.

4. Press **Yes**.

The device deletes the substance you selected, and displays the *Substances* window.

5. Press **OK**.

The screen displays the main window.

This completes the procedure.

Thermal Clean

Use the **Thermal Clean** button to increase the desorber and detector temperatures in order to burn off contaminants.

Only users at the maintenance and administrator levels have access to this function.

To perform a thermal clean:

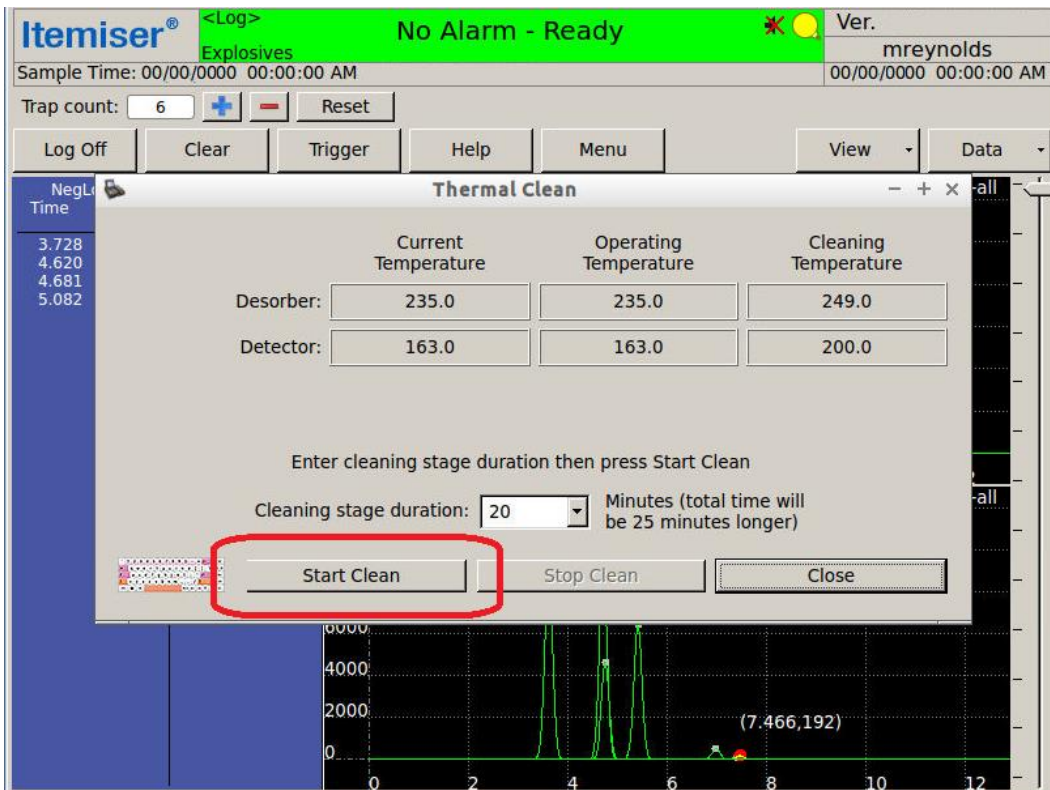
1. Press **Menu** → **Thermal Clean**.

The screen displays the *Thermal Clean* window.

2. Press the down-arrow to the right of the **Cleaning stage duration** field.

3. Select the duration of the cleaning procedure.

Note that this duration is only for the actual cleaning portion of the procedure; the device must also heat up, cool down, and stabilize as part of the procedure (these add 25 minutes to the overall length of time required to complete the procedure).

4. Press **Start Clean**:

The device begins the thermal clean process:

- During the heating phase, the device increases the temperature of both the desorber and detector. The *Thermal Clean* window shows this increase in both *Current Temperature* fields. The device continues increasing the temperature until the values in the *Current Temperature* fields match those in the *Cleaning Temperature* fields. The screen displays the *Thermal Clean* message in the status bar; the *Thermal Clean* window displays the *Heating, please wait* message. This phase takes approximately 5 minutes.
- The device maintains the cleaning temperature for the length of time you specified. The *Thermal Clean* window displays the *Cleaning Timer* message, along with the *Time Remaining* timer, during this phase.
- The device then begins a cooling phase. The *Thermal Clean* window displays the *Cooling, please wait* message. The values in both *Current Temperature* fields gradually decrease to the values in the *Operating Temperature* fields. This phase takes approximately 15 minutes.
- The device requires an additional 5 minutes for temperatures to stabilize. The screen displays the *Stabilizing Timer* message along with a timer counting down from 00:05:00.

When the device has completed the entire process, the screen displays the *Thermal Clean* window with no additional messages. The main screen displays the *No Alarm - Ready* message.

5. Press **Close**.

The screen displays the main window.

You can stop the thermal clean process at any point:

1. Press **Stop Clean**.

The screen displays a message that warns you that canceling the thermal clean may result in false alarms.

2. Press **Yes** to cancel the thermal clean, or **No** to continue.

If you cancel the thermal clean, the device closes the *Thermal Clean* window and displays the main screen.

Note that even if you cancel the thermal clean process, the device might still need time to cool down to its operating temperature, depending on what stage of the process it was in when you stopped it.

Toggle Lamp

Press the **Toggle Lamp** button to turn the lamp on and off.

Only users at the maintenance and administrator levels have access to this function.

To toggle the lamp on and off:

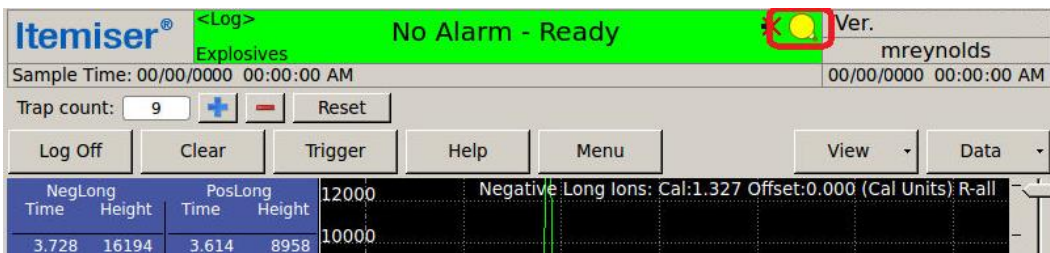
1. Press **Menu → Toggle Lamp**.

The device turns off the lamp and displays the lamp indicator in gray (the lamp indicator is in the upper right corner of the status bar).



2. Press **Menu → Toggle Lamp** again.

The device turns on the lamp and displays the lamp indicator in yellow.



This completes the procedure.

Upgrade Software

Use the **Upgrade Software** button to install a new version of the ITMS software on the device.

To do this, you must have the Software Upgrade Kit CD and a USB storage device (flash drive).

Note that the device uses two software components, the ITMS software (which handles the detection process) and the software GUI (which handles the features and user interface). You can upgrade either or both software components using the following procedure (if you choose to upgrade both components, perform the procedure twice, once for each).

To upgrade the device software:

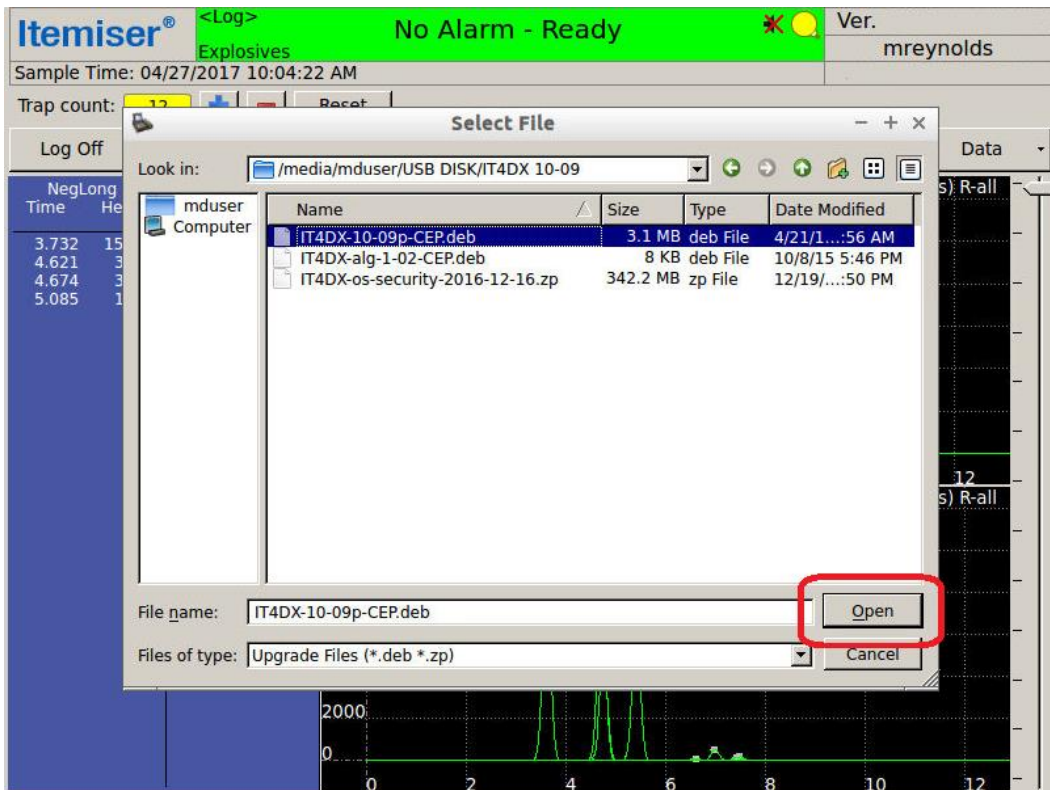
1. Copy the software file(s) from the Software Upgrade Kit CD to the USB storage device.
2. Insert the USB storage device into the USB port on the rear panel of the Itemiser[®] 4DX.
3. Press **Menu → Advanced Menu**.
4. Press **Upgrade Software**.

Your screen displays a window that asks you to insert the USB storage device.

5. Insert the USB storage device (if you have not already done so).
6. Press **OK**.

The screen displays the *Select File* window.

7. Navigate to the software upgrade you want to install.
8. Press the upgrade file you want to install (either a **.deb** or **.zp** file).

9. Press **Open**:

The screen displays the *Software Upgrade* message.

10. Press **OK**.

The device displays the *Software Upgrade...* message.

11. Press **OK**.

The device logs you off, exits the ITMS software, and restarts.

12. Wait for the screen to display the *Log Maintenance* window.

13. Enter a note that you upgraded the software.

14. Press **Save**.

The screen displays the *User Log On...* window.

15. Log in.

16. (Optional) If you installed the GUI software as part of this upgrade, you should restore all default settings ([see "Restore All Default Settings" on page 136](#)).17. Press **Menu** → **Safely Remove USB Device**.

18. Press the entry for the USB device you want to remove.

19. Press **Remove**.

The screen displays a message that tells you it is now safe to remove the USB device.

20. Press **OK**.

The screen displays the main window.

21. Remove the USB storage device.

This completes the procedure.

Users

Use the **Users** button to add, modify, and remove users authorized to use the device. You can also change each individual's user level.

The user level determines which functions users can perform, and what access they have to the information stored on the device (*see "User-Level Privileges" on the next page*). Every user in the Itemiser® 4DX database is assigned a user level.

There are four standard users levels:

- **Operator**—Users at this level have access to only basic functions and information.
- **Supervisor**—Users at this level have access to all operator-level functions and information, and access to additional functions and information.
- **Maintenance**—Users at this level have access to all operator- and supervisor-level functions and information, and access to additional functions and information.
- **Administrator**—Users at this level have access to all functions and information.

The main window displays the **User Name** and **Level** of the current user in the upper right corner (note that the main window displays this information only if the corresponding option is active):



You can also press **Menu → Config/Notes** to see the level of the current user.

User-Level Privileges

The default user-level privileges table lists the ITMS software functions that are available on the Itemiser® 4DX and which user levels have access to them. This table reflects the software defaults (your organization can change which functions are available to each level of user).

Table 3-15 *Default user level privileges*

Function	Shortcut Key	Operator	Supervisor	Maintenance	Administrator
Main Window					
Clear		✓	✓	✓	✓
Help	F1		✓	✓	✓
Log Off	Alt+o	✓	✓	✓	✓
View		✓	✓	✓	✓
Plasmagram			✓	✓	✓

Function	Shortcut Key	Operator	Supervisor	Maintenance	Administrator
List view		✓	✓	✓	✓
Intensity map				✓	✓
3-D				✓	✓
Data			✓	✓	✓
Select			✓	✓	✓
Pan			✓	✓	✓
Zoom	Ctrl+y		✓	✓	✓
Previous Zoom			✓	✓	✓
Reset Zoom			✓	✓	✓
Copy Live			✓	✓	✓
Copy Raw			✓	✓	✓
Copy Data			✓	✓	✓
Copy Peak Stats			✓	✓	✓
Show Substances			✓	✓	✓
Trigger	t			✓	✓
Menu Functions (Alt+M)					
Advanced Menu	Ctrl+n			✓	✓
Cancel	Esc	✓	✓	✓	✓
Change Mode				✓	✓
Configuration	Alt+c				✓
Config/Notes	Alt+n		✓	✓	✓
Exit ITMS	Alt+x				✓
External Calibrate			✓	✓	✓
History/Data Export	h		✓	✓	✓
Internal Calibrate			✓	✓	✓
Internal Cal Trigger				✓	✓
Live Mode	Ctrl+l			✓	✓

Function	Shortcut Key	Operator	Supervisor	Maintenance	Administrator
Manual Calibrate	c		✓	✓	✓
Options	o			✓	✓
Print	p		✓	✓	✓
Print Data and Config	Ctrl+p			✓	✓
Print Queue			✓	✓	✓
Print Options					✓
Random Search Generator	Ctrl+i		✓	✓	✓
Recall	r		✓	✓	✓
Safely Remove USB Hardware	Ctrl+v		✓	✓	✓
Save	Alt+s		✓	✓	✓
Set Device Name/Location		✓	✓	✓	✓
Status	s	✓	✓	✓	✓
Substances	l				✓
Add					✓
Modify an added substance					✓
Delete an added substance					✓
Thermal Clean				✓	✓
Toggle Lamp				✓	✓
Users	u	✓	✓	✓	✓
Add/Modify/Delete Users	u		✓	✓	✓
Change Password		✓	✓	✓	✓
Verify			✓	✓	✓
Advanced Menu Functions					
Adjust Date & Time					✓
Calibrate Pumps/Flows	Ctrl+x			✓	✓
Calibrate Purge Flow				✓	✓
Calibrate Sample Trap Sensor				✓	✓

Function	Shortcut Key	Operator	Supervisor	Maintenance	Administrator
Calibrate Temperatures				✓	✓
Calibrate Touchscreen				✓	✓
Change Language				✓	✓
Command Prompt					✓
Delete Alarm Files					✓
FPGA Diagnostics	Ctrl+b			✓	✓
Import User Database					✓
Open Alarms Folder	r				✓
Password/Security Policy					✓
Remote Connect Settings					✓
Restore All Default Settings and Delete All Alarm Files					✓
Restore Default Config	Ctrl+d			✓	✓
Run Application	Alt+e				✓
Set Default Cal Factors	Ctrl+f			✓	✓
Set Lamp Intensity					✓
Set User Privileges	Alt+p				✓
Show Network Name and IP				✓	✓
Start Up Options					✓
Upgrade Software	Alt+u				✓
Shortcut Key Functions					
Archive Config	Ctrl+a				✓
Compare a recalled file config to the current config.	Ctrl+c				✓
Diagnostics and Logging	v			✓	✓
Export an xml config (config.xml)	x				✓
Extract config from data file (config.sav)	Alt+b				✓
Get File	g				✓

Function	Shortcut Key	Operator	Supervisor	Maintenance	Administrator
Import config.bin or config.sav file	Alt+i				✓
Change/Set Serial Number	Ctrl+s				✓
Print the Users list	Ctrl+u				✓
Reprocess recalled data file with the current config.	Alt+r				✓
Restore Config	Ctrl+r				✓
Statistics Dialog	Ctrl+t				✓

Adding Users

Supervisor-, maintenance-, and administrator-level users can add users to the Itemiser® 4DX database.

You can add users only at your own level and below. For example, if you are a supervisor-level user, you can add operator-level users and supervisor-level users, but you cannot add administrator-level users.

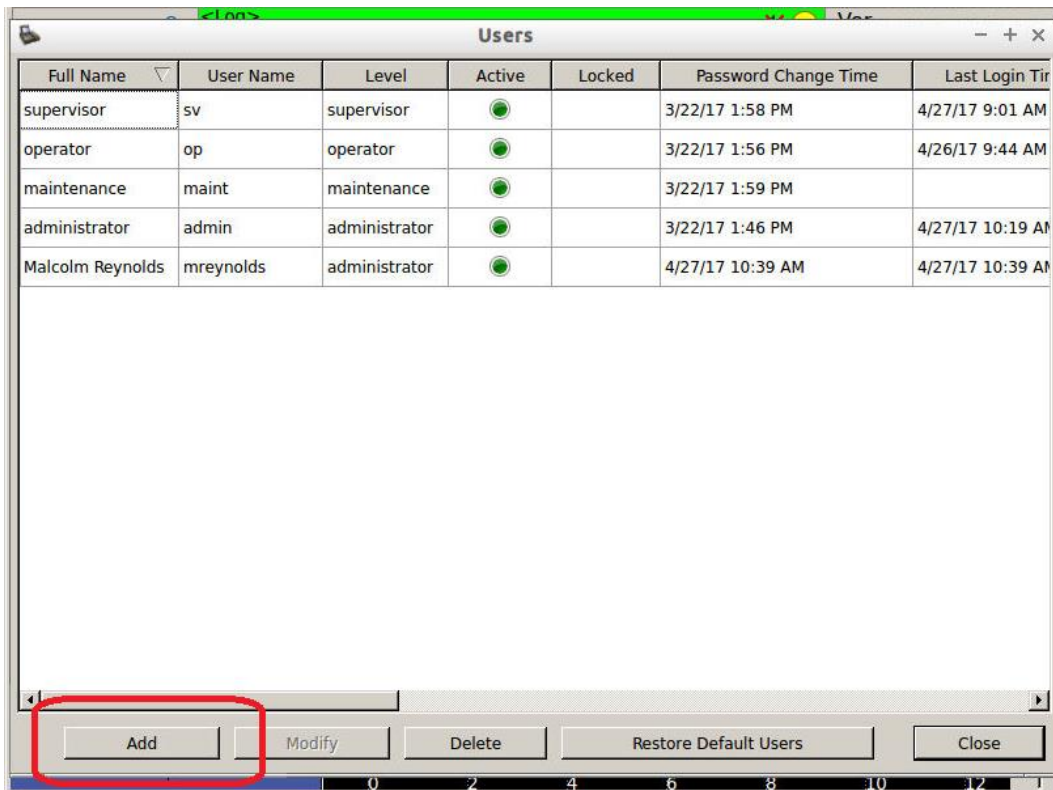
To add a user:

1. Press **Menu → Users**.

The screen displays the *Users* window. The contents of the window depend on your user level:

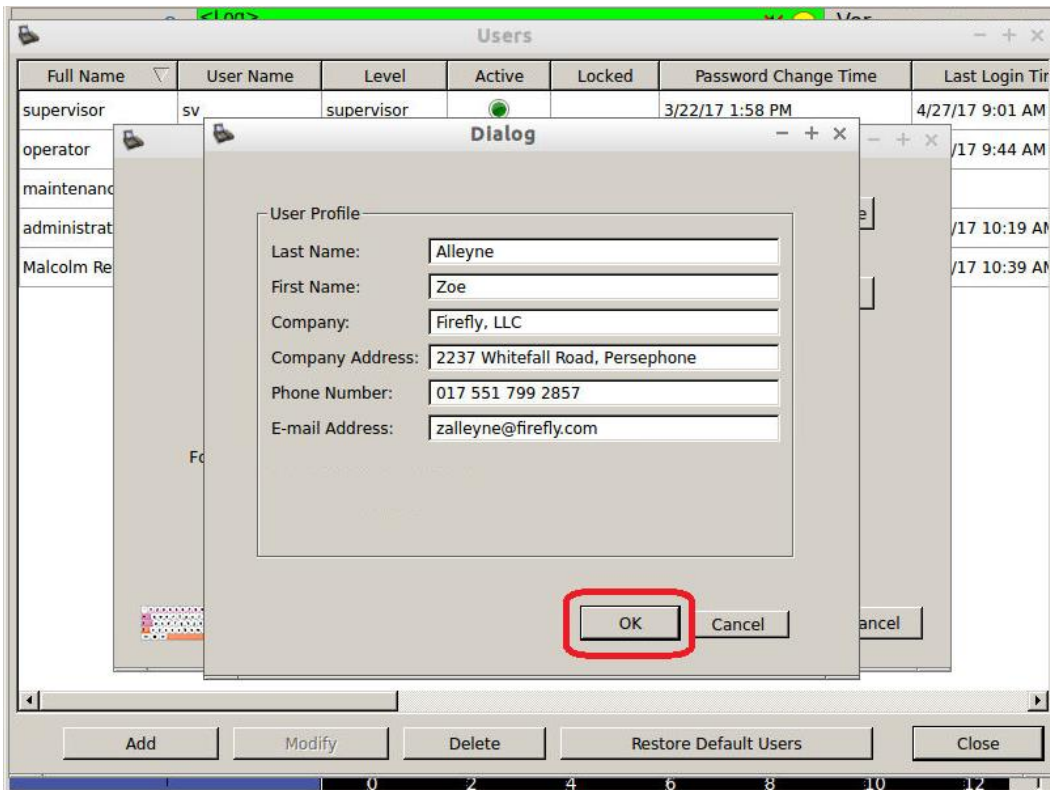
- If you are an operator-level user, the *Users* window displays only your own listing.
- If you are a supervisor- or maintenance-level user, the window displays your own entry and all users below your level.
- If you are an administrator-level user, the window displays all users.

The following screen examples show the procedure for an administrator-level user.

2. Press **Add**:

The screen displays the *User* window.

3. (Optional) Enter full information for the user:
 - a. Press **Change User Profile**. The screen displays the *User Profile* window.
 - b. Type the user's last name, first name, company, company address, phone number, and e-mail address in the corresponding fields.
 - c. Press **OK**:



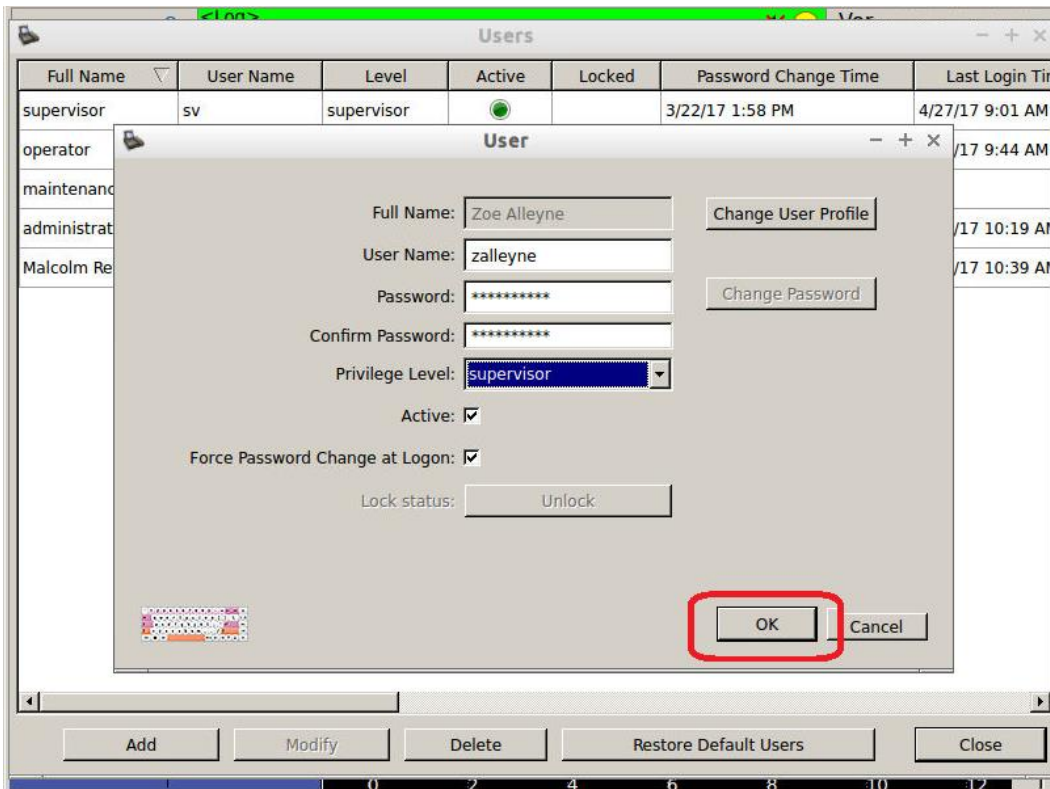
The screen again displays the *User* window.

4. Type the user name (log-on name) in the **User Name** field.
5. Type the user's password in the **Password** field. The default values require that each user password be unique, and contain the following:
 - At least 8 characters, and no more than 16 characters
 - At least 1 lower-case letter
 - At least 1 upper-case letter
 - At least 1 number
 - At least 1 special character (the top row of the standard keyboard, in Shift mode)

Note that your organization can change these default values; follow your organization's guidelines to create effective passwords.

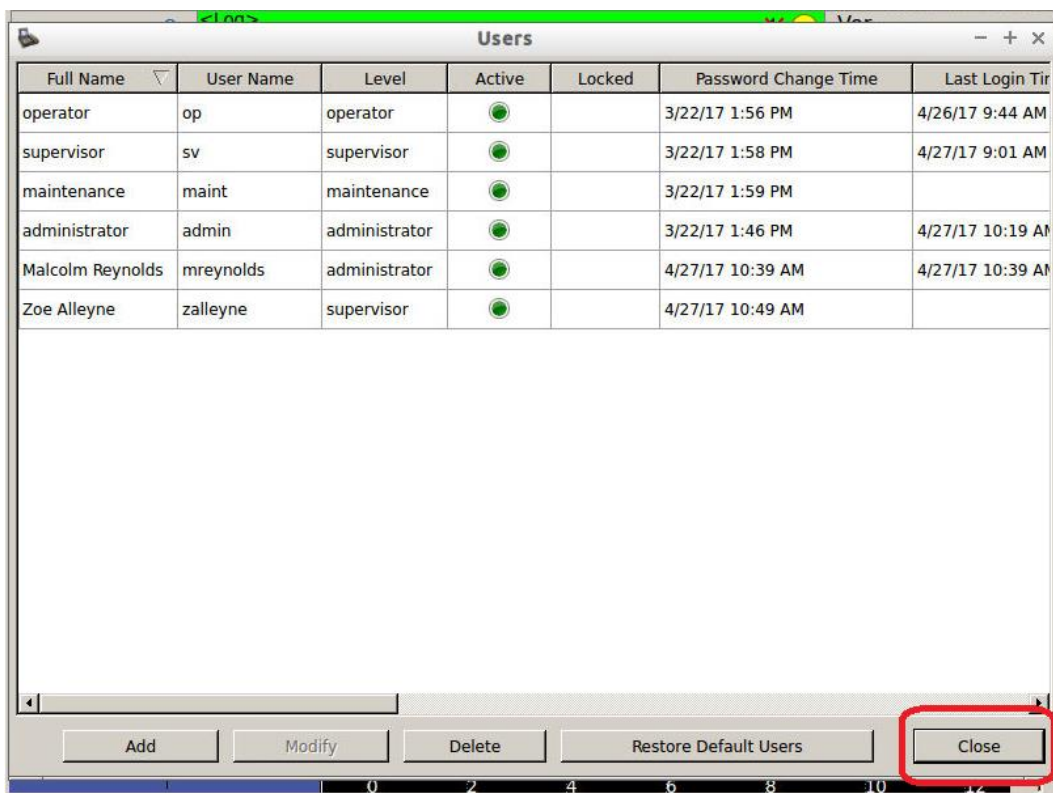
6. Type the user's password again in the **Confirm Password** field. Note that what you type must match what you typed in the **Password** field.

7. Press the down-arrow to the right of the **Privilege Level** field and choose the user level.
8. Select the **Active** check box if this is an active user; if the user is not active, clear the **Active** check box.
9. (Optional) If you want to require the user to select their own password, select the **Force password Change at Logon** check box. If you do this, the password you assign works only one time; the user must change his or her password to continue using the device.
10. Press **OK**:



The screen displays the *Users* window, updated to include the user you just added at the bottom of the list.

Note that the next time you view the *Users* window, it lists the new user alphabetically by full name.

11. Press **Close**:

The screen displays the main window.

This completes the procedure.

Modifying User Information

You can modify user information for users only at your own level and below. For example, if you are a supervisor-level user, you can modify operator-level users and supervisor-level users, but you cannot modify administrator-level users. If you are an operator-level user, you can modify only your own user record.

To modify a user's information:

1. Press **Menu → Users**.

The screen displays the *Users* window.

2. Select the user you want to modify.

3. Press **Modify**.

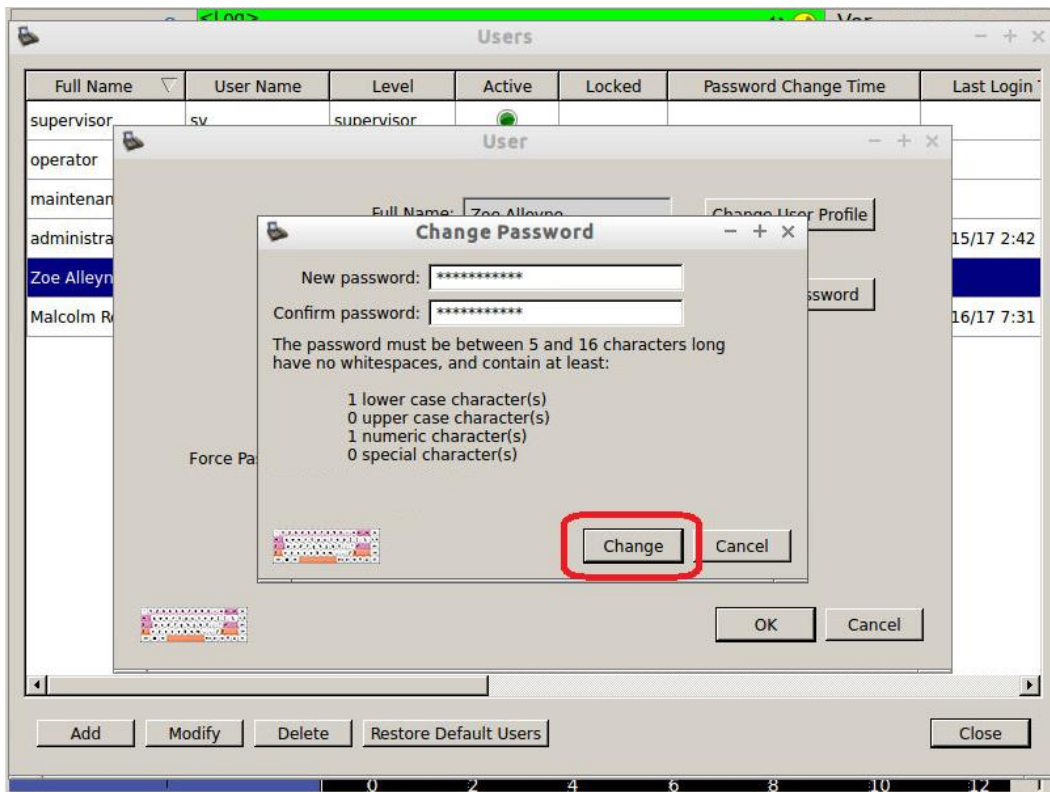
The screen displays the *User* window for the user you selected.

4. Edit the user information as necessary.

5. To change the user's password, press **Change Password**.

The screen displays the *Change Password* window.

6. Type the password in the **New password** field.
7. Type the password again in the **Confirm password** field.
8. Press **Change**:



The screen closes the *Change Password* window and displays the updated *User* window.

9. Press **OK**.

The device closes the secondary *User* window, and displays the main *Users* window.

10. Press **Close**.

The screen displays the main window.

This completes the procedure.

Deleting User Records

Only supervisor-, maintenance-, and administrator-level users have the rights necessary to delete a user record.

**NOTE**

You cannot delete your own user record.

To delete a user record:

1. Press **Menu → Users**.

The screen displays the *Users* window.

2. Press the name of the user whose record you want to delete.

3. Press **Delete**.

The device displays a message that asks you to confirm that you want to delete the user record.

4. Press **Yes**.

The screen displays the updated *Users* window.

5. Press **Close**.

The screen displays the main window.

This completes the procedure.

Restoring Default Users

This option deletes the current user database, including any new users that have been added, and restores the original default database (the original four users). Only maintenance- and administrator-level users have access to this option.

To restore the default users:

1. Press **Menu → Users**.

The screen displays the *Users* window.

2. Press **Restore Default Users**.

The screen displays a warning message that asks you to confirm your action.

3. Press **Yes**.

The device deletes the current user database, and restores the default user database. It also logs you off.

This completes the procedure.

Verify

The verification procedure is an additional test that determines if the Itemiser® 4DX is correctly calibrated:

1. Press **Menu** → **Verify**.
The screen displays the *Insert Ver Trap* message.
2. Put on clean, powder-free gloves.
3. Carefully remove a verification trap from the package; close the package cover immediately.



IMPORTANT

Never touch the sample area of a calibration or verification trap, or allow it to come into contact with any other object or surface. The test substance on the trap can contaminate any surface, and cause a false indication of the presence of explosives.

4. Insert the trap into the desorber slot.
The device automatically begins sampling, and displays the *Sampling* message.
5. When the screen displays the *Please Remove Sample* message, remove the trap and discard it immediately.



NOTE

You can use a verification trap only once. Discard it immediately after removing it from the desorber slot.

The screen displays the *Explosives Detected* warning in the status bar, and the *Verification Successful* message. If the verification procedure is not successful, the screen displays the *Verification Failed* message (you must then repeat the manual calibration procedure).

6. Press **OK**.
The screen discontinues the display of the *Verification Successful* message.
7. Press **Clear**.
The screen displays the *Insert Clean Trap* message.
8. Insert a clean sample trap into the desorber slot.
9. When the screen displays the *Please Remove Sample* message, remove the trap.
After a brief delay, the screen displays one of two messages:
 - If the screen displays the *Insert Clean Trap* message again, repeat steps 9 and 10.
 - If the screen displays the *No Alarm - Ready* message, the device is ready for operation.



IMPORTANT

If you cannot successfully complete the verification process, this indicates that the device has been improperly calibrated, or is malfunctioning. Contact Rapiscan Systems technical support immediately (see "Technical Support" on page 1).

CHAPTER 4

Warnings

Introduction to Warnings	174
Battery Low Warning	175
Calibration Warning	176
Detector Flow Warning	177
Dryer Warning	178
Hardware Error	179
Heater Warning	180
Lamp Calibration Warning	181
Lamp Warning	182
Purge Flow Warning	183
Sample Flow Warning	184
Stabilizing Temperature Warning	185
Stabilizing	186

Introduction to Warnings

The device displays a warning message whenever it is performing a task that takes it out of operation, or when there is a malfunction or other fault.

The screen displays these warning messages, with a yellow background, in the status bar.

Press the warning message to see the details screen. This screen describes the fault, and also displays troubleshooting information you can use to resolve the warning. If there is more than one warning condition, the screen displays the warning with the highest priority in the status bar, but provides information on all warnings in the message.

To print a copy of the warning message details screen, press **Print**.

To close the warning message details screen, press **Close**.

Users of all levels can see warnings, but the procedures required to resolve some warnings are restricted to certain levels of users.

The *History Data Export* menu function also provides additional information when diagnosing warnings.

Battery Low Warning

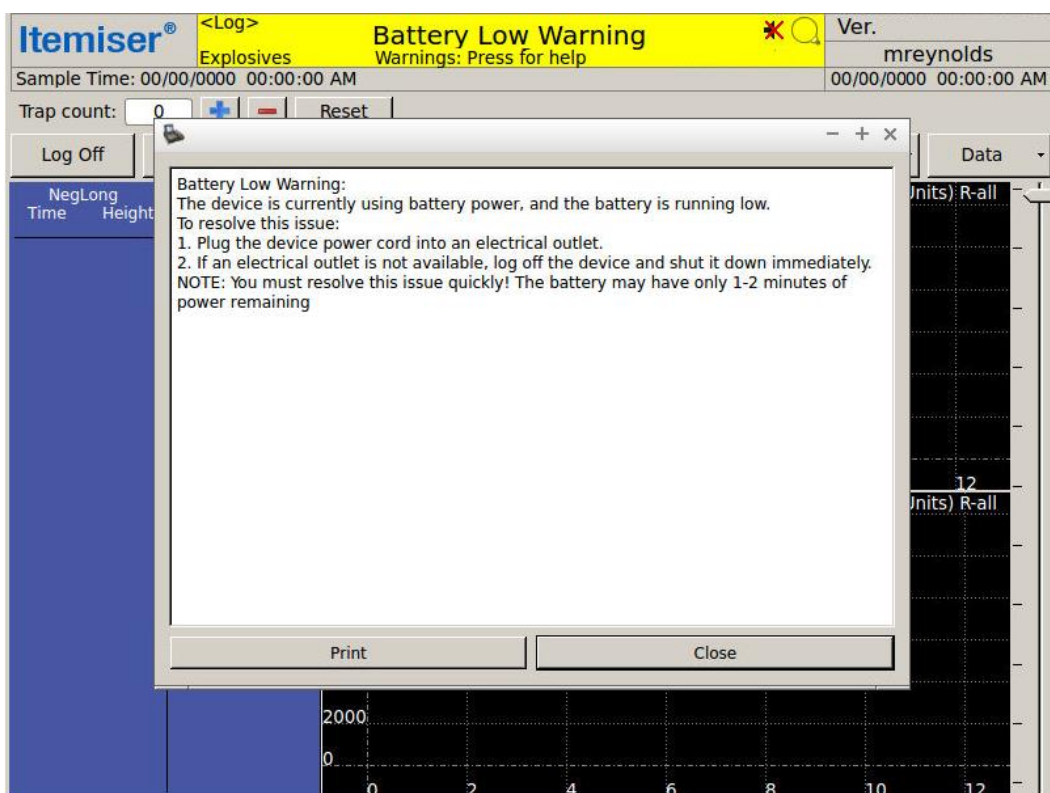
The screen displays the *Battery Low Warning* when the back-up battery power is low.

If you see this message, you must quickly shut down the device or plug it into an electrical power source.



CAUTION

Do not power on the device using the internal battery. The power required to heat the device to its operating temperature takes nearly the entire capacity of the battery, and can significantly reduce battery life. Use the internal battery only when the device is already at its operating temperature and is displaying the *No Alarm-Ready* message.



To resolve the *Battery Low Warning*:

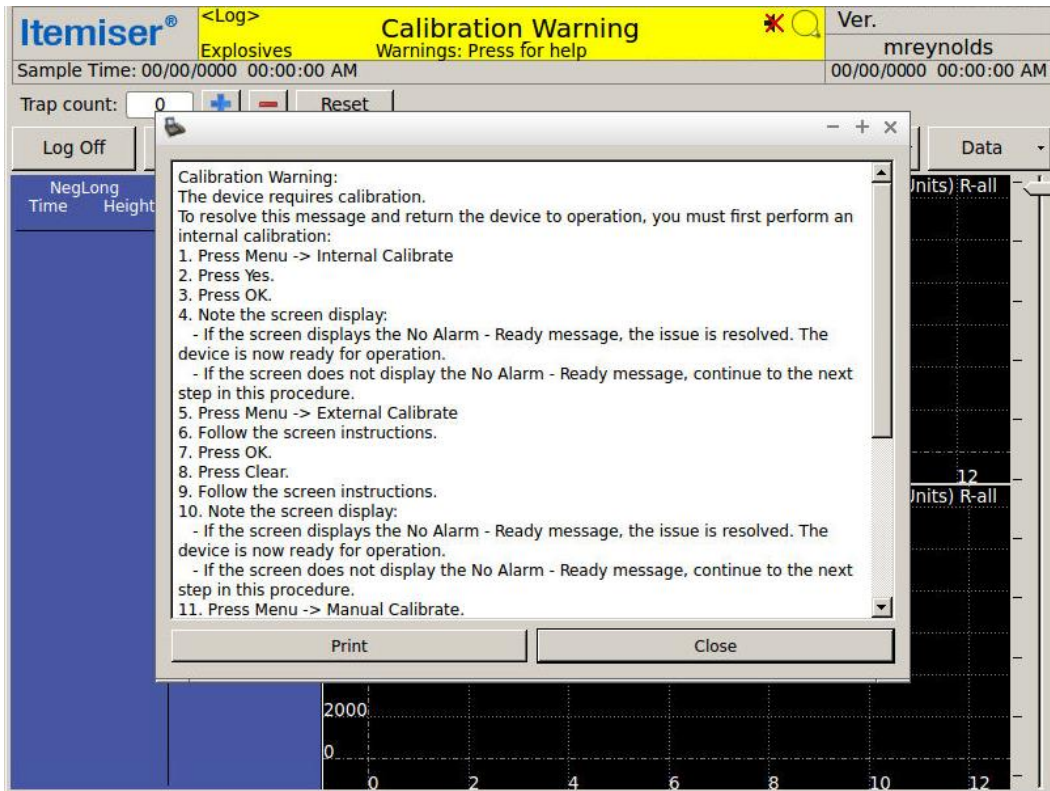
1. Plug the device power cord into an electrical outlet.
2. If no electrical outlet is available, log off the device and shut it down.

This completes the procedure.

Calibration Warning

The screen displays the *Calibration Warning* message when the Itemiser® 4DX is unable to accurately detect explosives and other substances.

This is often due to changes in temperature, humidity, air pressure, or other environmental factors. It may also be the result of incorrect calibration or a malfunction.



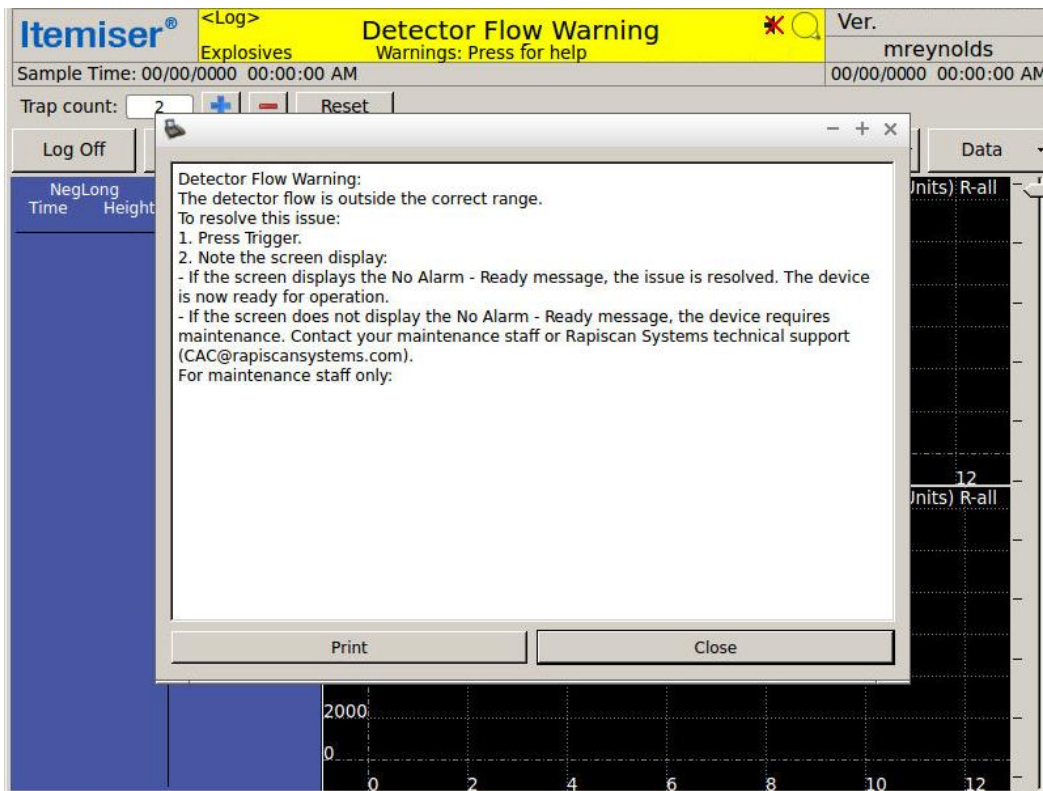
To resolve the *Calibration Warning* message:

1. Perform an internal calibration ([see "Internal Calibrate" on page 107](#)).
2. If the warning persists, perform an external calibration ([see "External Calibrate" on page 89](#)).
3. If the warning persists, perform a manual calibration ([see "Manual Calibrate" on page 111](#)).
4. If the warning still persists, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

Detector Flow Warning

The *Detector Flow Warning* indicates that the detector flow is out of range.



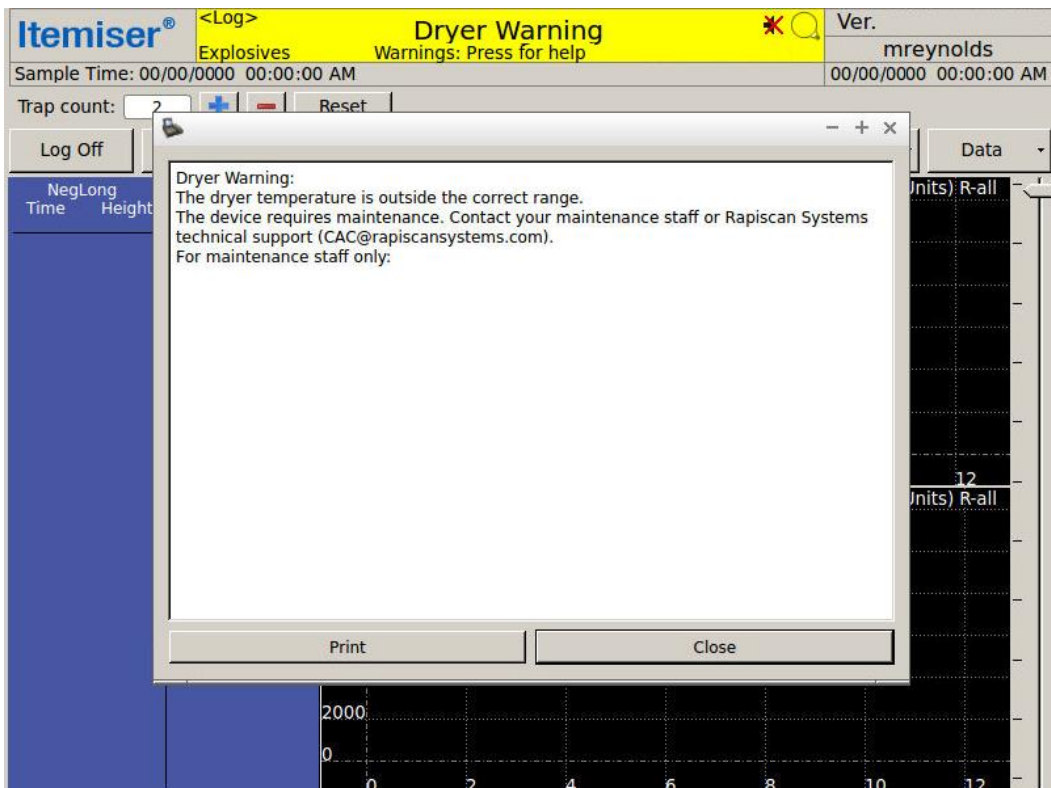
To resolve the *Detector Flow Warning*:

1. Press **Trigger**.
2. If the warning persists, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

Dryer Warning

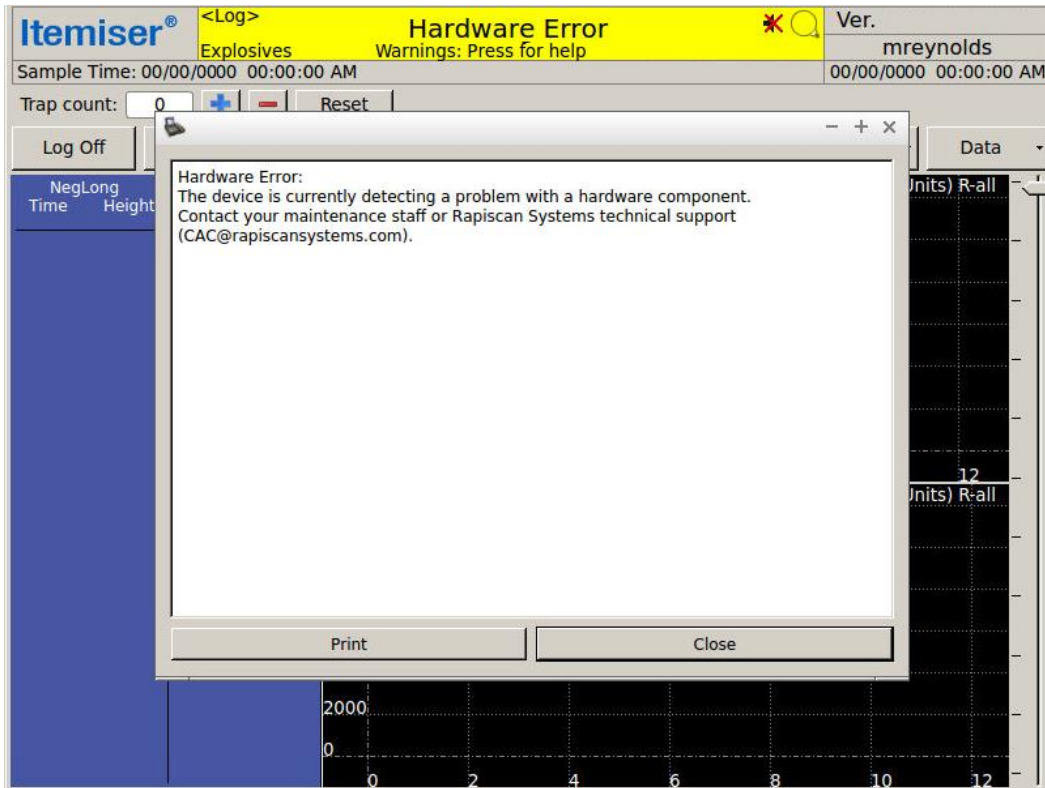
The screen displays the *Dryer Warning* to indicate that the regenerative dryer temperatures are out of specification or the dopant peak has shifted outside of specification.



To resolve the *Dryer Warning*, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

Hardware Error

The *Hardware Error* message indicates that there may be a fault with a hardware component.



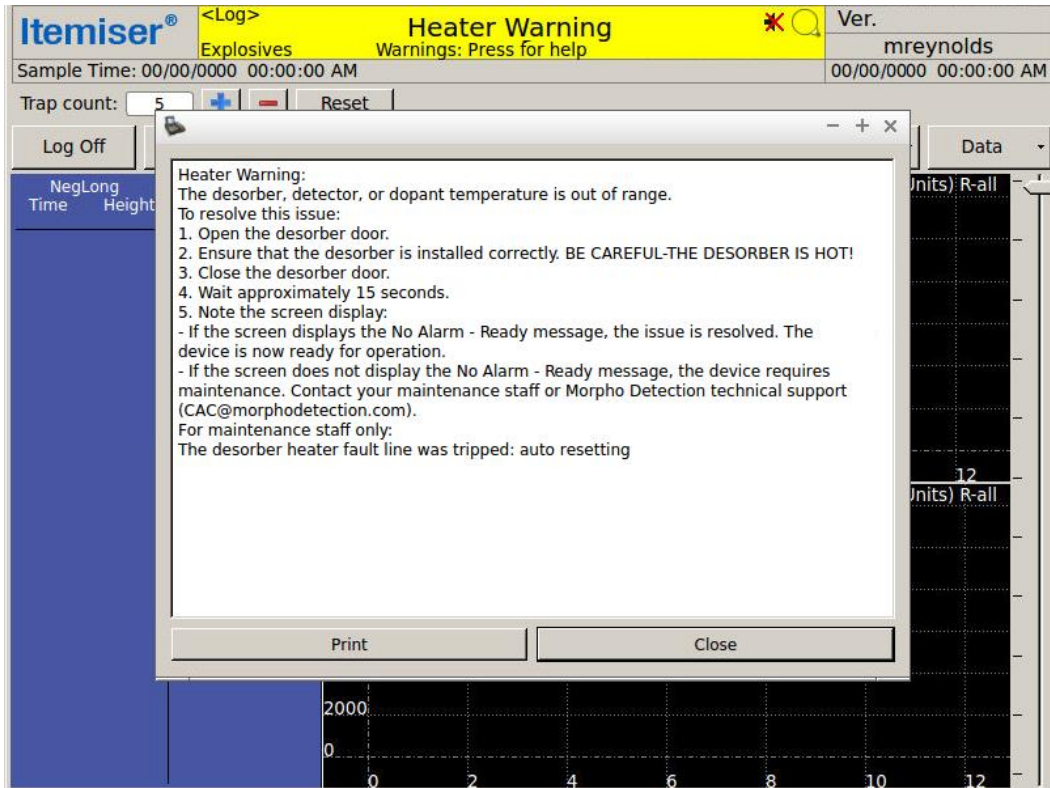
Contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

Heater Warning

The *Heater Warning* indicates one or more of the following:

- A hardware problem with the detector or desorber heater circuit
- The dopant temperature is out of range
- The desorber is not seated correctly or is detached (in this case, the screen displays a message that asks you to check that the desorber is seated correctly)

The device may display the *Heater Warning* along with the *Stabilizing Temperature Warning*.



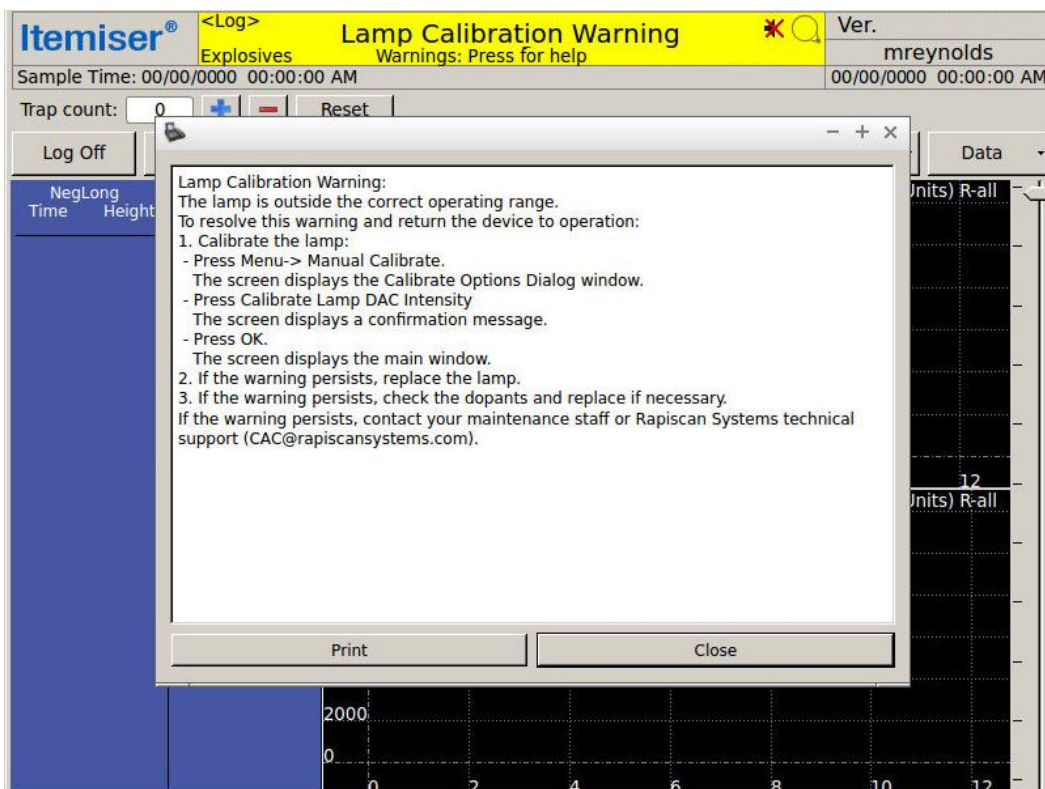
To resolve the *Heater Warning*:

1. Ensure that the desorber is installed correctly.
2. If the warning persists, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

Lamp Calibration Warning

The screen displays the *Lamp Calibration Warning* to indicate that the lamp is outside its correct operating range.



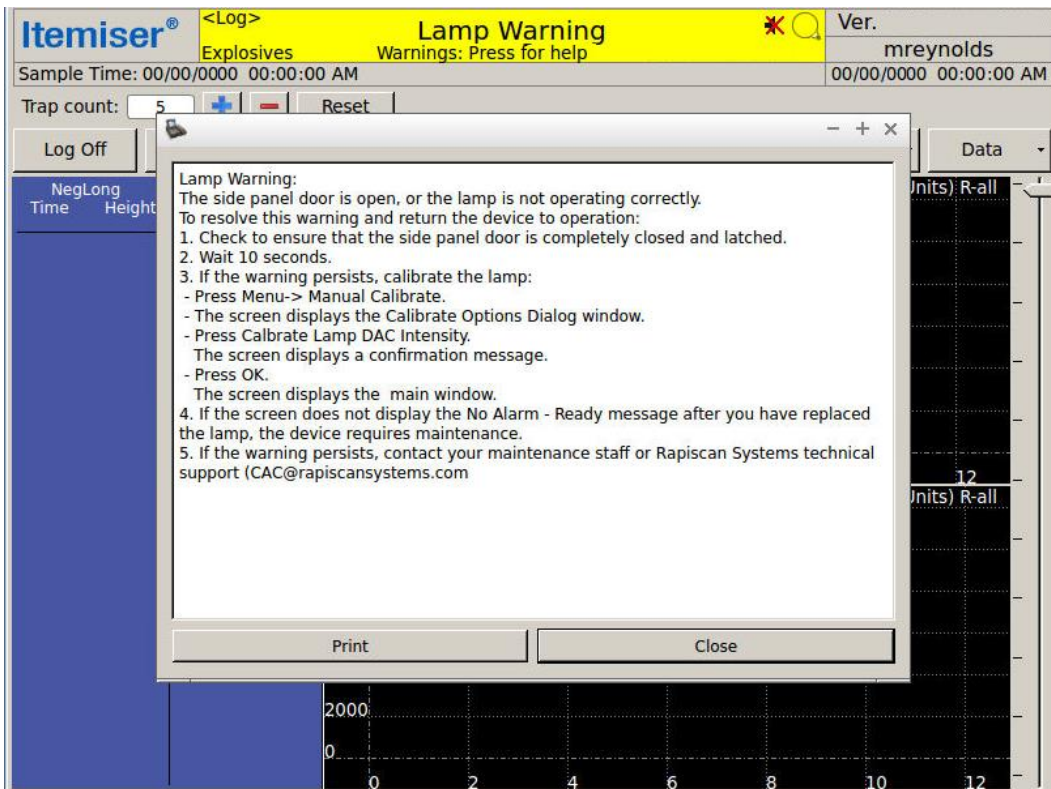
To resolve the *Lamp Calibration Warning* message:

1. Calibrate the lamp:
 - a. Press **Menu Manual Calibrate**.
The screen displays the *Calibrate Options Dialog* window.
 - b. Press **Calibrate Lamp DAC Intensity**.
The screen displays a confirmation message.
 - c. Press **OK**.
The screen displays the main window.
2. If the warning persists, replace the lamp (*see "Replace the Lamp" on page 211*).
3. If the warning persists, check the dopants and replace if necessary (*see "Check the Positive Ion Dopant" on page 204*) and (*see "Check the Negative Ion Dopant" on page 205*).
4. If the warning persists, contact your maintenance staff or Rapiscan Systems technical support (*see "Technical Support" on page 234*).

This completes the procedure.

Lamp Warning

The *Lamp Warning* indicates that the side panel door is open or the lamp is not functioning correctly.



To resolve the *Lamp Warning* message:

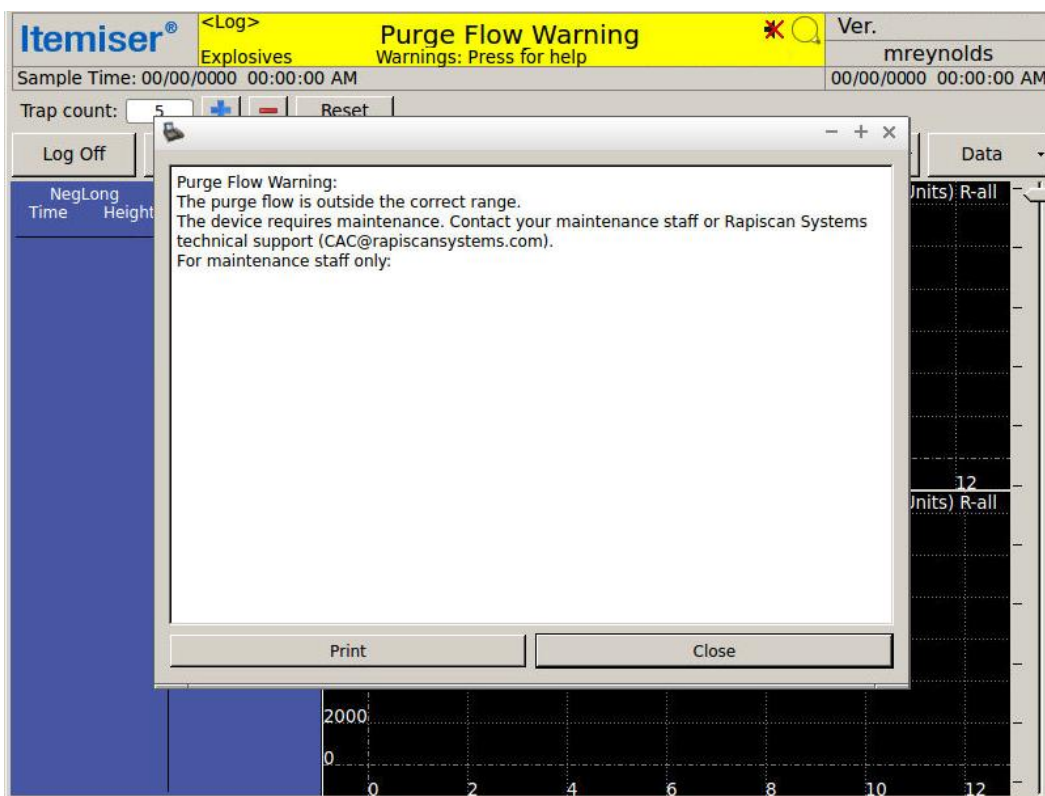
1. Check to ensure that the side panel door is completely closed and latched.
2. Wait 10 seconds.
3. If the warning persists, calibrate the lamp:
 - a. Press **Menu Manual Calibrate**.
The screen displays the *Calibrate Options Dialog* window.
 - b. Press **Calibrate Lamp DAC Intensity**.
The screen displays a confirmation message.
 - c. Press **OK**.
The screen displays the main window.
4. If the warning persists, replace the lamp (*see "Replace the Lamp" on page 211*).

5. If the warning persists, check the dopants and replace if necessary ([see "Check the Positive Ion Dopant" on page 204](#)) and ([see "Check the Negative Ion Dopant" on page 205](#)).
6. If the warning persists, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

Purge Flow Warning

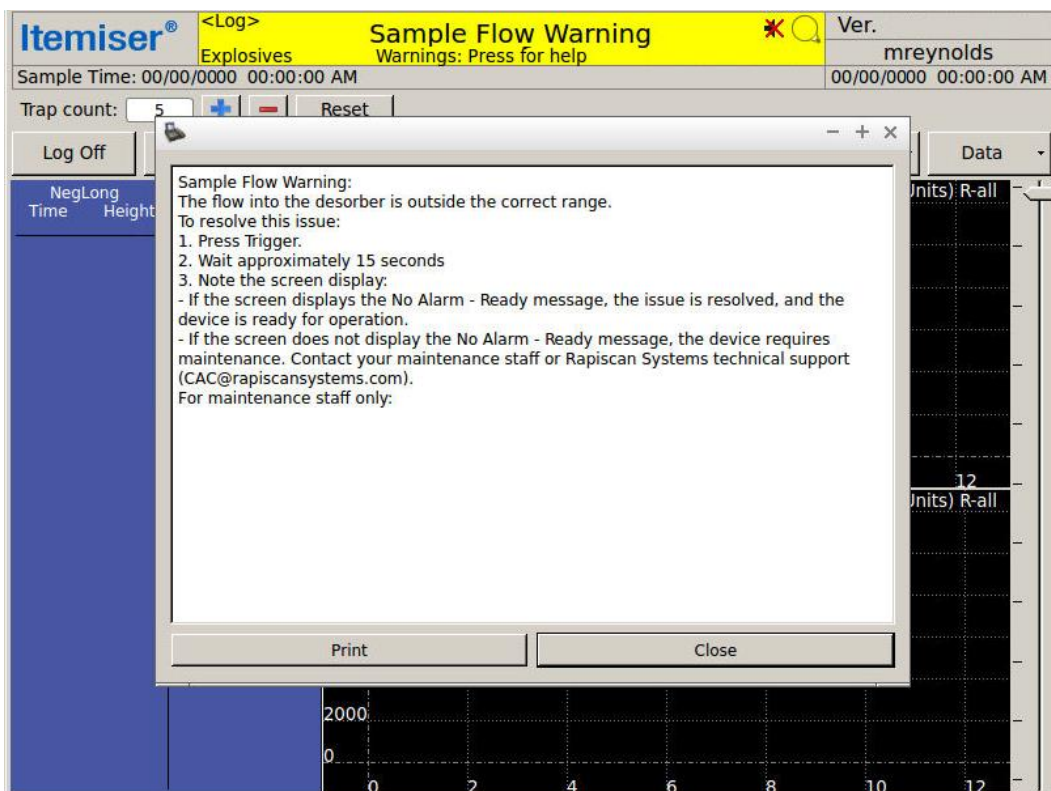
The screen displays the *Purge Flow Warning* to indicate that the purge flow is out of specification.



To resolve the *Purge Flow Warning*, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

Sample Flow Warning

The *Sample Flow Warning* indicates that the sample flow value is out of range.



To resolve the *Sample Flow Warning*:

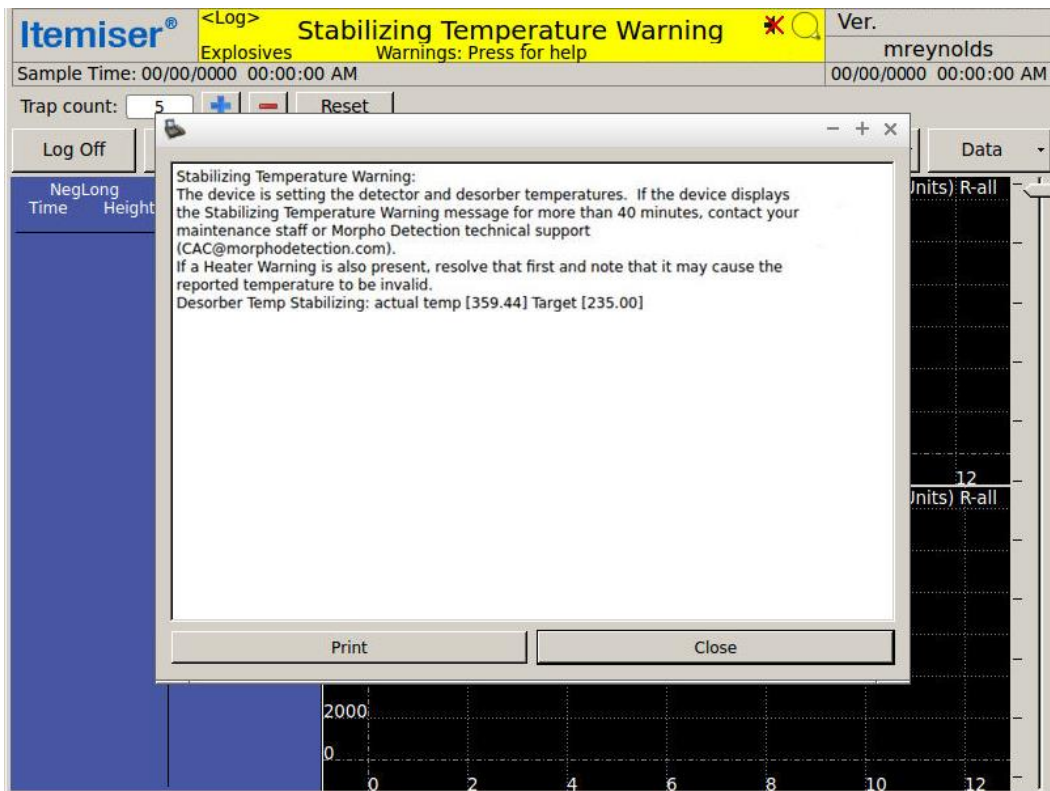
1. Press **Trigger**.
2. If the warning persists, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

Stabilizing Temperature Warning

The screen displays the *Stabilizing Temperature Warning* when the device is warming up.

The *Stabilizing Temperature Warning* can also indicate that the device is experiencing a malfunction.



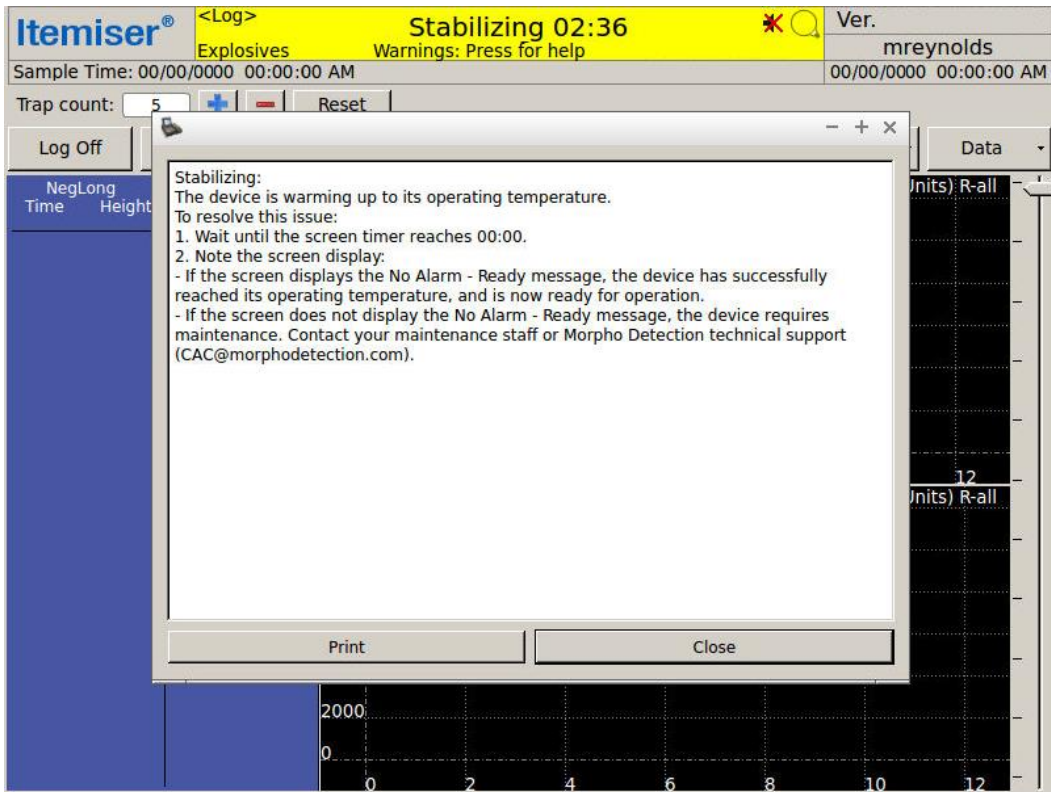
To resolve the *Stabilizing Temperature Warning*:

1. Wait at least 40 minutes for the device to bring the detector and desorber temperature up to the correct operating range.
2. If the warning persists, or if the temperatures differ more than the limits indicated on the *Status* screen, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

Stabilizing

The screen displays the *Stabilizing* warning along with a counter during the warm-up period. The stabilizing timer counts down to ensure that the device warms up properly. The time required depends on the length of time the device was powered off ([see "Warm-Up Time" on page 48](#)).



To resolve the *Stabilizing* warning:

1. Wait for the timer to reach 00:00.
The screen displays the *No Alarm-Ready* message.
2. If the warning persists, contact your maintenance staff or Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

This completes the procedure.

CHAPTER 5

Maintenance

Introduction to Maintenance	189
Calibration	189
Monthly Maintenance	190
Log Off and Shut Down	190
Remove the Desorber and Nozzle	192
Check the Interface O-Ring	194
Replace the Mesh Screen	195
Clean the Desorber	198
Power On the Device	201
Calibrate the Pumps and Flows	202
Perform an Internal Calibration	202
Return to Operation	202
Six-Month Maintenance	203
Log Off and Shut Down	203
Remove the Desorber and Nozzle	203
Check the Interface O-Ring	203
Replace the Mesh Screen	204
Check the Positive Ion Dopant	204
Check the Negative Ion Dopant	205
Clean the Desorber	207
Power On the Device	207
Calibrate the Pumps and Flows	207
Perform an Internal Calibration	207
Return to Operation	208

As-Needed Maintenance	208
Install Printer Paper	208
Clean the Exterior of the Device	210
Check the Supply of Consumables	211
Calibrate the Touchscreen	211
Replace the Lamp	211
Replace the Lamp (Hot Swap)	217
Replace the Inlet Filters	223
Maintenance Reminders	226
Adding Dealer Contact Information	227
Maintenance Logs	229
Monthly Maintenance Log	230
Six-Month Maintenance Log	231
As-Needed Maintenance Log	232

Introduction to Maintenance

This section describes how to perform maintenance on the Itemiser® 4DX:

- Monthly maintenance
- Six-month maintenance
- As-needed maintenance

Note that the environmental and operational conditions at your location may require you to perform maintenance more frequently.

You should also clean a nearby surface so that you can place components there without the risk of contaminating them. Use an alcohol wipe to clean the surface.

Always log every maintenance procedure you perform. This helps Rapiscan Systems field service personnel diagnose and remedy issues as quickly as possible.

To log your maintenance activities, you can use the Rapiscan Systems maintenance log pages ([see "Maintenance Logs" on page 229](#)) or you can add a maintenance log to the device history ([see "Log Maintenance" on page 110](#)).



NOTE

If the status bar displays any warning message other than the *Calibration Warning*, resolve the warning before you perform any maintenance.

When performing maintenance, always wear clean, powder-free gloves and use only Rapiscan Systems-supplied consumables, parts, and supplies.

Calibration

Moisture, temperature, and atmospheric pressure all affect the ability of the Itemiser® 4DX to detect explosives and other substances. The device automatically performs a calibration procedure in order to compensate for these effects, ensuring reliable detection ([see "Internal Calibrate" on page 107](#)).

When environmental or other factors make it impossible for the Itemiser® 4DX to successfully perform the calibration procedure, the device displays the *Calibration* warning message.

To resolve this message and return the device to operation, you must first perform an external calibration ([see "External Calibrate" on page 89](#)).

If this does not resolve the issue, the next step is to perform a manual calibration ([see "Manual Calibrate" on page 111](#)).

If the manual calibration does not resolve the issue, contact Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

**NOTE**

Always use Rapiscan Systems-supplied calibration traps for all calibration procedures. Order these from Rapiscan Systems customer service ([see "Customer Service " on page 235](#)).

The third method of calibrating the device, the single-peak calibration routine, is reserved for use by technical support staff.

Monthly Maintenance

To keep the device operating at peak performance, perform the procedures listed in this section every month. Perform the procedures in the order listed:

1. Log off, and shut down the device.
2. Remove the desorber, nozzle ring nut, and nozzle.
3. Check the interface O-ring.
4. Replace the mesh screen.
5. Clean the desorber.
6. Power up the device.
7. Calibrate pumps and flows.
8. Perform the internal calibration procedure.
9. Return the device to operation.
10. Log all maintenance procedures.

**NOTE**

When maintaining the device, you must wear clean, powder-free gloves and use only Rapiscan Systems-supplied consumables, parts, and supplies.

Log Off and Shut Down

Log off the device and shut it down:

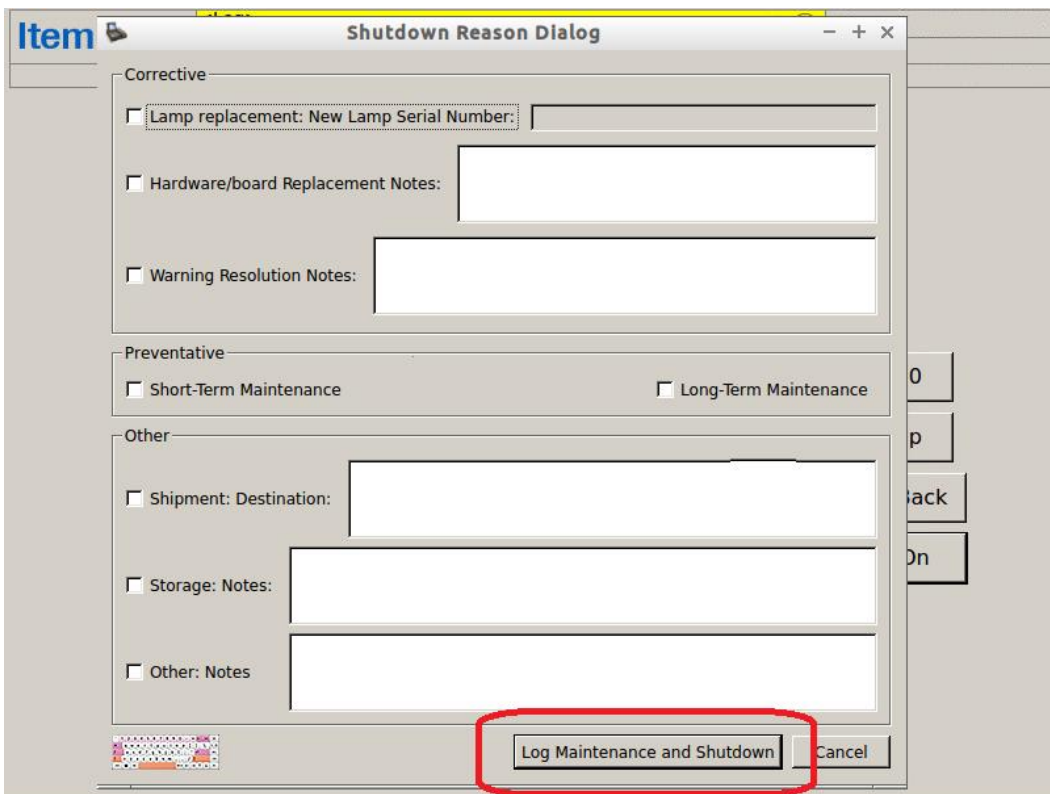
1. Resolve any warnings.
2. Press the **Log Off** button.
The screen displays a message that asks if you are certain you want to log off.
3. Press **Yes**.
The device logs you off, and displays the *User Log On...* window.

4. Press the **Shutdown** button:



The screen displays the *Shutdown Reason Dialog* window.

5. Select the check box that corresponds to the reason you are shutting down the device. Note that you can select more than one check box.
6. Enter a comment or additional information in the fields provided. Entering complete information can provide technical support staff in diagnosing and solving problems.
7. Press **Log Maintenance and Shutdown**:



8. Wait for the screen to display a blank white window.
9. Press the power button on the rear panel of the device.

The LED on the power button goes out.

This completes the procedure.

Remove the Desorber and Nozzle

To remove the desorber and nozzle:

1. Ensure that power to the device is turned off, and that the device has had at least 30 minutes to cool down.



WARNING

When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

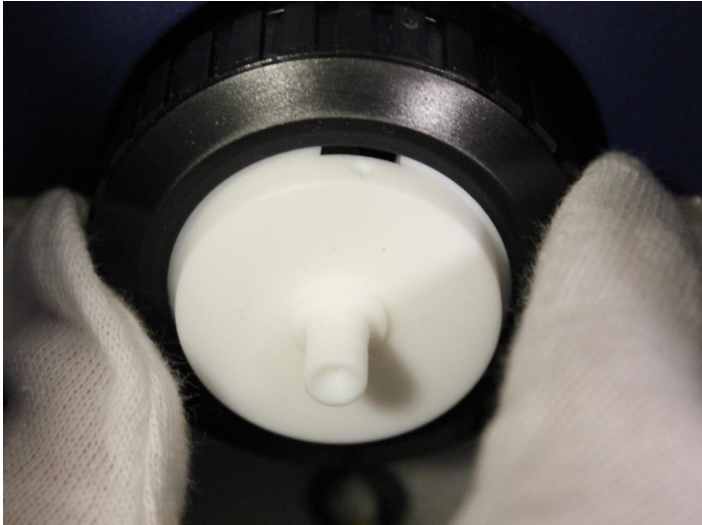
Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

2. Open the front panel door.
3. Grasp the lower portion of the desorber. Do not touch the upper portion of the desorber (it is very hot).
4. Gently pull the desorber straight out of the device:



5. Set the desorber on a clean surface.

6. Turn the nozzle ring nut counter-clockwise until it is free of the device.



7. Remove the nozzle ring nut. Typically the nozzle comes off when you remove the nozzle ring nut. If it does not, gently pull it toward you and remove it from the device.
8. Set the nozzle and nozzle ring nut on a clean surface.

This completes the procedure.

Check the Interface O-Ring

The next step in the maintenance procedure is to check the interface O-ring.



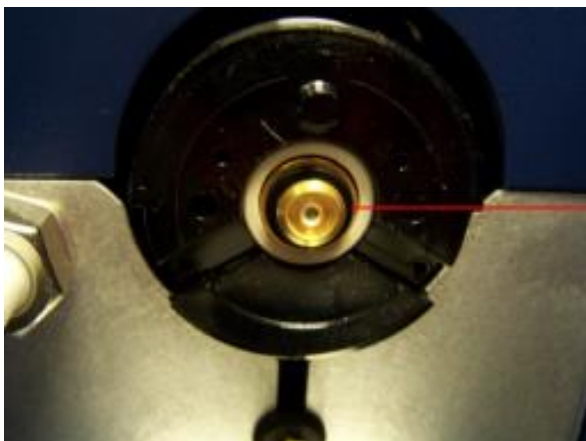
WARNING

When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

To check the interface O-ring:

1. Inspect the interface O-ring for cracks or damage.
2. If the O-ring is cracked, dry, or otherwise damaged, replace it:
 - Use the membrane tool to remove the old O-ring.
 - Use an alcohol wipe to clean the O-ring seating area
 - Take a new O-ring from the package and gently slip it into place. Make sure that it is properly seated.



**Interface
O-ring**

This completes the procedure.

Replace the Mesh Screen

To replace the mesh screen:

1. Ensure that power to the device is turned off, and that the device has had at least 30 minutes to cool down.

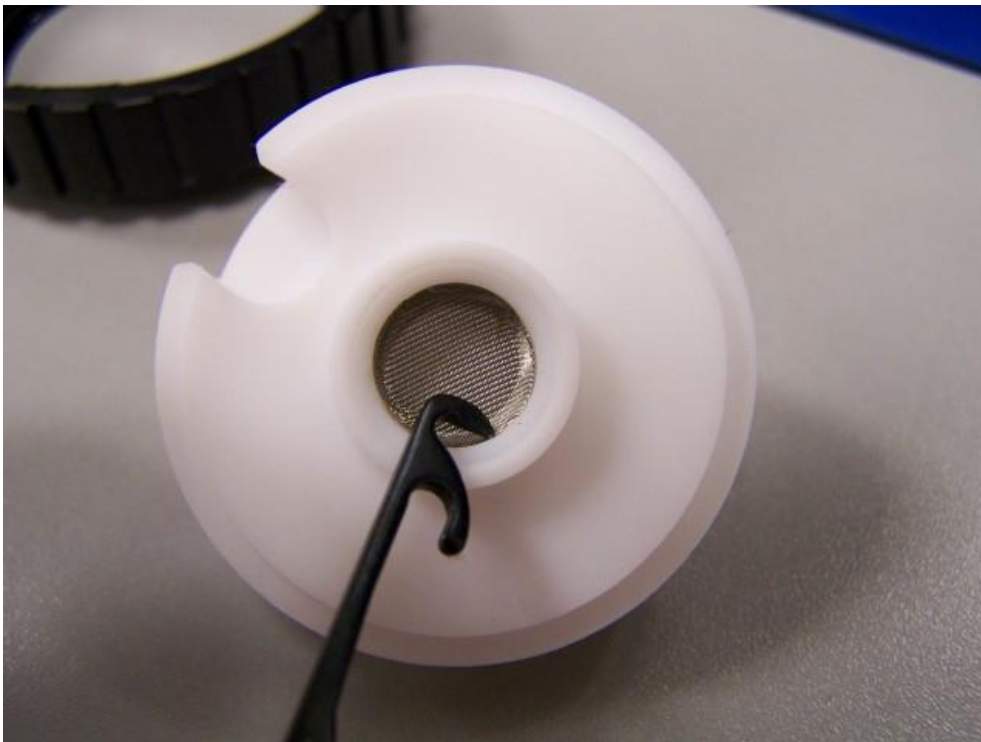


WARNING

When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

2. Remove the desorber, nozzle ring nut, and nozzle (if you have not already done so).
 3. Locate the mesh screen (it is inside the nozzle).
 4. Unscrew the cover on the mesh screen tool.
 5. Use the metal hook on the end of the mesh screen tool to pull the mesh screen out of the nozzle.
- Alternatively, insert a clean, blunt object (for example, a bent paper clip) into the hole on the other side of the nozzle and gently push the mesh screen out.



6. Discard the mesh screen.

7. Use the canless air to blow out dust and dirt from the nozzle, including the center where the mesh screen sits.



8. Use a Rapiscan Systems-approved alcohol swab to gently clean the area of the nozzle where the mesh screen sits.



9. Remove a new mesh screen from its package, holding it by its edge.

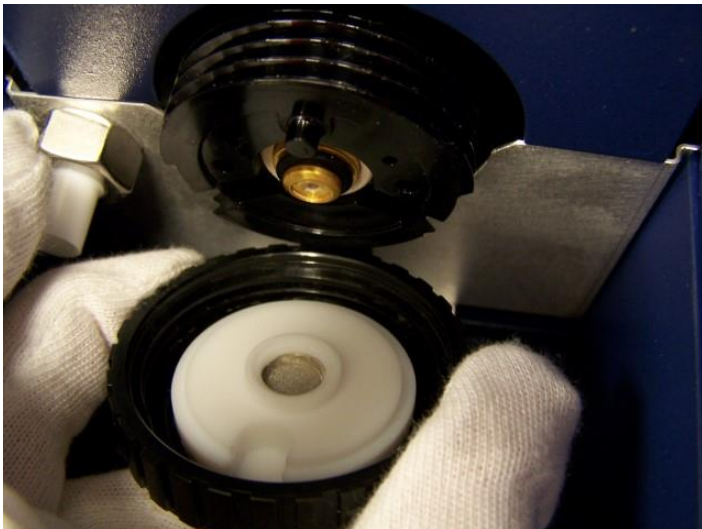
10. Place the new mesh screen into the nozzle and use the mesh screen tool or the membrane tool to push it into place. Make sure the mesh screen is sitting flush inside the nozzle.



11. Put the nozzle ring nut onto the detector interface. Be sure the notch on the nozzle lines up with the pin on the detector interface.

**CAUTION**

It is very important that the nozzle and nozzle ring nut are aligned correctly with the detector interface.



12. Tighten the nozzle ring nut until it is finger tight.



CAUTION Do not over-tighten the nozzle ring nut. Never use a tool—use only your fingers.

This completes the procedure.

Clean the Desorber

To clean the desorber:

1. Ensure that power to the device is turned off, and that the device has had at least 30 minutes to cool down.



WARNING

When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

2. Place the nozzle of the canless air device over the desorber slot, but do not touch the desorber with the nozzle.



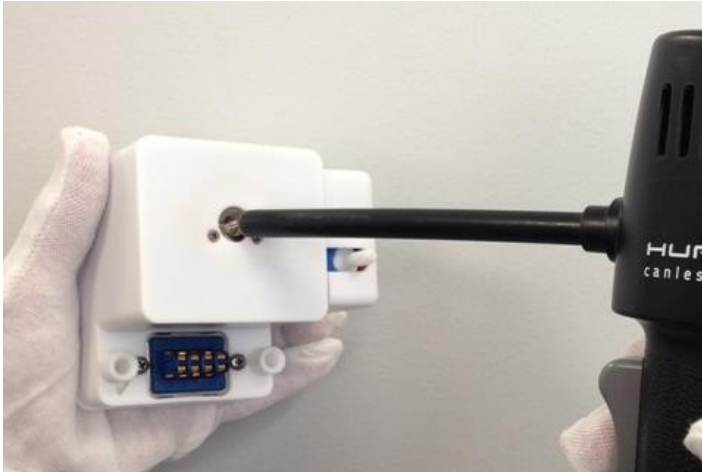
WARNING

Never touch the desorber with the nozzle of the canless air device, or insert the nozzle into the desorber slot. This can melt the nozzle and damage the desorber.

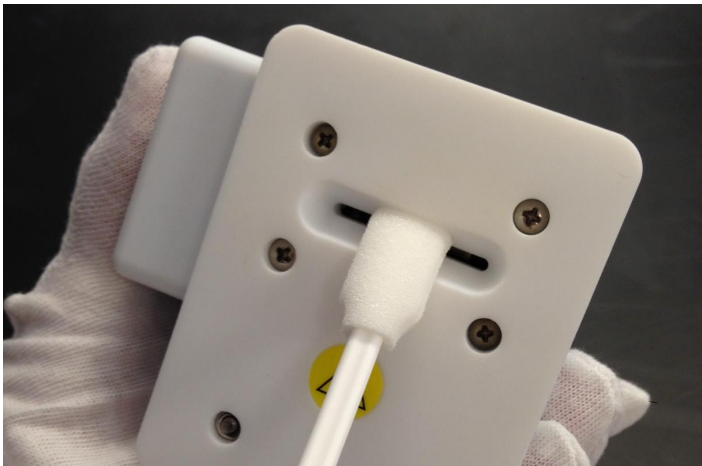
3. Blow out any accumulated dust and lint.



4. Blow out the hole in the rear of the desorber with several blasts of air.



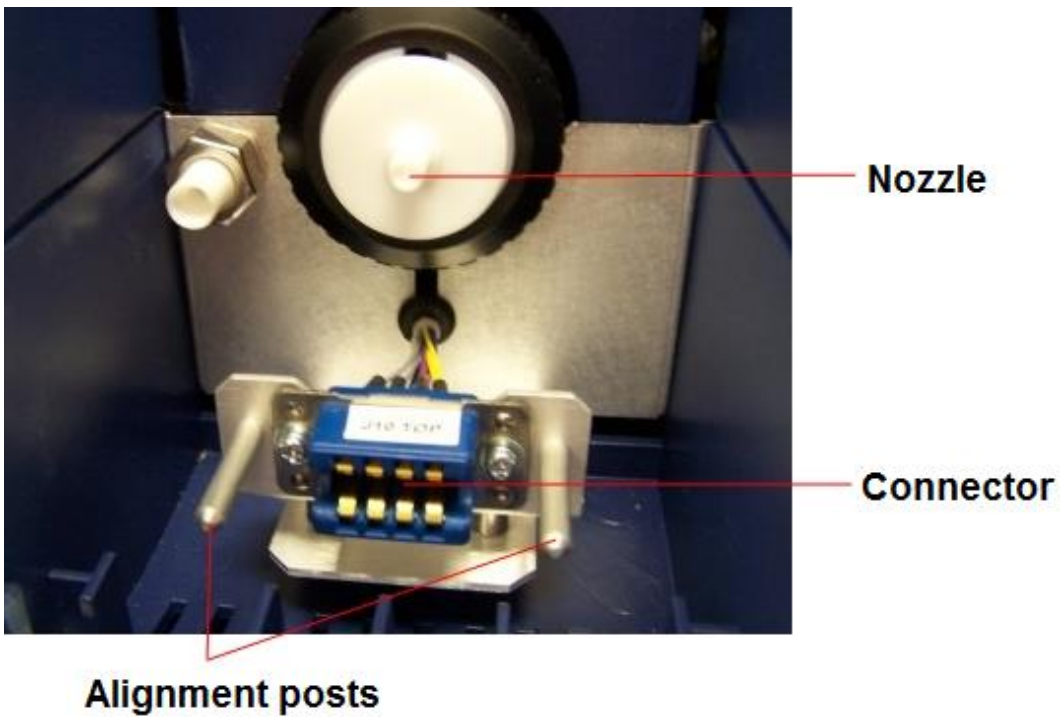
5. Thoroughly clean the desorber slot with an alcohol swab:



6. Clean the hole in the rear of the desorber with an alcohol swab:



7. Install the desorber. Use the two alignment posts and make sure the connector is seated properly.



8. Close the front panel.
This completes the procedure.

Power On the Device

To turn on power to the device:

1. Press the power button on the rear panel.
The green LED on the power button lights up.
2. Wait for the device to display the *Log Maintenance* window.
3. Select the check boxes corresponding to the maintenance you performed.
4. (Optional) Add comments or other information in the **Notes** field.
5. Press **Save**:

6. The screen displays the log-on window.
7. Log on to the device.
8. Wait for the *Stabilizing* timer to count down to 0:00.

This may take from five minutes up to half an hour, depending on how long power to the device was off.

The screen displays the *No Alarm-Ready* message when the device is fully warmed up.

This completes the procedure.

Calibrate the Pumps and Flows

Calibrate the pumps and flows ([see "Calibrate Pumps and Flows" on page 1](#)).

Perform an Internal Calibration

To perform an internal calibration:

1. Press **Menu** → **Internal Calibrate**.

The screen displays a message to ask if you want to perform an internal calibration.

2. Press **Yes**.

The status bar displays the *Sampling* message to indicate that the device is performing the internal calibration procedure.

When the device has completed the calibration procedure, the screen displays a message that the internal calibration was successful.

3. Press **OK**.

The screen displays the main window.

If the screen displays a message that indicates the calibration process failed, perform either of the following:

- Repeat the internal calibration procedure.
- Perform the external calibration procedure ([see "External Calibrate" on page 89](#)).

This completes the procedure.

Return to Operation

To return the device to operation:

1. Log each maintenance procedure you performed using either of the following methods:
 - Use the Rapiscan Systems maintenance log pages ([see "Maintenance Logs" on page 229](#)).
 - Add a maintenance log entry to the device log ([see "Log Maintenance" on page 110](#)).
2. Return the device to operation following your organization's procedures.

When the screen displays the *No Alarm - Ready* message, the device is ready for operation.

This completes the procedure.

Six-Month Maintenance

To keep the device operating at peak performance, perform the procedures listed in this section every six months. Perform the procedures in the order listed:

1. Log off, and shut down the device.
2. Remove the desorber and nozzle.
3. Check the interface O-ring.
4. Replace the mesh screen.
5. Check the positive ion dopant, and replace if necessary.
6. Check the negative ion dopant, and replace if necessary.
7. Clean the desorber.
8. Power on the device.
9. Calibrate the pumps and flows.
10. Perform the internal calibration procedure.
11. Return the device to operation.
12. Log all maintenance procedures.

**NOTE**

When maintaining the device, you must wear clean, powder-free gloves and use only Rapiscan Systems-supplied consumables, parts, and supplies.

Log Off and Shut Down

Log off and shut down the device ([see "Log Off" on page 43](#))

Remove the Desorber and Nozzle

Remove the desorber and nozzle ([see "Remove the Desorber and Nozzle" on page 192](#)).

Check the Interface O-Ring

Check the interface O-ring ([see "Check the Interface O-Ring" on page 194](#)).

Replace the Mesh Screen

The next step is to replace the mesh screen ([see "Replace the Mesh Screen" on page 195](#)).

Check the Positive Ion Dopant

The next step in the six-month maintenance routine is to check (and if necessary, replace) the positive ion dopant.

To check the positive ion dopant:

1. Push down on the latch of the rear panel door and swing it open.
2. Remove the (+) **DOPANT** chamber end cap on the rear panel. Pull the cap straight out (it may help to turn it from side to side as you pull it out).
3. Place the chamber end cap on a clean surface.
4. Place one hand over the (+) **DOPANT** chamber.
5. With your other hand, grasp the carry handle on the front of the device, and gently lift. As you tip the device, the dopant tube slides out of the chamber. Be sure to handle the dopant tube only by the ends.



6. Visually inspect the substance level in the dopant tube.
7. If there is at least 1/8" (3mm) of powder remaining in the dopant tube, insert it back into the chamber with the recessed end facing out. Skip to step 9.

8. If there is less than 1/8" (3mm) of powder remaining in the dopant tube:
 - a. Obtain a new + **DOPANT** tube.
 - b. Discard the empty dopant tube in accordance with all applicable regulatory requirements.
 - c. Allow the dopant tube to come to room temperature.
 - d. Clean the dopant tube with an alcohol wipe.
 - e. Insert the dopant tube into the chamber with the end cap facing out.
9. Inspect the O-ring on the chamber end cap for damage, and replace it if necessary.
10. Install the (+) **DOPANT** chamber end cap. Push the cap straight in (it may help to turn it from side to side as you push it in).
11. Close the rear panel door; ensure that it is securely latched.

**CAUTION**

Be sure to insert the dopant tube end cap fully, and make sure it is seated correctly. If you do not, it may adversely affect the ability of the device to function properly.

12. If you replaced the + **DOPANT** tube, wait 30 minutes before you return the device to operation. This is necessary for the new dopants to permeate into the device.

This completes the procedure.

Check the Negative Ion Dopant

The next step in the six-month maintenance routine is to check (and if necessary, replace) the negative ion dopant.

To check the negative ion dopant:

1. Push down on the latch of the rear panel door and swing it open.
2. Remove the (-) **DOPANT** chamber end cap on the rear panel. Pull the cap straight out (it may help to turn it from side to side as you pull it out).
3. Place the chamber end cap on a clean surface.
4. Place one hand over the (-) **DOPANT** chamber.

5. With your other hand, grasp the carry handle on the front of the device, and gently lift. As you tip the device, the dopant tube slides out of the chamber. Be sure to handle the dopant tube only by the ends.



6. Hold the dopant tube near your ear, and gently shake it.
7. If you can hear liquid moving in the dopant tube, insert it back into the chamber with the metal cap facing out. Skip to step 8.
8. If you cannot hear liquid moving in the dopant tube:
 - a. Obtain a new (-) **DOPANT** tube.
 - b. Discard the empty dopant tube in accordance with all applicable regulatory requirements.
 - c. Allow the dopant tube to come to room temperature.
 - d. Clean the dopant tube with an alcohol wipe.
 - e. Insert the dopant tube into the chamber with the metal cap facing out.
9. Inspect the O-ring on the chamber end cap for damage, and replace it if necessary.
10. Install the (-) **DOPANT** chamber end cap. Push the cap straight in (it may help to turn it from side to side as you push it in).
11. Close the rear panel door; ensure that it is securely latched.



CAUTION

Be sure to insert the dopant tube end cap fully, and make sure it is seated correctly. If you do not, it may adversely affect the ability of the device to function properly.

12. If you replaced the (-) **DOPANT** tube, wait 30 minutes before you return the device to operation. This is necessary for the new dopants to permeate into the device.

This completes the procedure.

Clean the Desorber

Clean the desorber ([see "Clean the Desorber" on page 198](#)).

Power On the Device

Power on the device ([see "Power On the Device" on page 201](#)).

Calibrate the Pumps and Flows

Calibrate the pumps and flows ([see "Calibrate Pumps and Flows" on page 1](#)).

Perform an Internal Calibration

To perform an internal calibration:

1. Press **Menu** → **Internal Calibrate**.

The screen displays a message to ask if you want to perform an internal calibration.

2. Press **Yes**.

The status bar displays the *Sampling* message to indicate that the device is performing the internal calibration procedure.

When the device has completed the calibration procedure, the screen displays a message that the internal calibration was successful.

3. Press **OK**.

The screen displays the main window.

If the screen displays a message that indicates the calibration process failed, perform either of the following:

- Repeat the internal calibration procedure.
- Perform the external calibration procedure ([see "External Calibrate" on page 89](#)).

This completes the procedure.

Return to Operation

To return the device to operation:

1. Log each maintenance procedure you performed using either of the following methods:
 - Use the Rapiscan Systems maintenance log pages ([see "Maintenance Logs" on page 229](#)).
 - Add a maintenance log entry to the device log ([see "Log Maintenance" on page 110](#)).
2. Return the device to operation following your organization's procedures.

When the screen displays the *No Alarm - Ready* message, the device is ready for operation.

This completes the procedure.

As-Needed Maintenance

To keep the device operating at peak performance, perform the following procedures whenever they are required:

1. Check and install printer paper.
2. Clean the touchscreen and the device housing.
3. Check the supply of consumables.
4. Calibrate the touchscreen.
5. Replace the lamp.
6. Replace the detector and dryer purge inlet filters.
7. Return the device to operation.
8. Log all maintenance activities you performed.

If the device is located in a particularly dusty environment, or if it sees heavy use, you might also need to clean the desorber more frequently than once per month ([see "Clean the Desorber" on page 198](#)).



NOTE

When maintaining the device, you must wear clean, powder-free gloves and use only Rapiscan Systems-supplied consumables, parts, and supplies.

Install Printer Paper

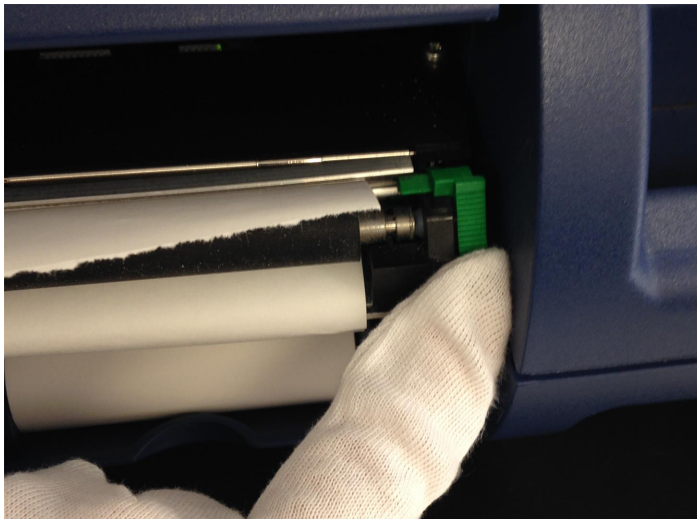
To install a new roll of printer paper:

1. Open the printer door.
2. Observe the right edge of the printer paper:

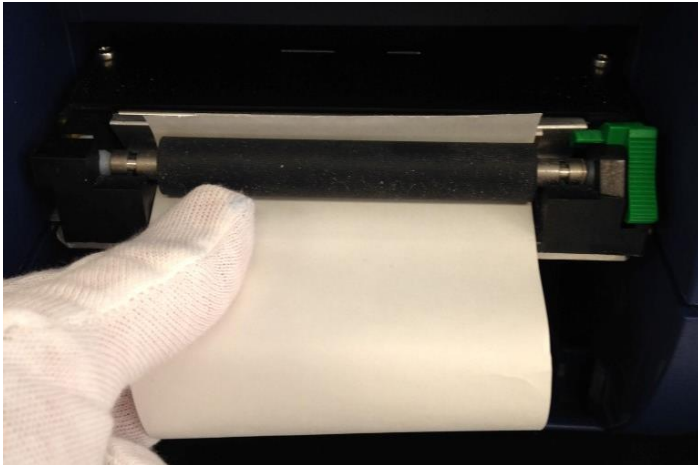
- If you can see a colored mark on the paper, continue with the rest of this procedure to install a new roll of printer paper.
 - If you do not see a colored mark on the paper, the supply of paper is sufficient, and you can skip the remainder of this procedure.
3. Install a roll of paper in the holder as shown. Scratch the paper surface with a fingernail; if it leaves a mark, that is the correct side to face up.



4. Push the bottom of the green lever to release the paper tension bar.



5. Feed the paper through the slot from under the roller.



6. Pull out approximately 6 inches of paper.
7. Toggle the green lever to engage the tension bar.
8. Feed the paper through the slot in the printer door.
9. Close the printer door.

This completes the procedure.

Clean the Exterior of the Device

To clean the exterior of the device:

1. Log off the device (it is not necessary to shut it down)
2. Clean the touchscreen with the isopropyl alcohol wipes provided.
3. Inspect the touchscreen for any signs of physical damage that would impair its operation. If you notice any damage, contact your supervisor and discontinue use of the device.
4. Clean the device housing with the isopropyl alcohol wipes provided.

This completes the procedure.

Check the Supply of Consumables

It is important always to have a sufficient quantity of consumables on hand.

1. Check for sufficient supplies of:
 - Sample traps
 - Calibration traps
 - Verification traps
 - Dopants
 - Lamps
 - A sufficient supply of clean, powder-free gloves
2. Verify that the sample, calibration, and verification traps are within the *Best Used By* date.
Contact Rapiscan Systems customer service to order consumables ([see "Customer Service " on page 235](#)).

This completes the procedure.

Calibrate the Touchscreen

Calibrate the touchscreen ([see "Calibrate Touchscreen" on page 82](#)).

Replace the Lamp

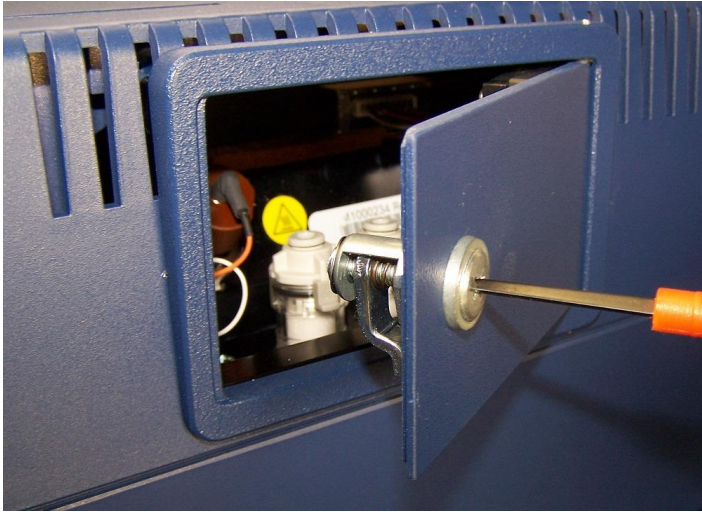
Follow the procedure described in this section to replace the lamp when the screen displays the *Lamp Warning* message, and the *Lamp Failed* message in the warning detail screen.

Note that you can use the hot-swap procedure when you need to replace the lamp and return the device to operational service as quickly as possible ([see "Replace the Lamp \(Hot Swap\)" on page 217](#)).

To replace the lamp:

1. Log off, and shut down the device.
2. Allow the device to cool for at least 15 minutes.

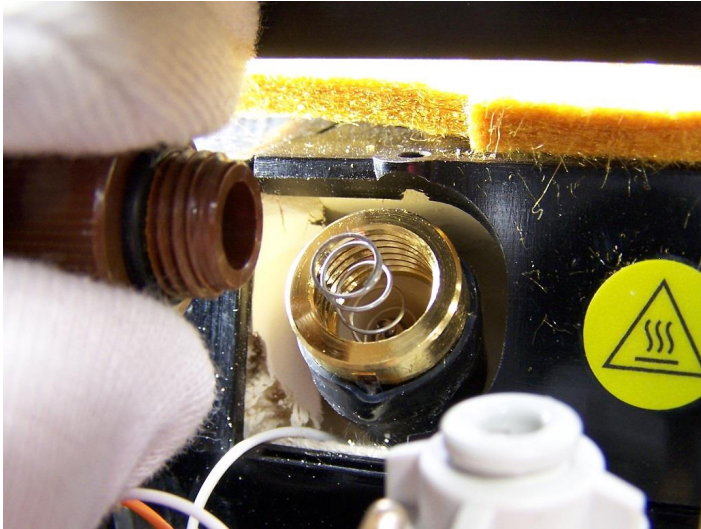
3. Use the end of the lamp removal tool to open the side panel door.



4. Put on clean, powder-free gloves.
5. Pull the lamp connector upward to unplug it.



6. Unscrew the lamp holder cap.



7. Remove the lamp electrode-spring assembly.



8. Insert the lamp removal tool onto the lamp and lift out the lamp.



9. Remove the lamp from the end of the lamp removal tool. Note that you should not discard the lamp if you are required to generate an RMA.
10. Remove a new lamp from its packaging.



CAUTION

Never handle the lamp with your bare hands—always wear clean, powder-free gloves. If you handle the lamp with your bare hands, you might damage the lamp or significantly reduce its life.



11. (Optional) Log the serial number of the replacement lamp in the maintenance log or add a maintenance log to the history ([see "Adding a Maintenance Log Entry" on page 98](#)).
12. Clean the new lamp, particularly the flat lens, with an alcohol wipe.

13. Install the lamp into the lamp chamber; put the flat lens of the lamp in first.



14. Install the lamp electrode-spring assembly into the lamp chamber; put the electrode (gold) end of the assembly in first.
15. Verify that you have inserted the lamp and lamp electrode/spring assembly in the correct orientation, and in the correct order.



16. Verify that the O-ring on the lamp holder cap is undamaged and installed correctly.
17. Screw the lamp holder cap clockwise onto the lamp chamber until the O-ring bottoms out on the chamber.

**CAUTION**

Do not over-tighten the lamp holder cap. If you do so, you might damage the cap or the detector, and negatively affect the operation of the device.

18. Connect the lamp connector to the top of the lamp holder cap.



19. Close the side panel door and use the screwdriver end of the lamp removal tool to latch the door (turn the tool 1/4 turn clockwise).
20. Power on the device (*see "Powering On the Device" on page 248*).
21. Calibrate the pumps and flows (*see "Calibrating Pumps and Flows" on page 1*).
22. Perform the internal calibration procedure (*see "Internal Calibrate" on page 107*).

The device is now ready for operation.

**NOTE**

If the device does not display the No Alarm - Ready message, contact Rapiscan Systems technical support (*see "Technical Support" on page 1*).

Follow your organization's procedures for beginning operations with the Itemiser® 4DX
This completes the procedure.

Replace the Lamp (Hot Swap)

Follow this procedure when you need to replace the lamp and return the device to operational service as quickly as possible:

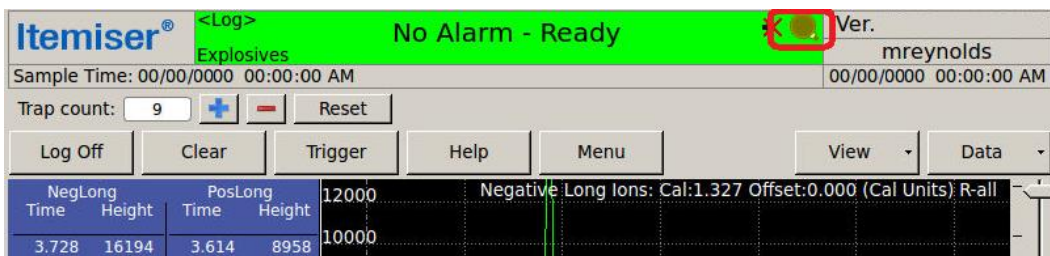


WARNING

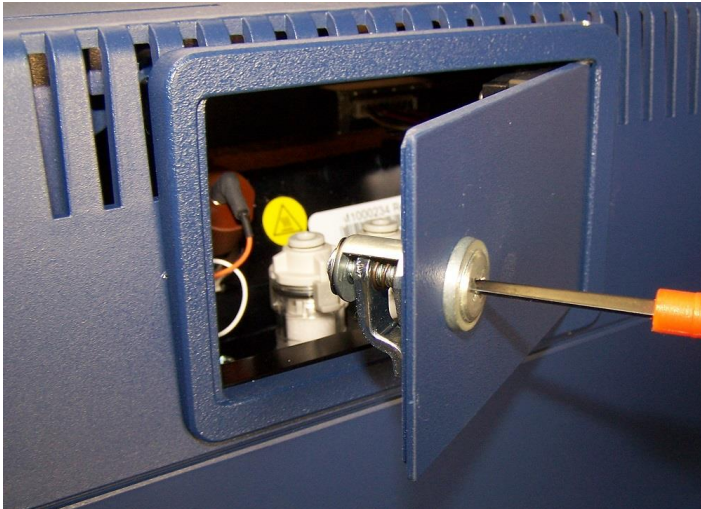
When the Itemiser® 4DX is at its normal operating temperature, components and areas inside the device can reach extremely high temperatures.

Be extremely careful when working on or near hot surfaces. If possible, wear gloves that provide protection against high temperatures.

1. Press **Menu** → **Toggle Lamp**.
2. Verify that the lamp indicator is gray (indicating that the lamp is off):



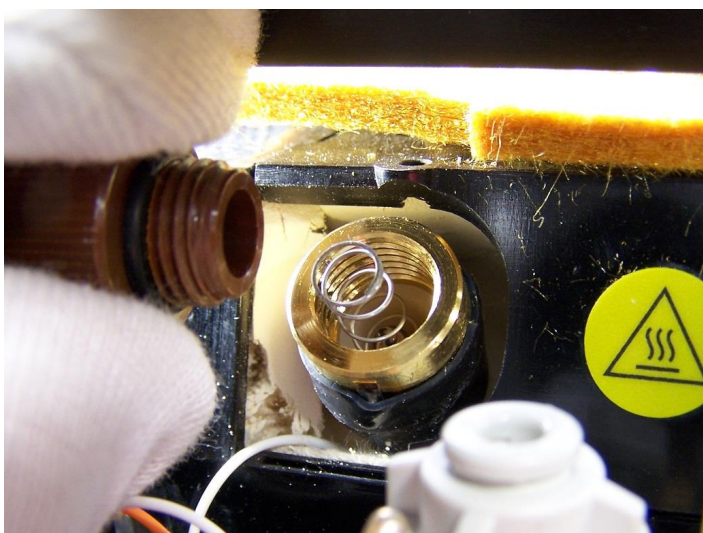
3. Use the end of the lamp removal tool to open the side panel door.



4. Put on clean, powder-free gloves.
5. Pull the lamp connector upward to unplug it.



6. Unscrew the lamp holder cap.



NOTE

If the lamp holder cap is tightened too tightly for you to remove it, allow the device to cool for a further 30 minutes. You should now be able to remove the cap; if you cannot, contact your maintenance staff or Rapiscan Systems technical support.

7. Remove the lamp electrode-spring assembly.



8. Insert the lamp removal tool onto the lamp and lift out the lamp.



9. Remove the lamp from the end of the lamp removal tool. Note that you should not discard the lamp if you are required to generate an RMA.
10. Remove a new lamp from its packaging.



CAUTION

Never handle the lamp with your bare hands—always wear clean, powder-free gloves. If you handle the lamp with your bare hands, you might damage the lamp or significantly reduce its life.



11. (Optional) Log the serial number of the replacement lamp in the maintenance log or add a maintenance log to the history ([see "Adding a Maintenance Log Entry" on page 98](#)).
12. Clean the new lamp, particularly the flat lens, with an alcohol wipe.
13. Install the lamp into the lamp chamber; put the flat lens of the lamp in first.



14. Install the lamp electrode-spring assembly into the lamp chamber; put the electrode (gold) end of the assembly in first.
15. Verify that you have inserted the lamp and lamp electrode-spring assembly in the correct orientation, and in the correct order.



16. Verify that the O-ring on the lamp holder cap is undamaged and installed correctly.
17. Screw the lamp holder cap clockwise onto the lamp chamber until the O-ring bottoms out on the chamber.

**CAUTION**

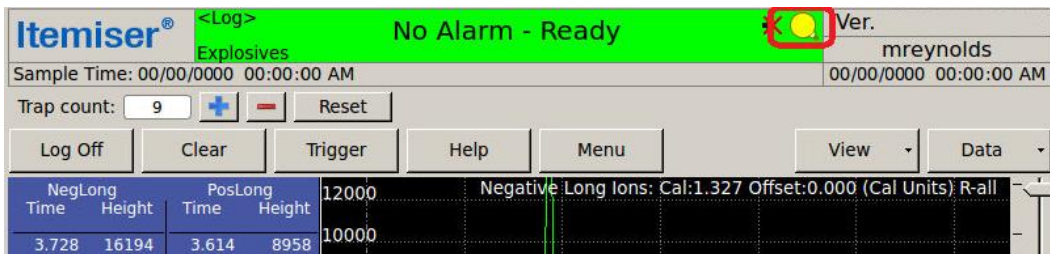
Do not over-tighten the lamp holder cap. If you do so, you might damage the cap or the detector, and negatively affect the operation of the device.

18. Connect the lamp connector to the top of the lamp holder cap.



19. Close the side panel door and use the screwdriver end of the lamp removal tool to latch the door (turn the tool 1/4 turn clockwise).
20. Press **Menu** → **Toggle Lamp**.

21. Verify that the lamp indicator is yellow (indicating that the lamp is on):



22. Wait 10 minutes for the device to stabilize.

23. Press **Trigger**.

24. Observe the screen display, and proceed accordingly:

- If the screen displays the *No Alarm - Ready* message, continue to the next step (calibrating the device).
- If the screen instead displays a warning message, resolve the warning following standard procedures. Once you have resolved the warning, continue to the next step (calibrating the device).

25. Press **Menu** → **Internal Calibrate**.

The screen displays a message to ask if you want to perform an internal calibration.

26. Press **Yes**.

The status bar displays the *Sampling* message to indicate that the device is performing the internal calibration procedure.

When the device has completed the calibration procedure, the screen displays a message that the internal calibration was successful.

27. Press **OK**.

The device displays the main screen.

28. Press the **Clear** button.

The device displays the *No Alarm - Ready* message.

The device is now ready for operation.



NOTE

If the device does not display the *No Alarm - Ready* message, contact Rapiscan Systems technical support ([see "Technical Support" on page 234](#)).

Follow your organization's procedures for resuming operations with the Itemiser® 4DX.

This completes the procedure.

Replace the Inlet Filters

To check (and if necessary, replace) the detector and dryer purge inlet filters:

1. Use the end of the lamp removal tool to open the side panel door.



2. Check the color of both filters. Replace any filter that appears dirty (dirty filters appear brown or gray, while clean filters are white).



3. To replace a filter, pull up to remove the filter housing.



4. Push down on the gray latch to open the filter housing.



5. Remove the dirty filter and replace it with a new one.



6. Close the filter housing
7. Re-install the filter. Be sure to push it down until it is fully seated.
8. Close the side panel door.
9. Power on the device (*see "Powering On the Device" on page 248*).
10. Calibrate the pumps and flows (*see "Calibrating Pumps and Flows" on page 1*).
11. Perform a manual internal calibration (*see "Internal Calibrate" on page 107*).

This completes the procedure.

Maintenance Reminders

Maintenance- and administrator-level users can configure the Itemiser® 4DX to automatically display reminders that maintenance is due:

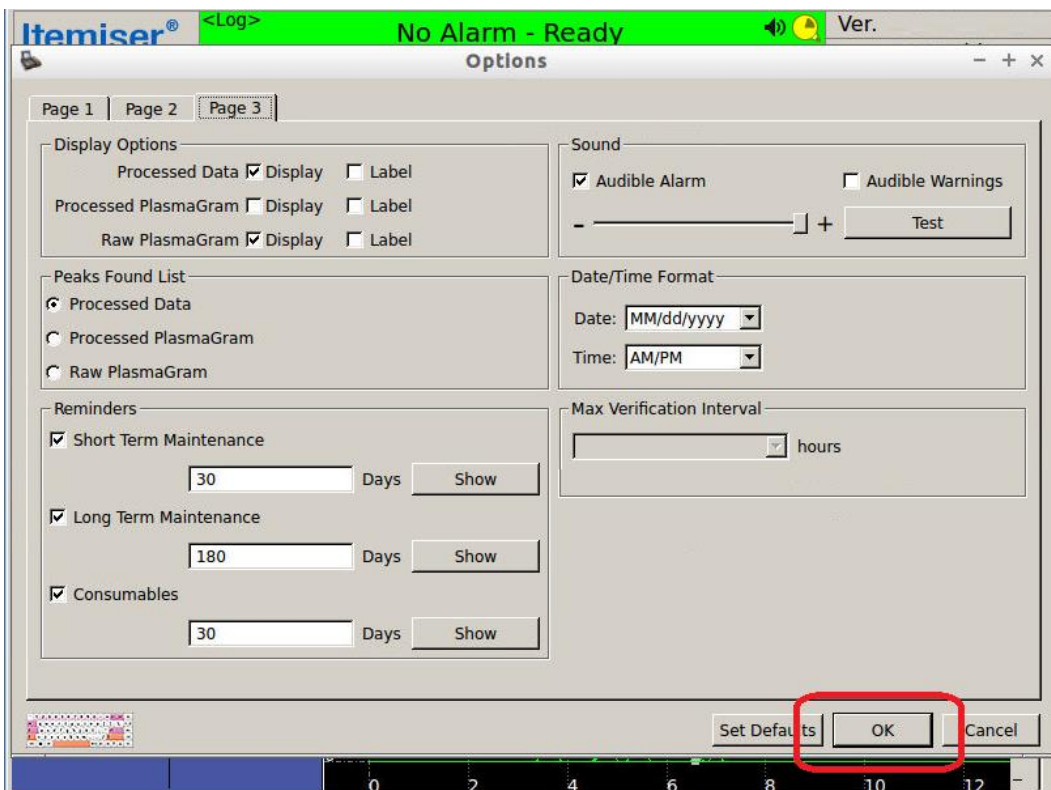
1. Press **Menu** → **Options**.

The screen displays the *Options* window.

2. Press the **Page 3** tab.

The screen brings it to the front.

3. In the *Reminders* section of the window, select the check box for each type of maintenance reminder you want the device to display (short-term maintenance, long-term maintenance, consumables).
4. Enter the interval that you want for each reminder (for example, if you enter **30**, the device displays the reminder every 30 days).
5. (Optional) To view any reminder, press the corresponding **Show** button.
6. Press **OK**:



The screen displays the main window.

This completes the procedure.

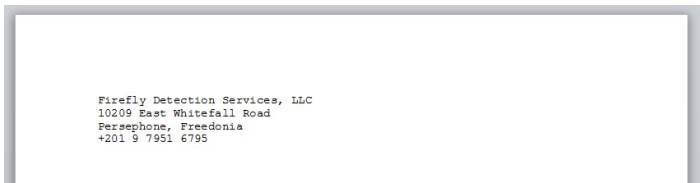
Adding Dealer Contact Information

Authorized dealers can add their name and contact information to the consumables reminder that the Itemiser® 4DX displays to users.

This function is available only to administrator-level users.

To add dealer contact information:

1. On your personal computer, create a text file (.txt) or simple HTML file (.html).
2. Enter your company name, address, and other contact information as you want it to appear in the reminder (typically, each element on a separate line):



3. Save this file to a USB memory device.
4. Safely remove the USB memory device from your personal computer.
5. Log on to the Itemiser® 4DX .
6. Press **Alt + Z**.
The screen displays the *Update Consumables Reminder* window.
7. Press **Yes**.
The screen displays a window that asks you to insert the USB flash drive.
8. Insert the memory device into one of the USB slots on the rear panel of the device.
9. Press **Yes**.
The screen displays the *Select file* window.
10. Navigate to the file containing the contact information you want to add.
11. Press the file name.
12. Press **Open**.
The screen displays the *Update Successful* window.
13. Press **OK**.
The screen displays the main window.
14. Press **Menu → Safely Remove USB Hardware**.
15. Navigate to the entry corresponding to the USB device, and press it.
16. Press **Remove**.
The screen displays the *Remove USB Device* window.
17. Press **OK**.
The screen displays the main window.

18. Remove the USB device from the slot on the rear panel of the Itemiser® 4DX.

This completes the procedure.

If you want to verify that the contact information is correct:

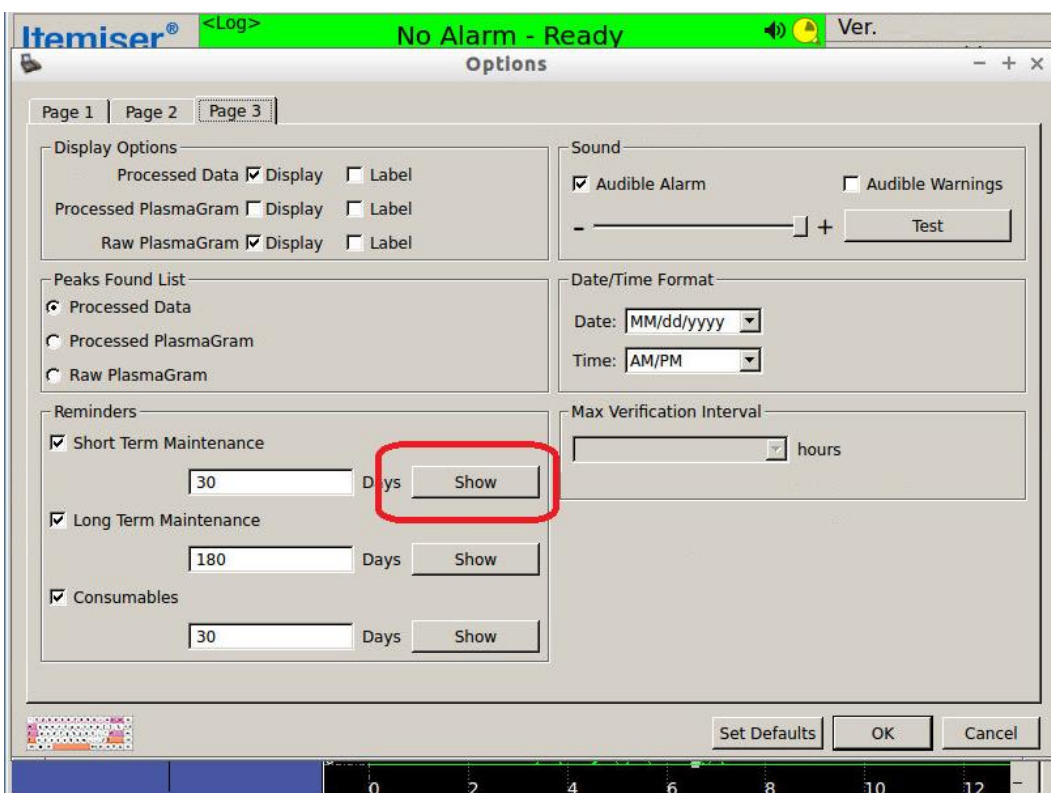
1. Press **Menu → Options**.

The screen displays the *Options* window.

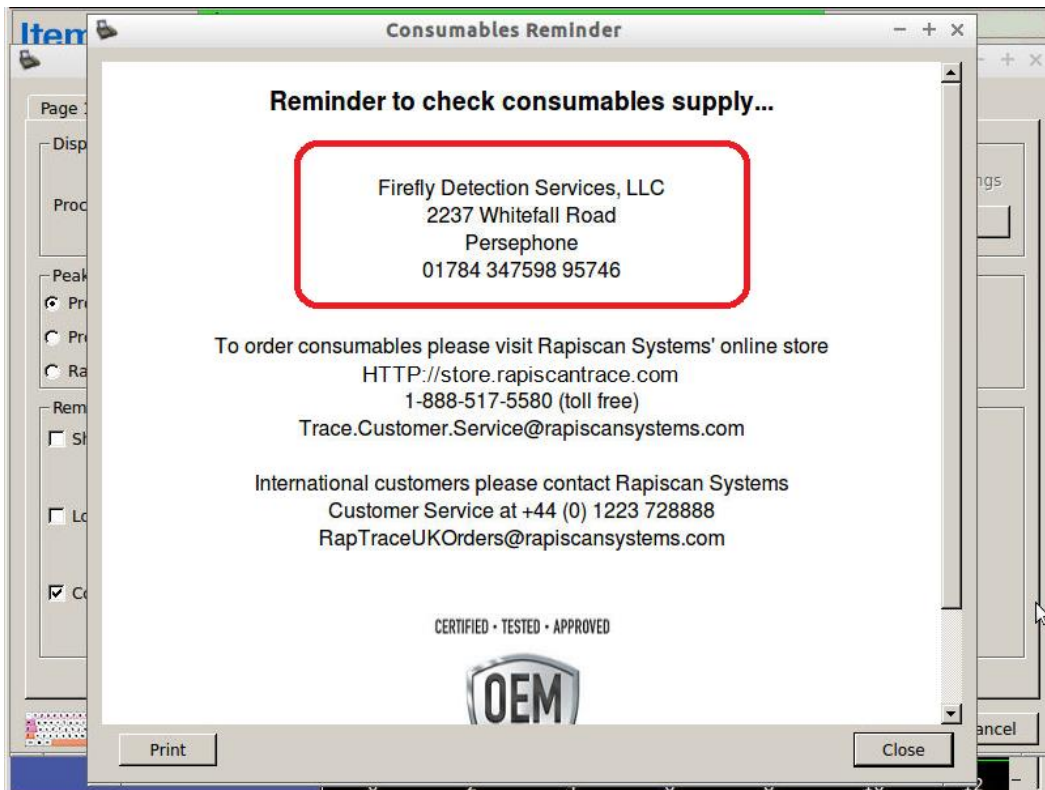
2. Press the **Page 3** tab.

The screen brings it to the front.

3. Press the **Show** button corresponding to the **Consumables** reminder:



The screen displays the reminder, with the contact information you added:



4. (Optional) To print a copy of the warning, press **Print**.
5. Press **Close**.

The screen displays the *Options* window.

6. Press **OK**.

The screen displays the main window.

This completes the procedure.

Maintenance Logs

The maintenance log form is one way to track when you have performed maintenance tasks.

You can also use the integral maintenance log entry function to track maintenance activities (*see "Adding a Maintenance Log Entry" on page 98*).

Monthly Maintenance Log

Always wear clean, powder-free gloves when you perform any maintenance procedure.
Perform maintenance tasks in the order listed.

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Check the interface O-ring; replace if necessary.												
Replace the mesh screen.												
Calibrate pumps and flows.												
Clean the desorber.												
Perform an internal calibration.												
Return the device to operation.												

Device location	
Device serial number	
Customer ID	

Six-Month Maintenance Log

Always wear clean, powder-free gloves when you perform any maintenance procedure.
Perform maintenance tasks in the order listed.

	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial
Check the interface O-ring; replace if necessary.								
Replace the mesh screen.								
Check the (+) dopant tube; replace if necessary.								
Check the (-) dopant tube; replace if necessary.								
Clean the desorber.								
Calibrate the pumps and flows.								
Perform an internal calibration.								
Return the device to operation.								

Device location	
Device serial number	
Customer ID	

As-Needed Maintenance Log

Always wear clean, powder-free gloves when you perform any maintenance procedure.
Perform maintenance tasks in the order listed.

	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial	Date/Initial
Check printer paper; install new roll if necessary.								
Clean the exterior of the device.								
Check the supply of consumables; order additional consumables if necessary.								
Calibrate the touchscreen.								
Replace the lamp.								
Check the detector and dryer purge inlet filters; replace if necessary.								

Device location	
Device serial number	
Customer ID	

APPENDIX A

Service and Support

Technical Support	234
Customer Service	235
Consumables	235
Warranty Information	235
Rapiscan Systems Locations	236
International Locations	236

Technical Support

To contact Rapiscan Systems Technical Support:

Table 6-1 *Technical Support Contact Information*

Location	Telephone	Email
Americas	1 888 258 6684 1 310 349 2477	RapCSCallCenter@rapiscansystems.com
Europe	+44 0870 777 4301 (from 8:30 AM to 5:00 PM GST)	ukservice@rapiscansystems.com
Middle East and Africa	+44 0870 777 4301	rapmeso@rapiscansystems.com
UAE	+44 0870 777 4301	rssupport@rapiscansystems.com
Asia and Pacific		
Australia	1800 147 174	rssupport@rapiscansystems.com
India	1 800 108 7499	rssupport@rapiscansystems.com
Indonesia	001803 017 3884	rssupport@rapiscansystems.com
Malaysia and Philippines	800 456 08560	rssupport@rapiscansystems.com
New Zealand	0800 455 159	rssupport@rapiscansystems.com
Vietnam	122 80 308	rssupport@rapiscansystems.com

Hours of operation are 24 hours a day, 7 days a week, unless noted otherwise.

Customer Service

To contact Rapiscan Systems Customer Service:

Table 6-2 *Customer Service Contact Information*

Location	Telephone	Email
Americas	1 866 517 5580 1 978 658 3767 (from 8:30 AM to 5:00 PM ET)	Trace.Customer.Service@rapiscansystems.com
Australia	1 800 147 174 (from 9:00 AM to 5:00 PM AEST)	RapTraceAustraliaService@rapiscansystems.com
All other countries	+44 (0) 1223 728888 (from 8:30 AM to 5:00 PM GST)	RapTraceUKCustomerService@rapiscansystems.com

Consumables

Order consumables from Rapiscan Systems Customer Service or by shopping online at [HTTP://store.rapiscantrace.com](http://store.rapiscantrace.com).

Rapiscan Systems strongly recommends that you use only Rapiscan Systems-supplied and approved consumables with the Itemiser® 4DX. Rapiscan Systems is not liable for damage to, or malfunction of, the device that it deems was caused by the use of unauthorized materials.

Some consumables have a limited shelf life. For assistance in ordering consumables to ensure that materials are within their acceptable shelf life, contact Rapiscan Systems Customer Service (*see "Customer Service " above*).

Warranty Information

For information on your warranty, refer to the *Terms and Conditions* of your equipment purchase order.

Rapiscan Systems Locations

23 Frontage Road
Andover, MA 01810
+1 800 433 5346

2805 Columbia Street
Torrance, CA 90503
+1 310 978 1457

International Locations

Granary House, Station Road
Great Shelford, Cambridge
CB22 5LR, UK
Tel: +44 (0) 1223 728888
Fax: +44 (0) 1223 728889

Unit C3, 57 Rothschild Avenue
Rosebery NSW 2018 Australia
Tel: +61 2 9962 5710
Fax: +61 2 9424 3540

APPENDIX B

Installation

Overview	238
Preparing the Location	238
Receiving the Device	239
Unpacking the Components	239
Installing the Dopants and Calibrant	240
Installing the Lamp	244
Powering On the Device	248
Logging On (Initial)	250

Overview

This chapter describes how to receive the Itemiser® 4DX and prepare it for operational use.

Depending on the services your organization has contracted for, the procedures in this chapter may be either your responsibility or the responsibility of a certified technical support technician.

In either case, you are responsible for selecting and preparing a suitable location for the device.

If preparing the Itemiser® 4DX is your responsibility, you must perform all the procedures described here before you begin operations:

1. Prepare the location.
2. Receive the device.
3. Unpack the device components.
4. Install the dopants and calibrant.
5. Install the lamp.
6. Power on the device.
7. Log on.
8. Perform a manual calibration.
9. Perform a verification.

Please contact Rapiscan Systems technical support if you require assistance with any of these procedures ([see "Technical Support" on page 234](#)).

Preparing the Location

You must prepare a suitable location for the Itemiser® 4DX and the associated materials:

1. Choose a location that meets your operational requirements.
2. Ensure that the location has a clean surface that is able to support the weight of the device, as well as space for supplies and accessories (a table or desktop with a washable surface is best).
3. Check to determine that the location has adequate electrical power available.
4. Choose a location that must meet the environmental requirements of the Itemiser® 4DX ([see "Device Specifications" on page 1](#)). Note that the device is not intended for use outdoors during inclement weather.

You must also prepare a storage facility for the consumables, packing materials, and other components.

Receiving the Device

Document and inspect the Itemiser® 4DX to ensure that the carrier has delivered it in an undamaged condition:

1. Make a note of the date and exact time that the carrier delivered the device.
2. Carefully examine the shipping case for any evidence of damage or mishandling. If possible, do this while the carrier is still present.
3. If you find or suspect any damage, contact the carrier immediately to request an inspection and for instructions on filing a claim. Most carriers require that you do this within a specified period of time.
4. Make detailed notes on the type, location, and extent of the damage. Take photos of the damage if possible.
5. Proceed immediately to the next step (*see "Unpacking the Components" below*), as it is possible that the device suffered shipping damage not readily noticeable from the outside.

If the device suffered damage during shipping, it is your responsibility to file a claim with the carrier.

Rapiscan Systems or your supplier is not responsible for such damage, and furnishes replacement parts only upon receipt of a written purchase order.

Unpacking the Components

Unpack and inspect the Itemiser® 4DX components even if you do not plan to begin using the device immediately:

1. Carefully unpack the device components from the shipping containers. Take care not to damage the shipping containers.
2. Place each component on a clean surface.
3. Inspect each component for damage.
4. If you find or suspect any damage, contact the carrier immediately to request an inspection and for instructions on filing a claim. Most carriers require that you do this within a specified period of time.
5. Refer to the packing list to ensure that you have received all components.
6. Retain all packing materials and shipping containers for future use. Store them in a clean, dry location.

If you do not plan to begin using the device immediately, return all components to their shipping containers and store them in a suitable location (*see "Storage" on page 11*).

Installing the Dopants and Calibrant

You must install the calibrant and dopants, as described in this section, as part of the procedure for preparing the device for operation (the calibrant and dopants are shipped separately from the device in order to comply with governmental and carrier requirements).

If you do not intend to install the dopants right away, you should immediately store them in the proper environment to extend their life (*see "Storing the Dopants " on page 11*). Do not remove the taped end caps from the shipping tubes until you are ready to install the dopants in the device. This ensures the maximum storage life of the dopants.



IMPORTANT Ensure that you install the dopants and calibrant in their correct chambers.



Whenever you install new dopant tubes, wait two hours before you attempt to use the device (this time is necessary for the dopants to diffuse into the device).

Installing the Negative Ion Dopant

To install the negative ion dopant:

1. Verify that power to the device is off.
2. Put on clean, powder-free gloves.
3. Clean the dopant tube with an alcohol wipe.
4. Push down on the latch of the rear panel door and swing it open.
5. Pull off the cap of the (-) **DOPANT** chamber (as you pull the cap off, turn it slightly from side to side to make it easier to remove).
6. Place the end cap on a clean surface.

7. Insert the negative ion dopant tube into the dopant chamber with the metal cap facing out.



8. Push the negative (-) **DOPANT** end cap back in place. As you push the cap back into place, turn it slightly from side to side to make it easier to replace. Ensure that the cap is fully and securely installed.
9. Close the rear panel door; ensure that it is securely latched.

This completes the procedure.

Installing the Positive Ion Dopant

To install the positive ion dopant:

1. Verify that power to the device is off.
2. Ensure that the dopant tube is at room temperature.
3. Put on clean, powder-free gloves (if you are not already wearing them).
4. Clean the dopant tube with an alcohol wipe.
5. Push down on the latch of the rear panel door and swing it open (if it is not already open).
6. Pull off the cap of the (+) **DOPANT** chamber (as you pull the cap off, turn it slightly from side to side to make it easier to remove).
7. Place the end cap on a clean surface.

8. Insert the positive ion dopant tube into the dopant chamber with the red or tan colored end facing out.



9. Push the positive (+) **DOPANT** end cap back in place. As you push the cap back into place, turn it slightly from side to side to make it easier to replace. Ensure that the cap is fully and securely installed.
10. Close the rear panel door; ensure that it is securely latched.

This completes the procedure.

Installing the Internal Calibrant

To install the internal calibrant:

1. Verify that power to the device is off.
2. Put on clean, powder-free gloves (if you are not already wearing them).
3. Clean the calibrant tube with an alcohol wipe.
4. Push down on the latch of the rear panel door and swing it open (if it is not already open).
5. Pull off the cap of the (C) **CALIBRANT** chamber. As you pull the cap off, turn it slightly from side to side to make it easier to remove.
6. Place the end cap on a clean surface.

7. Insert the internal calibrant tube into the *CALIBRANT* chamber with the metal cap facing out.



8. Push the calibrant end cap back in place. As you push the cap back into place, turn it slightly from side to side to make it easier to replace. Ensure that the cap is fully and securely installed.
9. Close the rear panel door; ensure that it is securely latched.

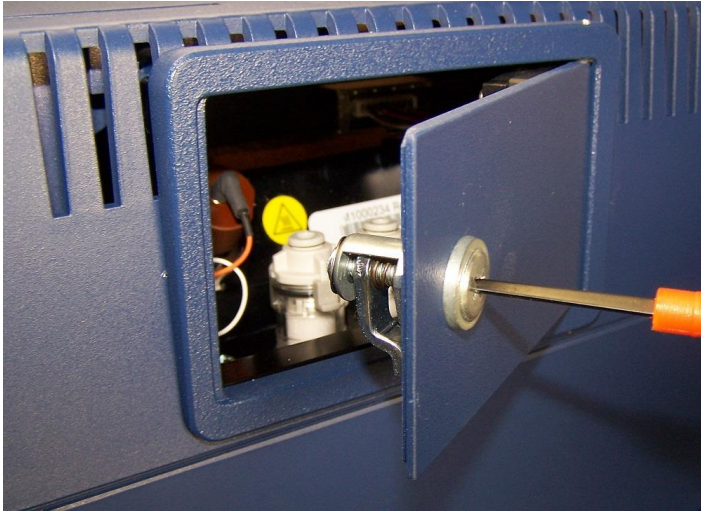
This completes the procedure.

Installing the Lamp

The next step is to install a lamp in the device (the device is shipped without the lamp installed).

To install a lamp:

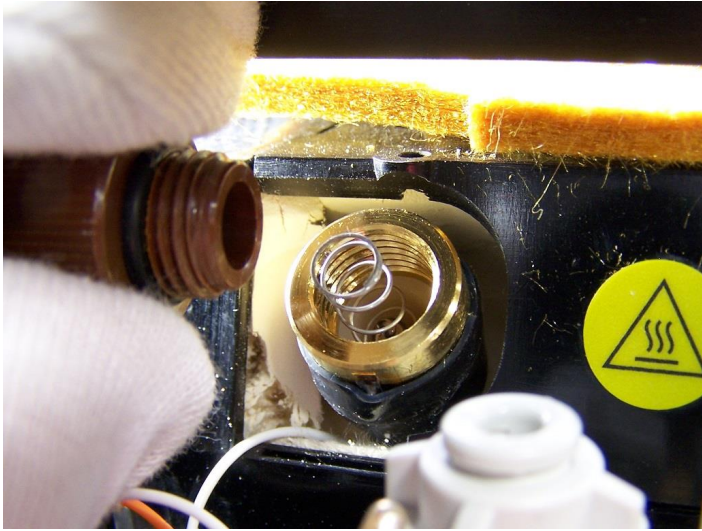
1. Verify that power to the device is off.
2. Use the end of the lamp removal tool to open the side panel door.



3. Put on a pair of clean, powder-free gloves.
4. Pull the lamp connector upward to unplug it from the lamp holder cap.



5. Unscrew the lamp holder cap.



6. Remove the lamp electrode-spring assembly.



7. Remove the lamp from its packaging.



CAUTION

Never handle the lamp with your bare hands—always wear clean, powder-free gloves. If you do not, you might damage the lamp or significantly reduce its life.



8. Clean the lamp with an alcohol wipe.
9. Install the lamp into the lamp chamber; put the blunt end of the lamp in first.



10. Install the lamp electrode-spring assembly into the lamp chamber; put the electrode (gold) end of the assembly in first.
11. Verify that you have inserted the lamp and lamp electrode/spring assembly in the correct orientation, and in the correct order.



12. Screw the lamp holder cap clockwise onto the lamp chamber until the O-ring bottoms out on the chamber.

**CAUTION**

Do not over-tighten the lamp holder cap. If you do so, you might damage the cap or the detector, and negatively affect the operation of the device.

13. Connect the lamp connector to the top of the lamp holder cap.



14. Close the side panel door and use the end of the lamp removal tool to latch the door (turn the tool 1/4 turn clockwise).

This completes the procedure.

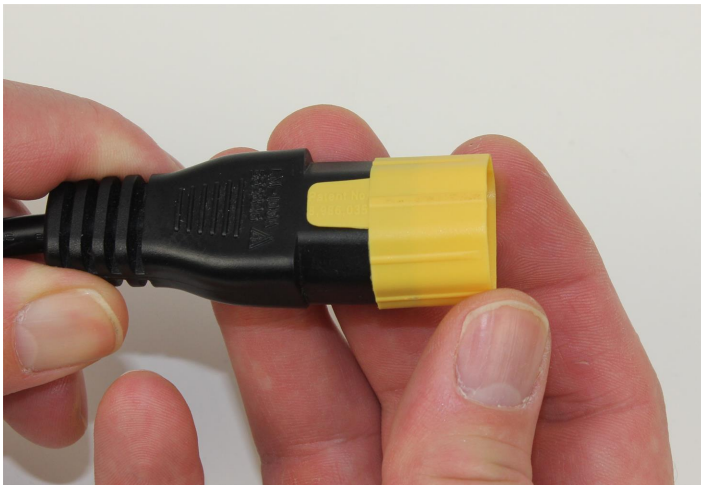
Powering On the Device

You can use either an electrical outlet or a vehicle to power the device.

Using an Electrical Outlet

To power on the device using an electrical outlet:

1. Plug the power adapter into the rear panel of the device:
 - a. Align the dots on the power adapter cord with the dots on the DC Power receptacle on the rear panel of the device (*see "Rear Panel" on page 1*).
 - b. Push the connector firmly into the receptacle until it is fully engaged.
2. Push the power cord plug lock over the input end of the power cord.



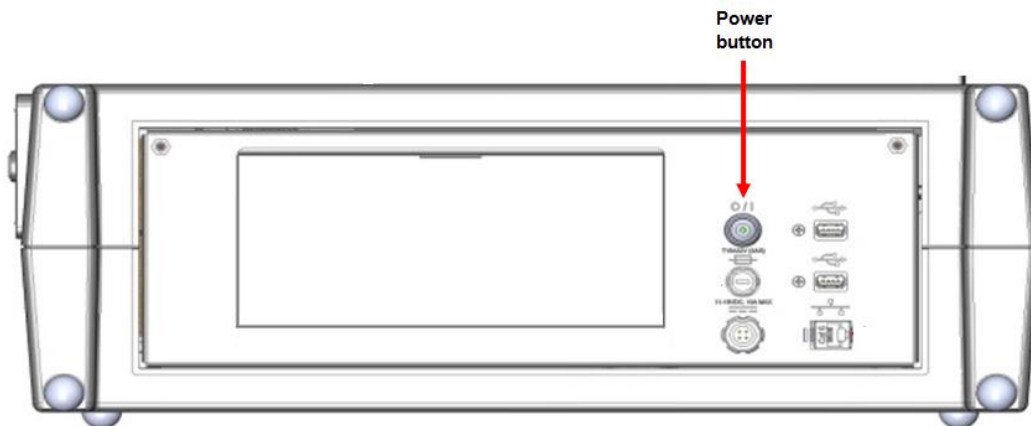
3. Ensure that the power cord plug lock is fully seated on the end of the cord.



4. Grip the power adapter firmly in one hand.
5. With your other hand, push the power cord into the socket on the power adapter (due to the snug fit, this requires considerable effort). Make sure that you push the cord in as far as it can go.



6. Plug the other end of the power cord into an AC electrical outlet supplying 90-264 VAC, 47-63 Hz.
7. Push the power button on the rear panel.



The green light on the power button is illuminated.
This completes the procedure.

Using the Vehicle Power Adapter

To power on the device using the vehicle power adapter:

1. Plug the vehicle power adapter cord into the rear panel of the device:
 - a. Align the dots on the vehicle power adapter cord with the dots on the DC Power receptacle on the rear panel of the device (*see "Rear Panel" on page 1*).
 - b. Push the connector firmly into the receptacle until it is fully engaged.
2. Ensure that the vehicle is running.
3. Plug the power supply cord into the vehicle's 12 VDC outlet.
4. Push the power button on the rear panel of the device.

The green light on the power button is illuminated.

This completes the procedure.

Logging On (Initial)

To perform the initial log-on procedure:

1. Type your user name in the **User Name** field.
2. Touch the **Password** entry box to highlight it.
3. Type your password.

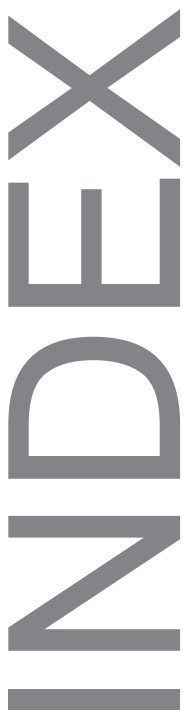
4. Press **Log On**:

The screen displays the *Stabilizing* warning, along with a 24-hour count-down, in the status bar while the device begins warming up to its operating temperature (see ["Warm-Up Time" on page 48](#)).

5. Wait for the device to display the *Calibration Warning* message.
6. Perform a manual calibration (see ["Manual Calibrate" on page 111](#)).
7. Set the default calibration factors (see ["Set Default Calibration Factors" on page 139](#)).
8. Perform an internal calibration (see ["Internal Calibrate" on page 107](#)).
9. Set the default calibration factors (see ["Set Default Calibration Factors" on page 139](#)).

This completes the procedure.

Note that if you are using the factory-installed passwords provided during the installation and training session you should change these as soon as possible to ensure the security of the device (see ["Modifying User Information" on page 168](#)).



3

3-D view [60](#)

A

Add Maintenance Log [98](#)

Adding Substances [147](#)

Adding Users [164](#)

Adjust Date & Time [162](#)

adjust date and time [62](#)

Advanced Menu [64](#), [161](#)

Alarm

resolution protocol [29](#)

sequence [30](#)

As-Needed Maintenance [208](#)

As-Needed Maintenance Log [232](#)

Audible Alarms and Warnings [50](#)

Auto Increment [123](#)

Auto Log Off [128](#)

Auto Print [122](#), [131](#)

Auto Purge after n days [129](#)

Auto Save [122](#)

Avoiding Contamination [22](#)

B

Battery

back-up [8](#)

Battery charge level [36](#)

Best Used By [8](#), [211](#)

C

Cal-ExtNeg [90](#)

Cal-ExtNegLong [114](#)

Cal-ExtNegShort [112](#)

Cal-ExtPos [90](#)

Cal-ExtPosShort [115](#), [117](#)

Calibrate

manual [108](#)

pumps and flows [162](#), [216](#),
[225](#)

purge flow [162](#)

temperatures [163](#)

touchscreen [163](#)

Calibrate Options Dialog [111](#)

Calibrate Pumps and Flows [67-](#)
[68](#), [75](#)

Calibrate Pumps/Flows [65](#)

- Calibrate Purge Flow [65, 81](#)
- Calibrate Sample Trap Sensor [65, 81, 162](#)
- Calibrate Temperatures [65, 82](#)
- calibrate the touchscreen [82](#)
- Calibrate Touchscreen [65](#)
- Calibration [189](#)
 - traps [211](#)
 - warning [176](#)
- Calibration trap [6](#)
- Cancel [65, 84, 161](#)
- Canless Air [196, 198](#)
- Cautions [10](#)
- Change Language [65, 84, 163](#)
- Change Mode [161](#)
- Change Password [168](#)
- Clear [35-37, 90, 119, 135, 160](#)
 - alarm [29, 37](#)
 - options [39](#)
- Clearing a Trap [39](#)
- Clearing an Alarm [29, 37](#)
- Command Prompt [163](#)
- Config/Notes [86, 161](#)
- Configuration [161](#)
- Configuration version [36](#)
- Consumables
 - ordering [235](#)
- Copy Data [61](#)
- Copy Live [61](#)
- Copy Raw [61](#)
- Count warning [123](#)

- Customer
 - service [5](#)
- Customer Service [235](#)

D

- Data [36, 40, 56](#)
- Data Files [129](#)
- Data Logs [129](#)
- Date & time
 - adjust [65](#)
- Date and tim [36](#)
- Date/Time Format [125](#)
- Dealer [227](#)
- Dealer Contact Information [227](#)
- Debug Logs [129](#)
- Delete Alarm Files [163](#)
- Deleting Substance [154](#)
- Deleting User Records [170](#)
- Desorber [180](#)
 - clean [198-199](#)
 - heater [180](#)
 - remove [192](#)
 - seated [180](#)
- desorber slot [3](#)
- Detection mode [36](#)
- Detection Mode
 - substances [86](#)
- Detector
 - heater [180](#)
 - purge inlet filter [223](#)

- Detector Flow
 - warning [177](#)
- Device
 - powering up [16, 248](#)
 - receiving [239](#)
 - shipping [13](#)
 - shipping case [239](#)
 - specifications [8](#)
 - storage [11-12](#)
- Diagnostics and Logging [87](#)
- Dimensions [8](#)
- Disable Shutdown from Logon
 - screen [128](#)
- Disable Super User Access [128](#)
- Display [124](#)
- Display Alarm Strength [121](#)
- Display Options [121, 124](#)
- Display User Level [123](#)
- Documentation
 - related [13](#)
- Don't allow old passwords [127](#)
- Dopant
 - chamber end cap [205-206](#)
 - fitting [75](#)
 - installing [240-241](#)
 - negative ion [205](#)
 - positive ion [11, 204](#)
 - replace [204-206](#)
 - shelf life [11](#)
 - shipping [240](#)
 - storage conditions [11](#)
 - temperature [180](#)
- Dopant Heater off During Heat/Clean Stage [123](#)
- Dopants [211](#)
 - replacement [231](#)
- Dryer
 - purge inlet filter [223](#)

E

- Enable [128](#)
- Enable Logging [87](#)
- Enabled [123](#)
- Environmental [8](#)
- Ethernet [8](#)
- Event Logs [129](#)
- Exit ITMS [89, 161](#)
- Export History/Data [101](#)
- External Calibrate [89, 161](#)
- External Components [3](#)
- External VGA
 - monitor port [8](#)

F

- factory-installed passwords [251](#)
- Filters
 - detector [223](#)
 - dryer [223](#)
- Flow meter [75](#)
- FPGA Diagnostics [65, 91, 163](#)
- Front panel [3](#)

Front Panel
touchscreen [3](#)

H

handle [4](#)
Heater/Power [93](#)
Help [35-36](#), [41](#), [160](#)
High Voltage [92](#)
History [47](#)

- data [101](#)
- display events [98](#)
- events [97-98](#)
- export [101](#)
- from and through [97](#)
- print [100](#)
- purge [105](#)
- selected event [97](#)
- statistics [97-98](#), [100](#)

History Data Export [97](#), [161](#), [174](#)
History Purging (Nightly) [129](#)
Hot Swap [217](#)

I

Import User Database [65](#), [163](#)
Initial Setup [238](#)
Insert Clean Trap [119](#)
Install the Lamp [244](#)
Intensity map view [58](#)
interface O-ring [194](#)
Internal Cal Trigger [161](#)

Internal Calibrant [12](#), [240](#)

- installing [242](#)

Internal Calibrate [107](#), [161](#)
Internal Calibration [216](#), [225](#)
Internal Calibration Check [108](#)
Internal disk drive [8](#)
Ion trap mobility spectrometry [2](#)
IP [142](#)
ITMS [2](#), [6](#), [89](#)

L

Label [125](#)
Lamp [9](#), [106](#), [181](#), [211](#)

- chamber [215](#), [220-221](#), [246-247](#)
- connector [212](#), [218](#), [244](#)
- holder cap [213](#), [218](#), [245](#)
- removal tool [212](#), [217](#), [244](#)
- replace [211](#)
- spring assembly [213](#), [219](#), [245](#)
- warning [182](#)

Lamp Diagnostics [106](#)
Lamp indicator [36](#)
Lamp lifetime [9](#)
Lamp Operating Life [9](#)
Last sample time [36](#)
List View [54](#), [90](#)
Live mode [109](#)
Live Mode [161](#)
Lock account after n failed logons [128](#)
Lock timeout [128](#)
Log after sample [87](#)

Log Maintenance [110](#)
Log Off [35-36](#), [43](#), [160](#)
Log off after n minutes of activity [128](#)
Log On [20](#), [46](#), [250](#)
 failed [47](#)

M

main window [35](#)
Main Window Functions [35](#)
Maintenance [189](#), [226](#)
 as-needed [208](#)
 monthly [190](#)
 six month [203](#)
 six month log [231](#)
Maintenance Log [189](#), [202](#), [208](#), [229](#)
 add [98](#), [110](#)
 monthly [230](#)
Maintenance Reminders [226](#)
Manual Calibrate [111](#), [162](#)
Max maint level users [128](#)
Maximum Age [128](#)
Maximum length [127](#)
Maximum Length [128](#)
Measuring [74](#), [80](#)
Menu [33](#), [35-36](#), [49](#), [161](#)
 advanced menu [64](#)
 functions [62](#)
 live mode [109](#)
Mesh screen [195](#)
mesh screen tool [195](#)
Minimum Age [128](#)

Minimum Length [127-128](#)
Minimum lower case characters [128](#)
Minimum numeric characters [128](#)
Minimum special characters [128](#)
Minimum upper case character [128](#)
Modifying Substances [153](#)
Modifying User Information [168](#)
Monthly Maintenance [190](#)

N

Nightly Energy Save/Thermal Clean [123](#)
Nightly Maintenance [123](#)
Nightly Trap Sensor Calibration [123](#)
No-Alarm Sequence [31](#)
Nozzle
 remove [192](#)
Nozzle ring nut
 remove [192](#)

O

O-ring
 inspection [205-206](#)
on-line help [41](#)
Open Alarms Folder [163](#)
Open Internal Cal Valves [87](#)
Operating environment [8](#)
Options [29](#), [37](#), [120](#), [162](#)
 peaks found list [131](#)

P

- Pan [61](#)
- Password [46](#), [250](#)
- Password Age [127](#)
- Password Complexity [128](#)
- Password history size [127](#)
- Password/Security Policy [65](#), [126](#), [163](#)
- Peaks found list [36](#), [56](#)
- Peaks Found List [57](#), [125](#)
- Plasmagram [36](#)
 - height [58](#)
- Plasmagram view [121](#)
 - height [56](#)
 - time [56](#)
- Please Enter Notes [138](#)
- Please Remove Sample [26](#)
- Power Requirements [9](#)
- Power Up [16](#), [248](#)
- preparing the location [238](#)
- Previous Zoom [61](#)
- Print [130](#), [162](#)
 - config [131](#)
 - data [3](#), [131](#)
 - data and config [131](#)
 - page feed [131](#)
 - show print options [131](#)
 - show print queue [131](#)
 - statistics [100](#)
- printer [3](#)
- Printer [8](#)

Printer paper

- install [208](#)

Processed Data [124](#)

Processed Plasmagram [124](#)

Protection rating [8](#)

Purge History [105](#)

Q

Quad Peak Calibrate [112](#)

R

Random Search Generator [131](#), [162](#)

- activate [132-133](#)

Raw Plasmagram [124](#)

Rear panel [3-4](#)

- backup battery [5](#)

- DC power [4](#)

- dopant chamber [5](#)

- fuses [5](#)

- network/ethernet [5](#)

- power button [5](#)

- USB port [5](#)

Reboot [89](#)

Recall [134](#), [162](#)

- select file [134](#)

Regenerative Dryer [178](#)

Reminders [125](#)

Remote Connect [65](#)

Remote Connect Console [13](#)

Remote Connect Console User's
Guide [135](#)

Remote Connect Settings [135, 163](#)

Replace

 printer paper [208](#)

Replace the Mesh Screen [195](#)

Report Level [121](#)

Requirements

 hardware [5](#)

Reset Zoom [61](#)

Restore All Default Settings [65, 136](#)

Restore All Default Settings and Delete
 All Alarm Files [163](#)

Restore default config [66](#)

Restore Default Config [136, 163](#)

Restoring Default Users [170](#)

Run Application [163](#)

S

Safely Remove USB Hardware [138, 162](#)

Sample

 collection with wand [27](#)

Sample Flow In

 Flow/Pump On [73, 79](#)

Sample trap [6](#)

Sample Trap Counter [123](#)

Sampling [24](#)

 event [8](#)

 methods [131](#)

 sequence [30](#)

Sampling by Hand [25](#)

Save [138, 162](#)

 alarm [138](#)

Screen Saver [121](#)

Select [61](#)

Service

 customer [5](#)

Session Log [3](#)

Set Default [125](#)

Set Default Cal Factors [163](#)

Set Default Calibration Factors [66, 139](#)

Set Defaults [122-123, 128-129](#)

Set Device Name and Location [140](#)

Set Device Name/Location [162](#)

Set Lamp Intensity [163](#)

Set user privileges [66](#)

Set User Privileges [141, 163](#)

Shelf life [235](#)

Shipping

 damage [239](#)

Show network name and IP [66](#)

Show Network Name and IP [142, 163](#)

Show Substance Code [121](#)

Show Substances [61](#)

Shutdown [89](#)

Shutdown button [44](#)

Shutting Down the Device [44](#)

side panel [244](#)

Side panel [3-4](#)

Single-Peak Calibration [120](#)

Software [6](#)

 upgrade [157](#)

Software Upgrade Kit CD [157](#)

Sound [125](#)

- Sound indicator [36](#)
- Stabilizing Timer [251](#)
- Start ITMS [89](#)
- Start Time [123](#)
- Start Up Options [163](#)
- Statistics [143](#)
- Status [145](#), [162](#)
- Status bar [36](#)
- Status Bar [36](#)
- Storage environment [8](#)
- Strength [57](#)
- Substances [121](#), [146](#), [162](#)
 - add [147](#)
 - delete [154](#)
 - modify [153](#)
 - show [161](#)
- Substances Detected [57](#)

T

- Technical support [234](#)
- Thermal clean [154](#)
- Thermal Clean [162](#)
- thermal printer [3](#)
- Time [57](#)
- Toggle Lamp [41](#), [156](#), [162](#)
- touchscreen [3](#), [82](#)
- Transducer [95](#)
- Trap counter [37](#)
- Trap Counter [52](#)
- Traps [21](#)
 - calibration [6](#)

- insert clean [91](#)
 - sample [6](#), [211](#)
 - verification [6](#)
- Trigger [35](#), [37](#), [52](#), [87](#), [161](#)

U

- Unpacking the Components [239](#)
- Upgrade software [66](#)
- Upgrade Software [157](#), [163](#)
- USB port
 - keyboard [5](#)
- USB ports [8](#)
- User Log On [46](#)
- User Name [128](#)
- User name and ID [37](#)
- Users [159](#), [162](#)
 - adding [164](#)
 - deleting [170](#)
 - modifying [168](#)
 - privileges [141](#), [159-160](#)

V

- Verification
 - traps [211](#)
- verification trap [6](#)
- Verify [162](#), [171](#)
- View [37](#), [53](#), [160](#)
- View and Copy Options [61](#)
- View modes
 - 3-D [60](#)

intensity map [58](#)

List [54](#)

plasmagram [109](#), [121](#), [131](#)

Z

Zoom [61](#)

W

Warm Up

time [48](#)

Warning

battery low [175](#)

calibration [176](#)

Warnings [10](#), [174](#)

battery charger [10](#)

calibration [108](#)

detector flow [65](#), [177](#)

dryer [178](#)

hardware error [179](#)

heater [180](#)

lamp [182](#)

sample flow [65](#), [184](#)

stabilizing temperature [180](#), [185](#)

Warranty [235](#)

Write lamp DAC Before Logging [87](#)

X

X-Axis Display Units [121](#)

Y

Y-Axis Log Scale [121](#)

