

VexCal AV03

User manual



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Rights

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Total or partial reproduction and distribution of this documentation in any form or by any means without written permission of VECCSA S.A. is prohibited.

Warranty

If this product fails due to a defect in production materials or in manufacturing within the period of one (1) year after the purchase date, VECCSA S.A. will repair or replace the unit, as they see fit, free of charge. This warranty extends only to the original buyer and is non-transferable. This warranty does not cover the following: (a) damage to the units caused by accident, fall or incorrect manipulation, negligent use; (b) units that have been repaired by unauthorized personnel, opened, dismantled or modified in any other way; (c) units that have not been used according to the instructions; (d) damages that exceed the cost of the product; (e) the finish in any part of the product, such as the surface or protective coating, since this is considered normal use and wear; (f) damages produced during transportation, initial installation costs, uninstalling or reinstalling costs, transportation costs.

Technical Service

If repair is needed, we recommend you send the system to the manufacturer or an official distributor in order to maintain the quality and the safety of the product. See the [Service policy](#) section for more details.

User responsibility

The VexCal AV03 system is designed for use by qualified personnel only. It is designed to be used with radioactive material. Use safe and appropriate techniques to manipulate the material.

The VexCal AV03 system is a measuring device, the company does not assume responsibility for the treatment given to a patient based on the results provided by the system.

Calibration

The system must be calibrated following the regulations of the country in which it is used.

Software version

1.7.2.0

User manual version

Revision A – Julio 2018

Intended use

The VexCal AV-03 product is a system designed for measuring radionuclide activity. The measuring system consists of a cylindrical well-type ionization chamber. Its intended use is the verification of the activity of radiopharmaceuticals used in nuclear medicine. The activity value can be visualized on a tablet and shown in Bq (becquerel) or Ci (curie) units. The radioisotope to be measured can be selected on the screen in order to apply the corresponding correction factor. The use of the system and the interpretation of the data obtained with it should only be done by suitable nuclear medicine personnel.

Introduction

Welcome to the VexCal AV03 system for advanced measuring of nuclide activity. The VexCal AV03 system measures in a continuous manner the activity level of the well, and only requires the selection of the desired isotope.



Figure 1. VexCal AV03 System

The systems includes:

- Ionization chamber
- Sample holder
- 10.1"-screen tablet with Android operating system.
- Tablet stand
- USB cable
- 12V 2A power supply

About functioning and performance

The VexCal AV03 system allows to measure the activity level of a sample of a given nuclide.

The activity level is measured through a well-type ionization chamber, in a continuous manner.

A measure of the activity level is obtained every second and indicated in grey; after a stabilization process the activity level stabilized within 1% tolerance is indicated in white.

The quality of the measurement might be affected if the installation instructions given in the [Installation](#) section are not carefully followed.

Service policy

Veccsa has to carry out or approve all repairs of warranted products. Unauthorized repairs render the warranty void. Moreover, all repairs must be done exclusively by certified personnel of the Veccsa technical assistance service, whether they are within the warranty period or not.

If the product is not working properly, or if spare pieces or technical assistance are needed, contact Veccsa's closest technical assistance center. You will find the phone numbers in the [Contact](#) section.

Before contacting Veccsa, try to reproduce the problem and check all the accessories to make sure that they are not causing the problem. When contacting Veccsa, please have the following information ready:

Product name, model number and full description of the problem.

Serial number of the product (if applicable).

Name, address and phone number of your center.

In the case of out-of-warranty repairs or request of spare pieces, the invoice number and date (or credit card number).

To request spare pieces, the number(s) of the spare piece(s) you need.

If the product requires repair service that is covered by the warranty, with warranty extension or out-of-warranty, call Veccsa's closest technical assistance center first. A representative will help you identify the problem and try to solve it over the phone in order to avoid unnecessary returns.

If you need to return items for their repair, follow these packaging recommendations:

Remove all cables, sensors and accessory products (as needed) before proceeding to the packaging, unless you suspect they are related to the problem.

If possible, always use the original box or packaging materials.

It is recommended to insure all returned articles. Claims for loss or damages to the product must be presented to the sender.

Symbols



Warnings or precautions associated to the product. Read carefully.



Attention: see the instructions for use



Class II device



Direct Current



Temperature range (see the [Technical Specifications](#) section)



Keep dry (see the [Technical Specifications](#) section)



This side up.



Fragile, glass



Serial number



Keep away from direct sunlight.



Manufacturer information:

VECCSA S.A.

Juramento 5841 (C1431CLA) Buenos Aires – Argentina

Technical Director: Daniel Taboh P. Eng. MN5224

Contact

Address: Juramento 5841 - (C1431CLA) Buenos Aires, Argentina

Phone number: (5411) 4572-7004 / 4572-0045 (fax)

E-mail: info@veccsa.com

Website: www.veccsa.com

Distributor in Brazil:

LK Technology Comércio e Serviços Ltda.

Address: Av. Brigadeiro Faria Lima, 1234 Conj. 123
Jd. Paulistano – São Paulo – SP

CEP: 01451-001

Phone number: (11) 3095-9222

E-mail: faleconosco@lktechnology.com.br

Website: www.lktechnology.com.br

Safe use of the device

Warnings

Warnings in this manual identify situations or practices that, if not immediately corrected or abandoned, might produce injuries, illnesses or even the death of the patient.



WARNING Do NOT use the system without calibrating it nor with an expired calibration.

WARNING It is recommended to follow the technical documentation of the IAEA 602: “Quality control of nuclear medicine instruments 1991”.

WARNING Do NOT use acetone, ether, freon, petrol derivates or other solvents to clean the system.

WARNING Do NOT immerse the VexCal dose calibrator in any liquid or drop liquids on it. Do not clean it with liquid detergents or other cleaning products. If any of this happens, send the unit to an authorized Veccsa service center. The VexCal dose calibrator should only be cleaned with a wet cloth.

WARNING Do NOT dismantle or modify the system in any way.

WARNING Do NOT repair the unit yourself. Repairs are to be done by authorized personnel from Veccsa service centers only.

Installation

About the installation location:

- It must be placed where the background activity level is as low and constant as possible.
- The surface must be always dry.
- The surface must resist 15kg
- The surface must be firm and have no vibration.
- The distance between the system and the wall must be of at least 5cm.
- The outlet must be no more than 1m away from the system and be accessible to the operator.

System Configuration

The tablet has the software preinstalled.

Hardware Configuration

Connect the ionization chamber to the power supply with the supplied charger (12V 2A) and connect the chamber to the supplied tablet with the USB cable. Turn on the ionization chamber with the Start/On switch. The AV-03 application will start automatically. The chamber needs at least 5 minutes to stabilize. During this time the application will indicate “Warming up chamber”:

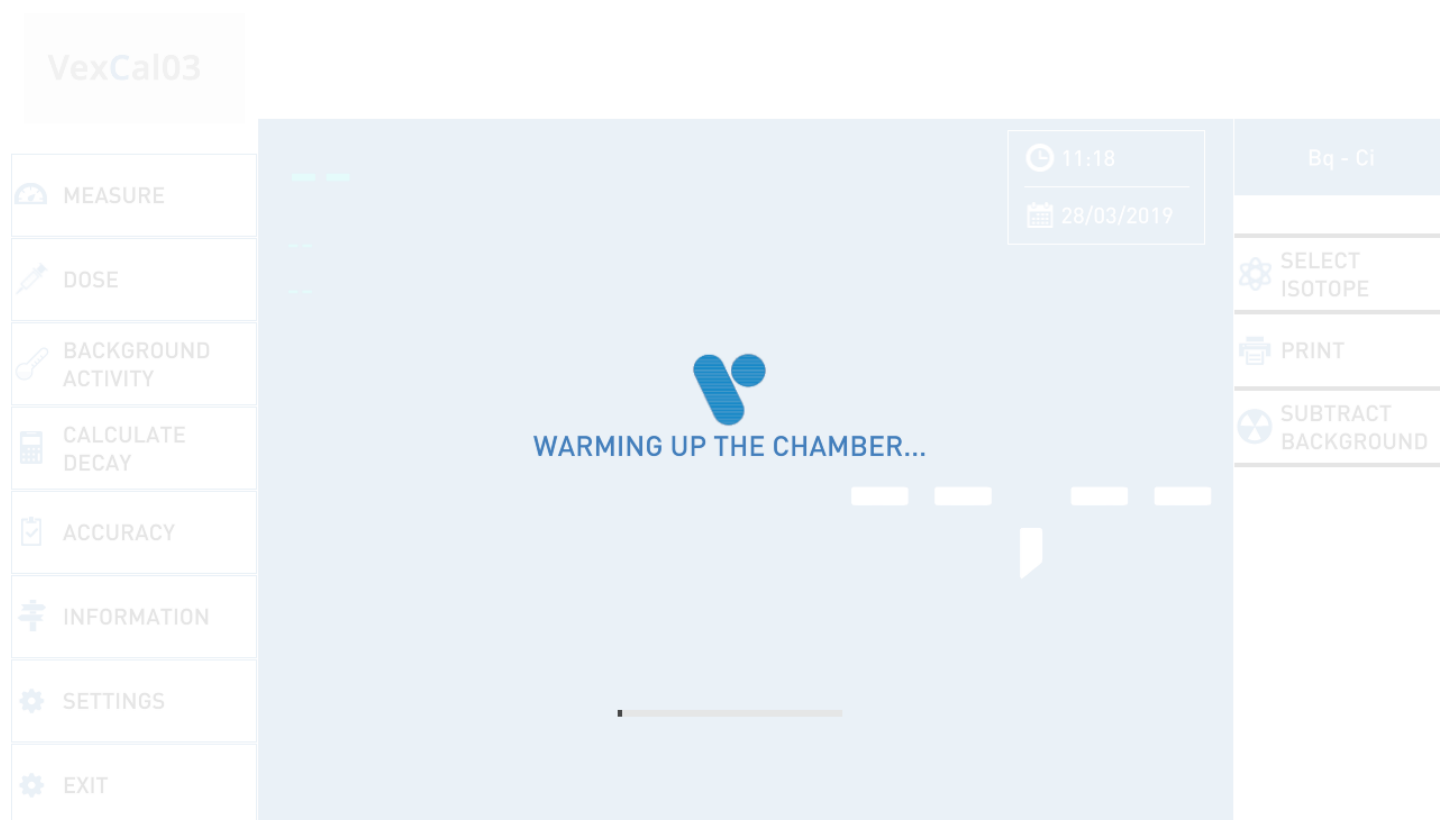


Figure 2. Warming up chamber

After this time, it is desirable to wait 25 minutes before taking measurements of small activities.

Software Configuration

After starting the system for the first time, it has to be configured for best performance, as explained in the [Configuration](#) section. To allow for a better performance, the frequency of the power network of your country and the preferred language for the interface have to be configured.

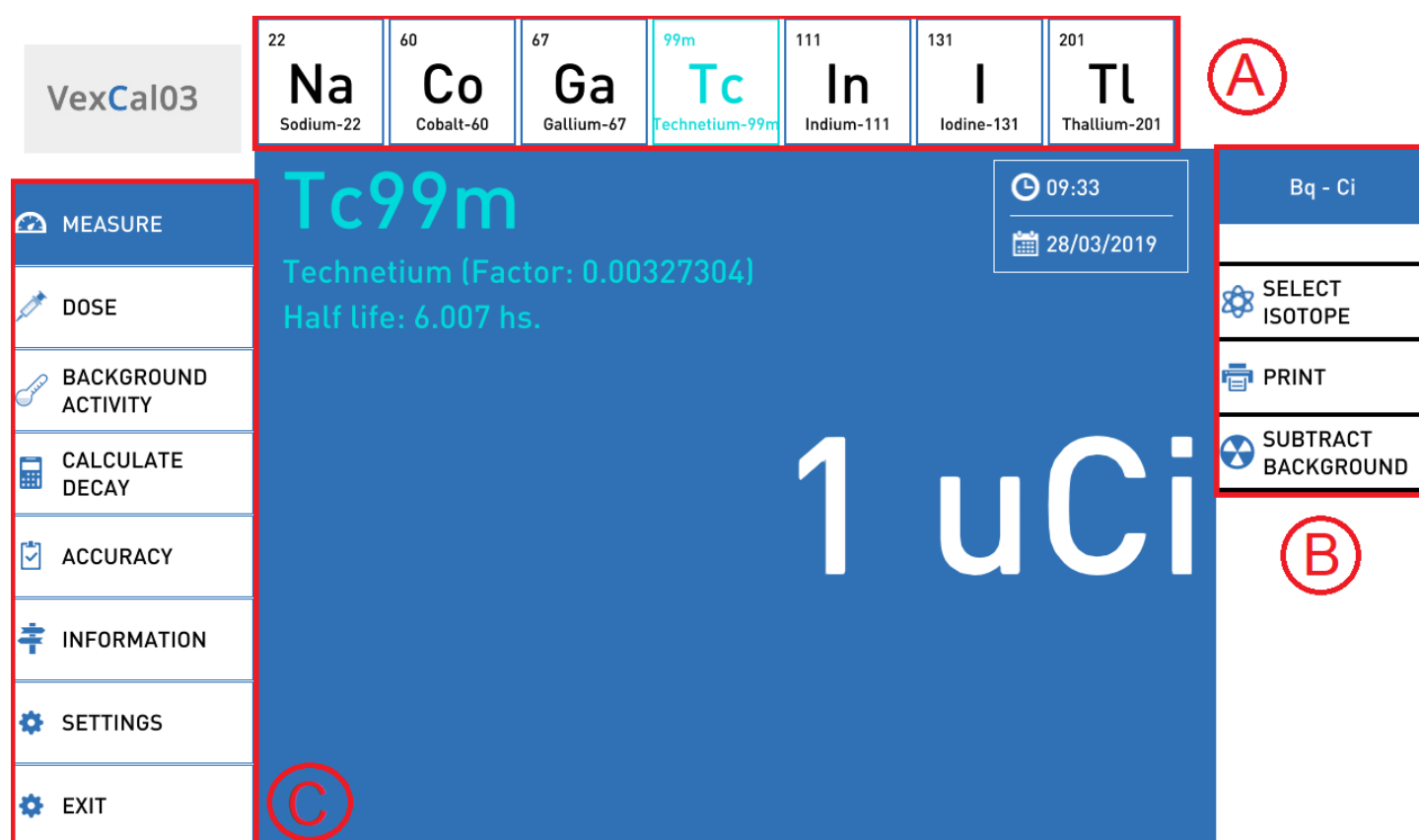
Operating the software

All the screens and their use are described as follows.

Accuracy

On each screen that shows a measurement of the dose calibrator, the measurement can appear in grey or white. Grey indicated a non-stabilized measurement, that is, that the measurement still has an error higher than 1%. White indicates a stabilized measurement with an error lower than 1%.

Main Screen



The screenshot shows the VexCal03 interface. At the top, an isotope bar (A) contains buttons for Na (Sodium-22), Co (Cobalt-60), Ga (Gallium-67), Tc (Technetium-99m), In (Indium-111), I (Iodine-131), and Tl (Thallium-201). The Tc button is highlighted. Below the bar, the main display (B) shows 'Tc99m' in large blue text, followed by 'Technetium (Factor: 0.00327304)' and 'Half life: 6.007 hs.'. A large white '1 uCi' measurement is displayed in the center. The top right shows a clock at 09:33 and a date of 28/03/2019. On the left, a main menu (C) lists: MEASURE, DOSE, BACKGROUND ACTIVITY, CALCULATE DECAY, ACCURACY, INFORMATION, SETTINGS, and EXIT. On the right, a panel shows 'Bq - Ci' and three options: SELECT ISOTOPE, PRINT, and SUBTRACT BACKGROUND.

Figure 3. Measuring

The main screen has:

A. Isotope bar: Calibrated isotopes ordered by frequency of use.

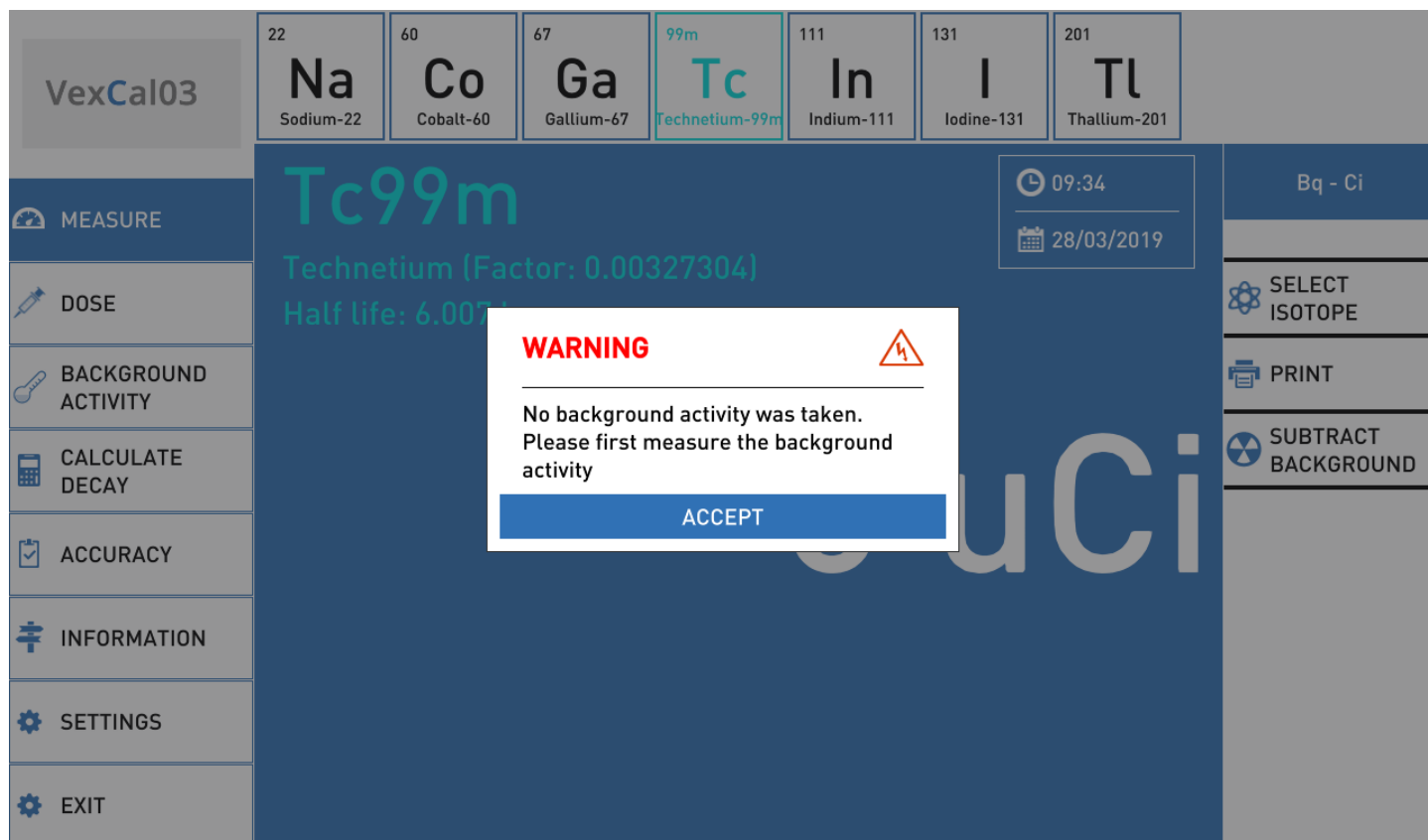
B. Screen options: Options applicable to the current screen.

C. Main menu: From this menu you can navigate between the different screens of the dose calibrator.


Measuring Screen

This screen shows the measurements of the dose calibrator in a continuous manner. The options of the current screen include:

- **Bq-Ci:** Selection of a unit to show measurements.
- **Select isotope:** Selection of calibrated isotopes in a list ordered by frequency of use, in descending order.
- **Print:** Prints the current measurement (printer is optional).
- **Subtract background:** It subtracts the measured background. If there is no previously saved background, the need to measure background activity will be indicated, and then it will be possible to subtract it.



The screenshot shows the VexCal03 interface. At the top, there are buttons for isotopes: Na (Sodium-22), Co (Cobalt-60), Ga (Gallium-67), Tc (Technetium-99m), In (Indium-111), I (Iodine-131), and Tl (Thallium-201). The Tc button is selected. Below the isotope buttons, the screen displays 'Tc99m' and 'Technetium (Factor: 0.00327304)'. A warning dialog box is overlaid on the screen, containing the following text:

WARNING 

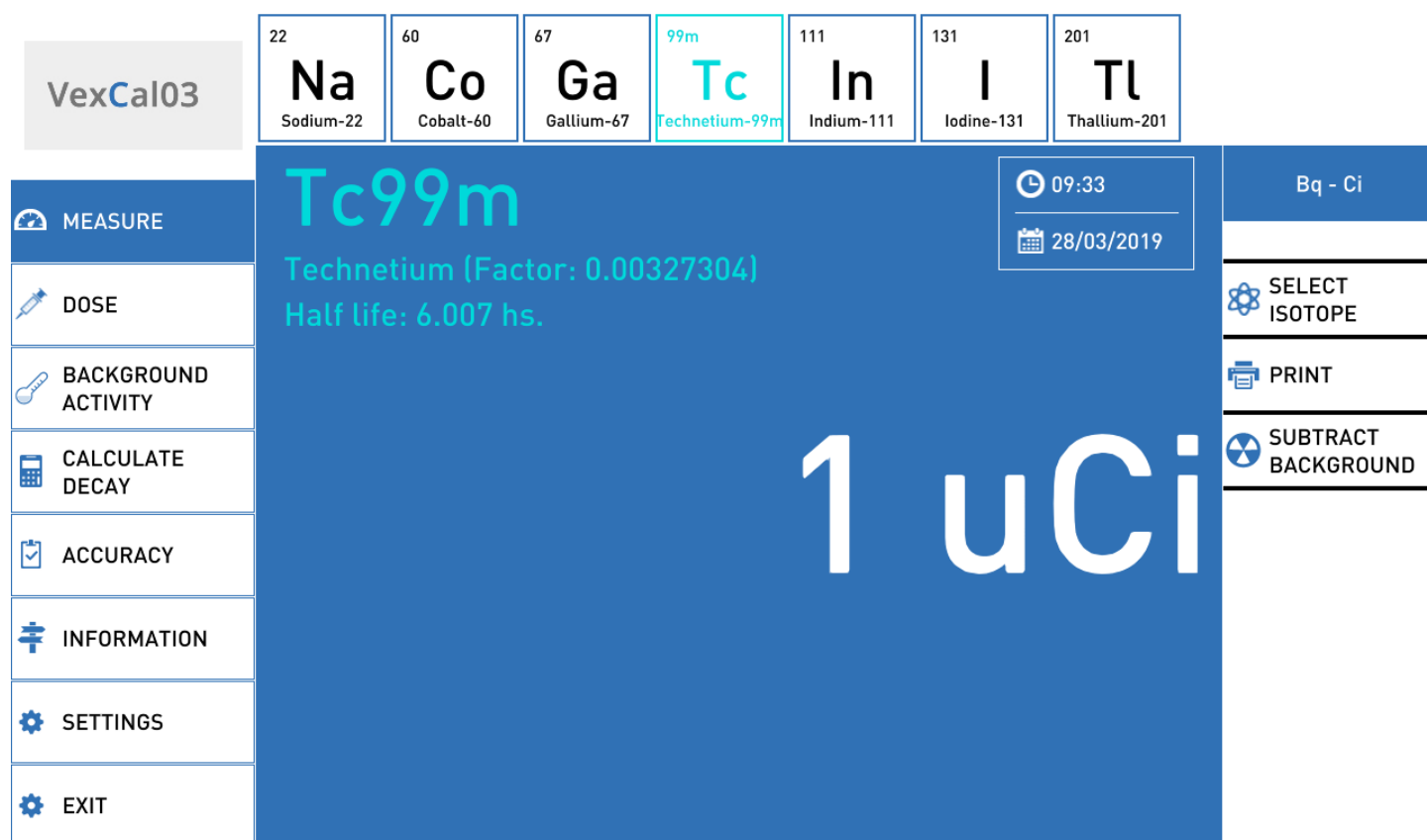
No background activity was taken.
Please first measure the background activity

ACCEPT

On the right side of the screen, there are buttons for 'Bq - Ci', 'SELECT ISOTOPE', 'PRINT', and 'SUBTRACT BACKGROUND'. The 'SUBTRACT BACKGROUND' button is highlighted. The left side of the screen has a menu with options: MEASURE, DOSE, BACKGROUND ACTIVITY, CALCULATE DECAY, ACCURACY, INFORMATION, SETTINGS, and EXIT.

Figure 4. Subtract background activity

Once the background measurement is taken, you can press the Subtract background button; you will see its status (Enabled/Disabled) and background value on the right bottom area of the screen.



The screenshot shows the VexCal03 application interface. At the top, there is a row of isotope selection buttons: Na (Sodium-22), Co (Cobalt-60), Ga (Gallium-67), Tc (Technetium-99m), In (Indium-111), I (Iodine-131), and Tl (Thallium-201). The Tc button is highlighted in cyan. Below this is a large blue panel displaying 'Tc99m' in large cyan text, followed by 'Technetium (Factor: 0.00327304)' and 'Half life: 6.007 hs.' in smaller cyan text. In the center of this panel, '1 uCi' is displayed in large white text. To the right of the panel, there is a small box showing the time '09:33' and the date '28/03/2019'. On the far right, there is a vertical menu with buttons: 'Bq - Ci', 'SELECT ISOTOPE', 'PRINT', and 'SUBTRACT BACKGROUND'. The 'SUBTRACT BACKGROUND' button is highlighted with a white border and a radiation symbol icon. On the left side, there is a vertical menu with buttons: 'MEASURE', 'DOSE', 'BACKGROUND ACTIVITY', 'CALCULATE DECAY', 'ACCURACY', 'INFORMATION', 'SETTINGS', and 'EXIT'. The 'BACKGROUND ACTIVITY' button is highlighted with a white border.

Figure 5. Subtracting background activity

The background value is automatically recalculated according to the isotope you choose to measure.

Dose Calculation

This screen will calculate the future dose for the current sample. The user will have to enter a future date and the program will calculate the isotope activity for that date, applying the decay factor to the current activity.

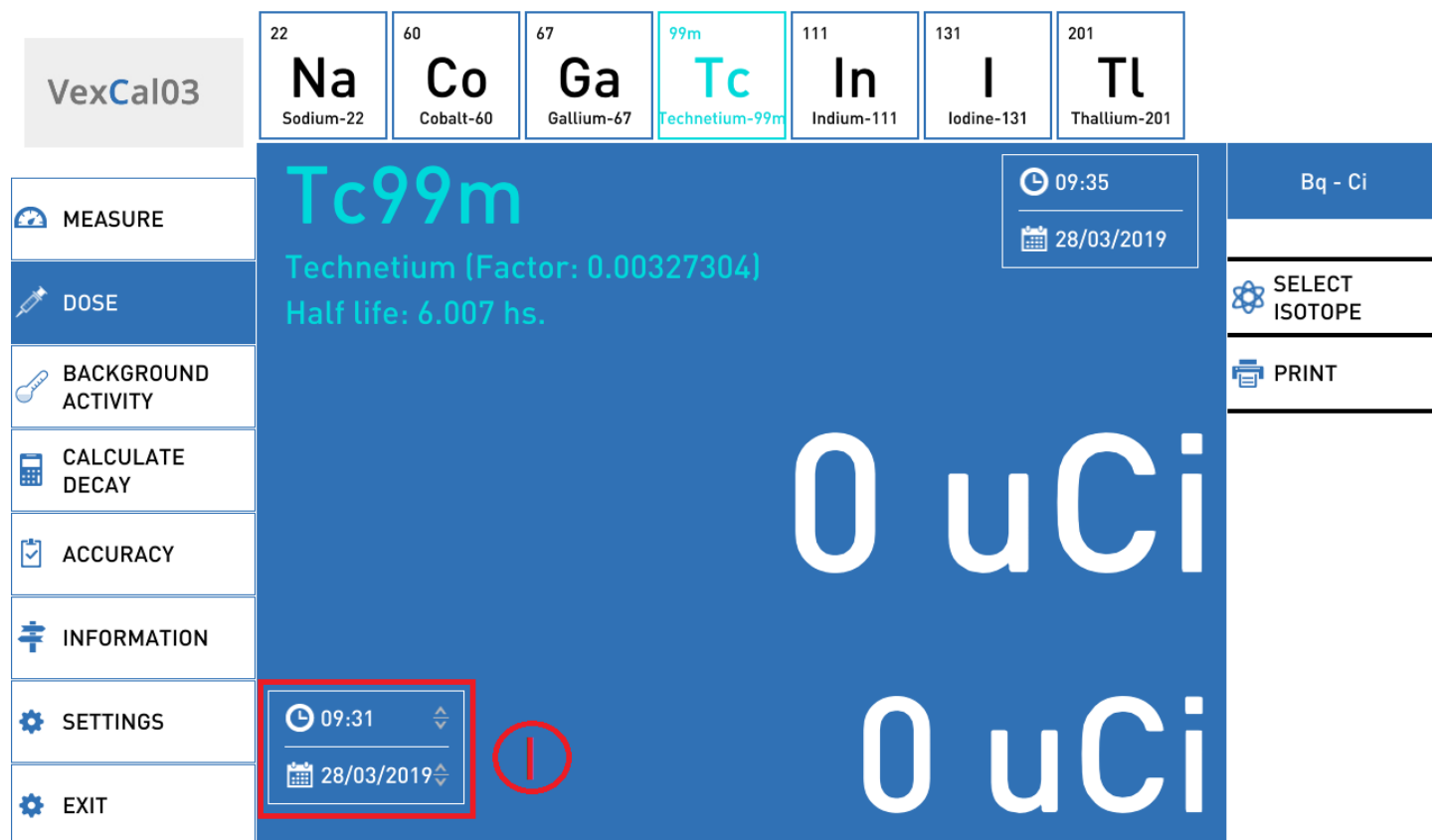


Figure 6. Dose

The date and the time for the future dose calculation is selected with the I buttons.

Background Activity Calculation

This screen allows to measure and save the system's background activity value. When you access this screen, you will be indicated to extract all the samples from the dose calibrator and its surroundings. Once the background activity has been measured, the range in which it is included will be indicated:

Tabla 1. Values for background activity

Acceptable	High but acceptable	Too high, unacceptable
< 10uCi	Between 10uCi and 530uCi	> 530uCi

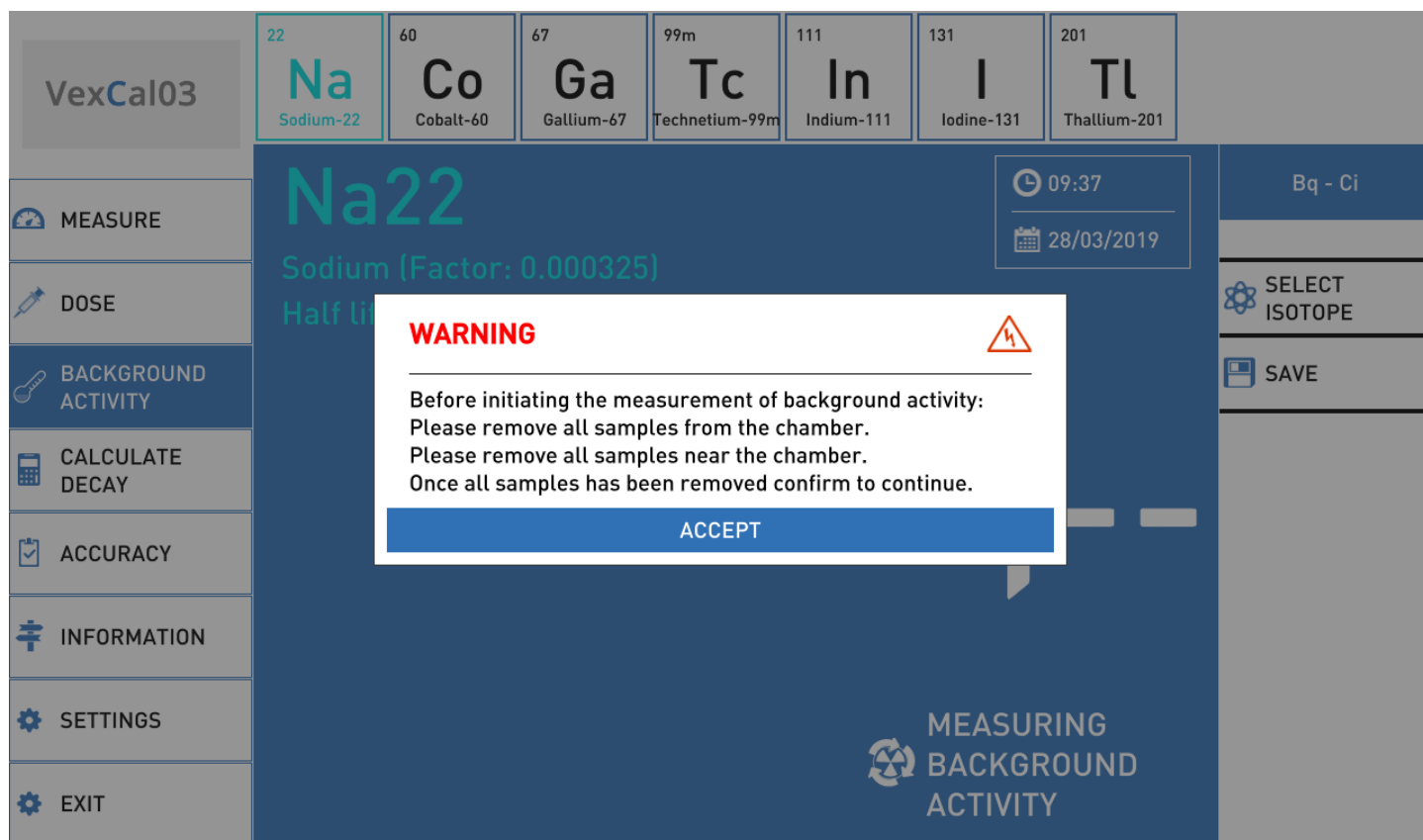


Figure 7. Background activity

Once the background measurement is complete, you can save the value for a future subtraction with the **SAVE** button.

Decay Calculation

This screen calculates the decay for the selected isotope. It allows to calculate the activity for a sample on a future date. There are two ways to use this, described below.

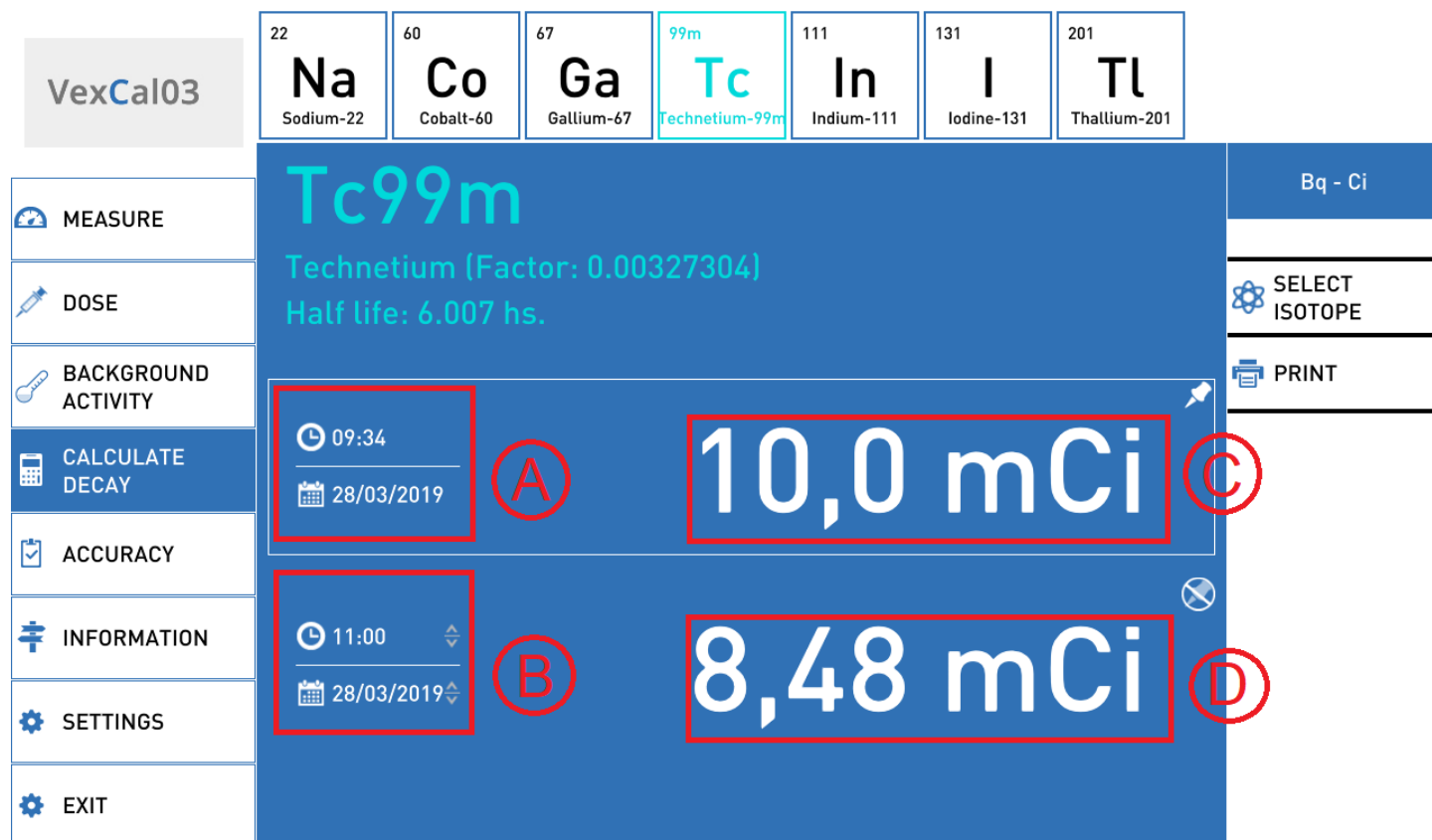


Figure 8. Calculate decay

A: Current time and date (it is always the current time, it cannot be modified by the user).

B: Selected time and date.

C: Activity corresponding to time A.

D: Activity corresponding to time B.

It works in two different ways:

Mode I: the user sets the time and date (**B**) and the value of the current activity (**C**), the application calculates the activity value of the selected isotope for the selected time and date (**D**).

Mode II: the user sets the time and date (**B**) and the activity value for that date (**D**), the application calculated the activity value of the selected isotope for the current time and date (**C**).

VexCal03

22 Na <small>Sodium-22</small>	60 Co <small>Cobalt-60</small>	67 Ga <small>Gallium-67</small>	99m Tc <small>Technetium-99m</small>	111 In <small>Indium-111</small>	131 I <small>Iodine-131</small>	201 Tl <small>Thallium-201</small>
---	---	--	---	---	--	---

- MEASURE
- DOSE
- BACKGROUND ACTIVITY
- CALCULATE DECAY
- ACCURACY
- INFORMATION
- SETTINGS
- EXIT

Tc99m

Technetium (Factor: 0.00327304)

Half life: 6.007 hs.

Bq - Ci

09:34

28/03/2019

10,0 mCi

11:00

28/03/2019

8,48 mCi

- SELECT ISOTOPE
- PRINT

Figure 9. Mode I

VexCal03

22 Na Sodium-22	60 Co Cobalt-60	67 Ga Gallium-67	99m Tc Technetium-99m	111 In Indium-111	131 I Iodine-131	201 Tl Thallium-201
------------------------------	------------------------------	-------------------------------	------------------------------------	--------------------------------	-------------------------------	----------------------------------

MEASURE

DOSE

BACKGROUND ACTIVITY

CALCULATE DECAY

ACCURACY

INFORMATION

SETTINGS

EXIT

Tc99m

Technetium (Factor: 0.00327304)

Half life: 6.007 hs.

Bq - Ci

SELECT ISOTOPE

PRINT

09:35

28/03/2019

10,0 mCi

11:00

28/03/2019

8,49 mCi

Figure 10. Mode II

Registry of Accuracy with Patterns

This screen allows to store the pattern values and to follow their activity. You will be asked to enter a password (the first four characters of the serial number), after which you will see the following screen:

Sources

VexCal03

Serial number

ISOTOPE

Serial number

ACTIVITY VALUE Ci mCi uCi

DATE

TIME

MEASURE

DOSE

BACKGROUND ACTIVITY

CALCULATE DECAY

ACCURACY

INFORMATION

SETTINGS

EXIT

NEW

MODIFY

A

B

C

Figure 11. Accuracy

- A:** Select a reference source.
- B:** Modify and add a reference source.
- C:** Verify accuracy.

Select the source you want to use (**A**), place the pattern in the ionization chamber and select the accuracy verification (**C**). To save the measured values, press the **SAVE** button.

Sources

VexCal03

Serial number

MEASURE

DOSE

BACKGROUND ACTIVITY

CALCULATE DECAY

ACCURACY

INFORMATION

SETTINGS

EXIT

Na22

Sodium

2.602 years.

11:12

28/03/2019

REGISTER

0 uCi

100.00%

Figure 12. Accuracy

To add a new source, select Modify and add a reference source (**B**), complete the data in the screen and press the **NEW** button.

To modify an existing source, select the source (**A**) and press Modify and add a reference source (**B**), modify the corresponding values and press the **MODIFY** button.

VexCal03

Sources

MEASURE

DOSE

BACKGROUND ACTIVITY

CALCULATE DECAY

ACCURACY

INFORMATION

SETTINGS

EXIT

Serial number

ISOTOPE

Serial number

ACTIVITY VALUE

Ci mCi uCi

DATE

TIME

NEW

MODIFY

Figure 13. Register

Information Screen

This screen shows information on the institution and the dose calibrator. This information can be edited in the Information tab in the [Configuration](#) screen.

VexCal03









<div style="margin-bottom: 5px;"> MEASURE</div> <div style="margin-bottom: 5px;"> DOSE</div> <div style="margin-bottom: 5px;"> BACKGROUND ACTIVITY</div> <div style="margin-bottom: 5px;"> CALCULATE DECAY</div> <div style="margin-bottom: 5px;"> ACCURACY</div> <div style="margin-bottom: 5px; background-color: #0070c0; color: white; padding: 2px;"> INFORMATION</div> <div style="margin-bottom: 5px;"> SETTINGS</div> <div style="margin-bottom: 5px;"> EXIT</div>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>System</p> <input style="width: 95%;" type="text" value="VexCal"/></td> <td style="width: 50%; vertical-align: top;"> <p>Institution</p> <input style="width: 95%;" type="text" value="Institucion"/></td> </tr> <tr> <td style="vertical-align: top;"> <p>Serial number</p> <input style="width: 95%;" type="text" value="1234567890"/></td> <td style="vertical-align: top;"> <p>Address</p> <input style="width: 95%;" type="text" value="Direccion"/></td> </tr> <tr> <td style="vertical-align: top;"> <p>Firmware Version</p> <input style="width: 95%;" type="text" value="1.60"/></td> <td style="vertical-align: top;"> <p>Telephone</p> <input style="width: 95%;" type="text" value="Telefono"/></td> </tr> <tr> <td style="vertical-align: top;"> <p>Software Version</p> <input style="width: 95%;" type="text" value="1.7.1.0"/></td> <td style="vertical-align: top;"> <p>Responsible</p> <input style="width: 95%;" type="text" value="Responsable del area o Institucion"/></td> </tr> <tr> <td style="vertical-align: top;"> <p>Manufacturer</p> <input style="width: 95%;" type="text" value="Veccsa"/></td> <td></td> </tr> </table>	<p>System</p> <input style="width: 95%;" type="text" value="VexCal"/>	<p>Institution</p> <input style="width: 95%;" type="text" value="Institucion"/>	<p>Serial number</p> <input style="width: 95%;" type="text" value="1234567890"/>	<p>Address</p> <input style="width: 95%;" type="text" value="Direccion"/>	<p>Firmware Version</p> <input style="width: 95%;" type="text" value="1.60"/>	<p>Telephone</p> <input style="width: 95%;" type="text" value="Telefono"/>	<p>Software Version</p> <input style="width: 95%;" type="text" value="1.7.1.0"/>	<p>Responsible</p> <input style="width: 95%;" type="text" value="Responsable del area o Institucion"/>	<p>Manufacturer</p> <input style="width: 95%;" type="text" value="Veccsa"/>	
<p>System</p> <input style="width: 95%;" type="text" value="VexCal"/>	<p>Institution</p> <input style="width: 95%;" type="text" value="Institucion"/>										
<p>Serial number</p> <input style="width: 95%;" type="text" value="1234567890"/>	<p>Address</p> <input style="width: 95%;" type="text" value="Direccion"/>										
<p>Firmware Version</p> <input style="width: 95%;" type="text" value="1.60"/>	<p>Telephone</p> <input style="width: 95%;" type="text" value="Telefono"/>										
<p>Software Version</p> <input style="width: 95%;" type="text" value="1.7.1.0"/>	<p>Responsible</p> <input style="width: 95%;" type="text" value="Responsable del area o Institucion"/>										
<p>Manufacturer</p> <input style="width: 95%;" type="text" value="Veccsa"/>											

Figure 14. Information

Configuration Screen

The configuration will appear in the top tabs.

- **ADJUST FACTORS**
- **INFORMATION**
- **CONFIGURATION**
- **ELECTRONICS CALIBRATION**

Some of the configurations in this screen are password-protected because they are reserved for calibration and adjustment of the AV 03's internal electronics.

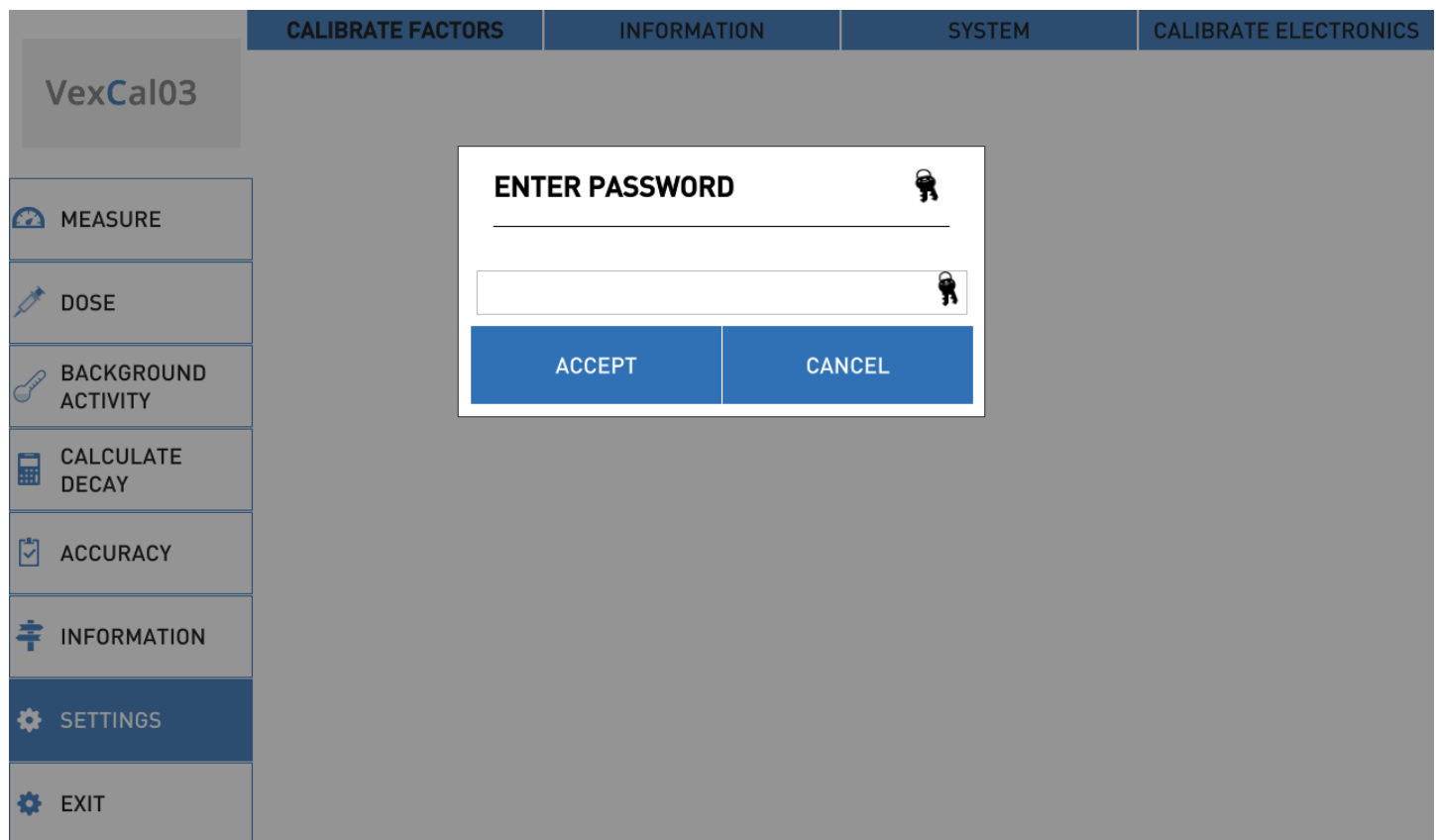
Adjust factors

This screen is password-protected. This is where the calibration of the isotopes is done.

The following shows how to calculate a new factor.

Example of factor calculation

Once you have started the application, go to the “Configuration” screen and then to “Adjust factors”. You will be asked to enter a password, which will be the first four (4) digits of the system’s serial number.



Then you will be asked to enter the sample in the well, after which you will have to press the “Next” button. In each of these screens you will see at the bottom the values selected in each step.



	CALIBRATE FACTORS	INFORMATION	SYSTEM	CALIBRATE ELECTRONICS
VexCal03	<p>Please insert the sample in the chamber</p> <p>Cancel Next</p>			
MEASURE				
DOSE				
BACKGROUND ACTIVITY				
CALCULATE DECAY				
ACCURACY				
INFORMATION				
SETTINGS				
EXIT				

Next you will have to select the isotope for calibration.

CALIBRATE FACTORS INFORMATION SYSTEM CALIBRATE ELECTRONICS

VexCal03

MEASURE
DOSE
BACKGROUND ACTIVITY
CALCULATE DECAY
ACCURACY
INFORMATION
SETTINGS
EXIT

Please select the isotope to calibrate

Tc97m

Isotope:
Value:
Range:

Cancel Next

Then you will be asked to enter the value of the sample and the range; the range can be uCi, mCi or Ci.

CALIBRATE FACTORS **INFORMATION** **SYSTEM** **CALIBRATE ELECTRONICS**

VexCal03

- MEASURE
- DOSE
- BACKGROUND ACTIVITY
- CALCULATE DECAY
- ACCURACY
- INFORMATION
- SETTINGS
- EXIT









Enter the sample value

23,2 Ci

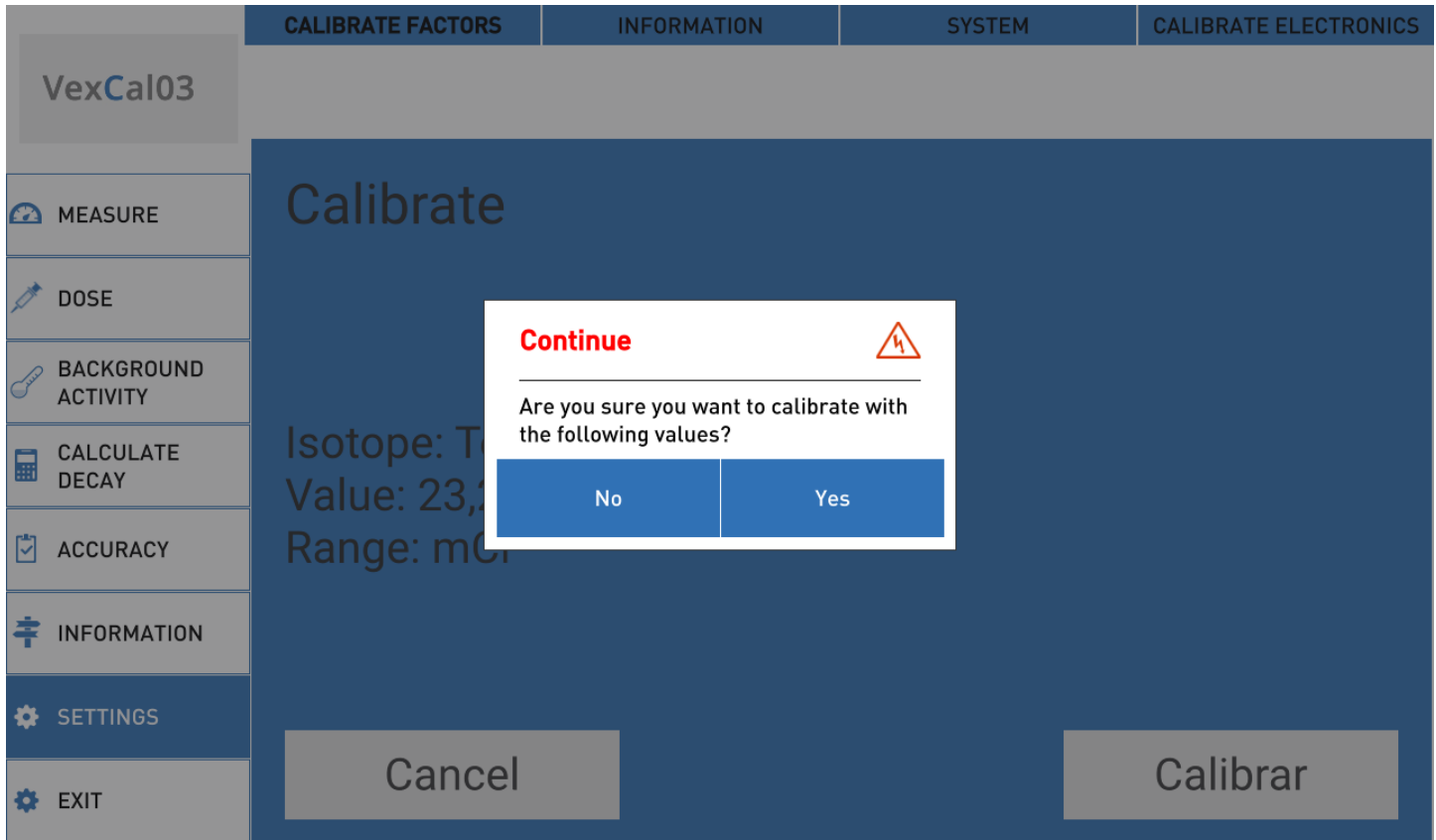
Isotope: Technetium Tc99m
Value:
Range:

Cancel Next

After this, the final screen will show the values you selected and the “Calibrate” button.

	CALIBRATE FACTORS	INFORMATION	SYSTEM	CALIBRATE ELECTRONICS
VexCal03				
 MEASURE	<h2>Calibrate</h2> <p>Isotope: Technetium Tc99m Value: 23,2 Range: mCi</p> <p><input type="button" value="Cancel"/> <input type="button" value="Calibrate"/></p>			
 DOSE				
 BACKGROUND ACTIVITY				
 CALCULATE DECAY				
 ACCURACY				
 INFORMATION				
 SETTINGS				
 EXIT				

When the Calibrate button is pressed, a confirmation message for the calibration will appear.



After a few seconds you will see a new screen showing the calibration progress.

	CALIBRATE FACTORS	INFORMATION	SYSTEM	CALIBRATE ELECTRONICS
VexCal03				
MEASURE	<div style="background-color: #2c5e8c; color: white; padding: 20px;"> <h2 style="margin: 0;">Calibrating</h2> <h1 style="margin: 0;">Factor: ..</h1> <p style="margin: 10px 0;">Isotope: Technetium Tc99m Value: 23,2 Range: mCi</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="background-color: #ccc; padding: 10px 20px; border: 1px solid #ccc;">Cancel</div> <div style="background-color: #ccc; padding: 10px 20px; border: 1px solid #ccc;">Save factor</div> </div> </div>			
DOSE				
BACKGROUND ACTIVITY				
CALCULATE DECAY				
ACCURACY				
INFORMATION				
SETTINGS				
EXIT				

In this screen the dots indicate that the calibration is in progress; once it is done, the calculated factor is shown. If after 20-30 seconds the process is not complete, you should cancel the calibration and restart the procedure.

CALIBRATE FACTORS | **INFORMATION** | **SYSTEM** | **CALIBRATE ELECTRONICS**

VexCal03

- MEASURE
- DOSE
- BACKGROUND ACTIVITY
- CALCULATE DECAY
- ACCURACY
- INFORMATION
- SETTINGS
- EXIT

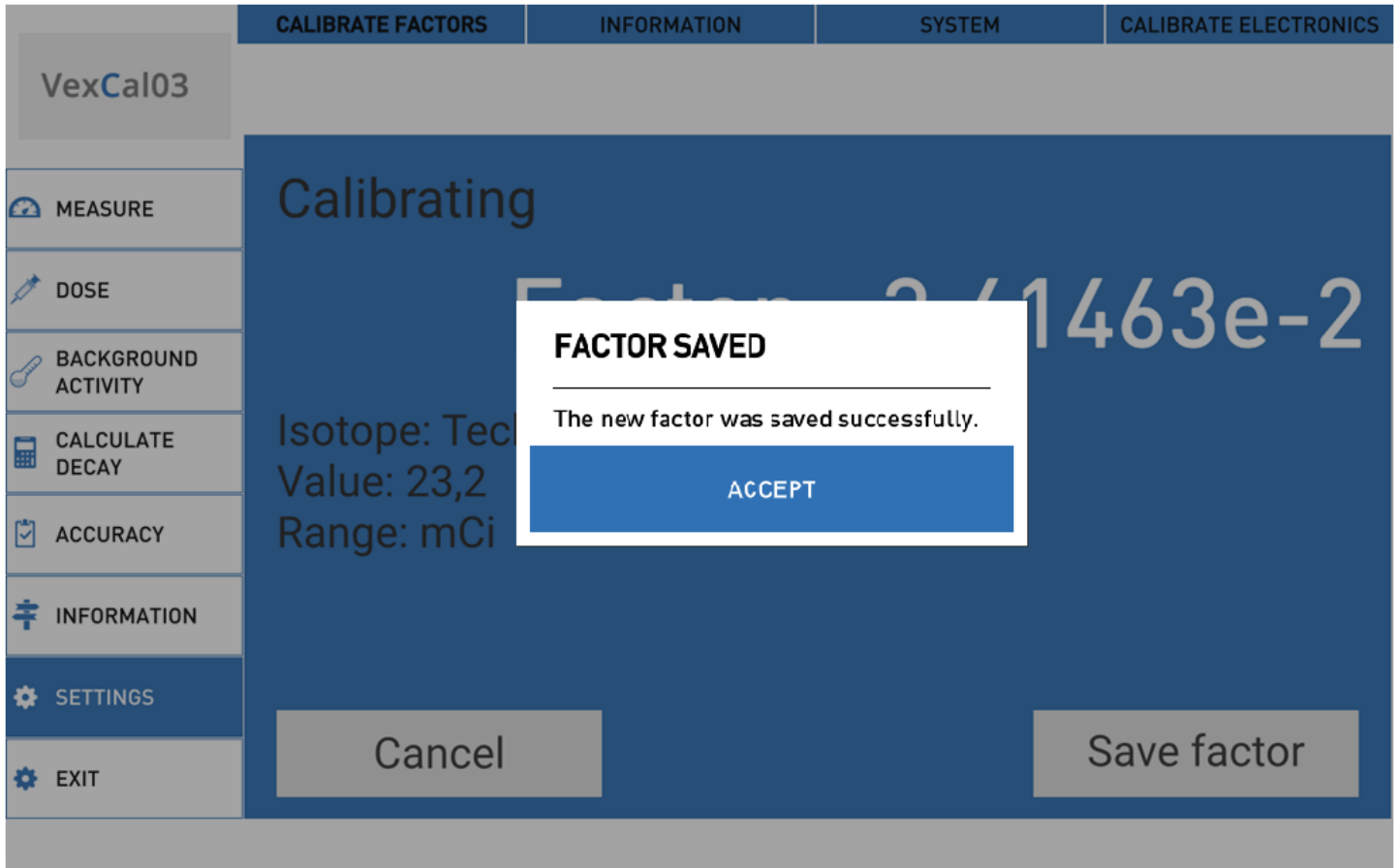
Calibrating

Factor: $3.41463e-2$

Isotope: Technetium Tc99m
Value: 23,2
Range: mCi

Cancel | Save factor

If you try to exit without saving the factor, a warning message will appear. To save it, press the “Save factor” button. After a few seconds a message will indicate whether the factor has been successfully saved or a problem has occurred.



Once you accept this message, you will move on to the measuring screen, where you will see the updated factor.

VexCal03

99m
Tc
Technetium-99m

11
C
Carbon-11

24
Na
Sodium-24

32
P
Phosphorus-32

40
K
Potassium-40

47
Ca
Calcium-47

MEASURE

DOSE

BACKGROUND ACTIVITY

CALCULATE DECAY

ACCURACY

INFORMATION

SETTINGS

EXIT

Tc99m

11:43
 28/03/2019

Technetium (Factor: 0.003)
Half life: 6.007 hs.

23,3 mCi

Bq - Ci

SELECT ISOTOPE

PRINT

SUBTRACT BACKGROUND

Information

To complete the institution information, select the **INFORMATION** section and then complete the fields. You need to press **SAVE** to store the data you filled in.


		CALIBRATE FACTORS	INFORMATION	SYSTEM	CALIBRATE ELECTRONICS
VexCal03					
<ul style="list-style-type: none"> MEASURE DOSE BACKGROUND ACTIVITY CALCULATE DECAY ACCURACY INFORMATION SETTINGS EXIT 	 SAVE				
	Institution <input type="text" value="Institucion"/>				
	Address <input type="text" value="Direccion"/>				
	Telephone <input type="text" value="Telefono"/>				
	Responsible <input type="text" value="Responsable del area o Institucion"/>				

Figure 15. Configure the information

System

In this screen you can configure the system. The options are the interface language and the frequency of the power network that the dose calibrator is connected to. The value of the network's frequency will be used to improve the accuracy of the results. If the frequency is not configured correctly, the dose calibrator will still work, but the accuracy of the results might be lower.

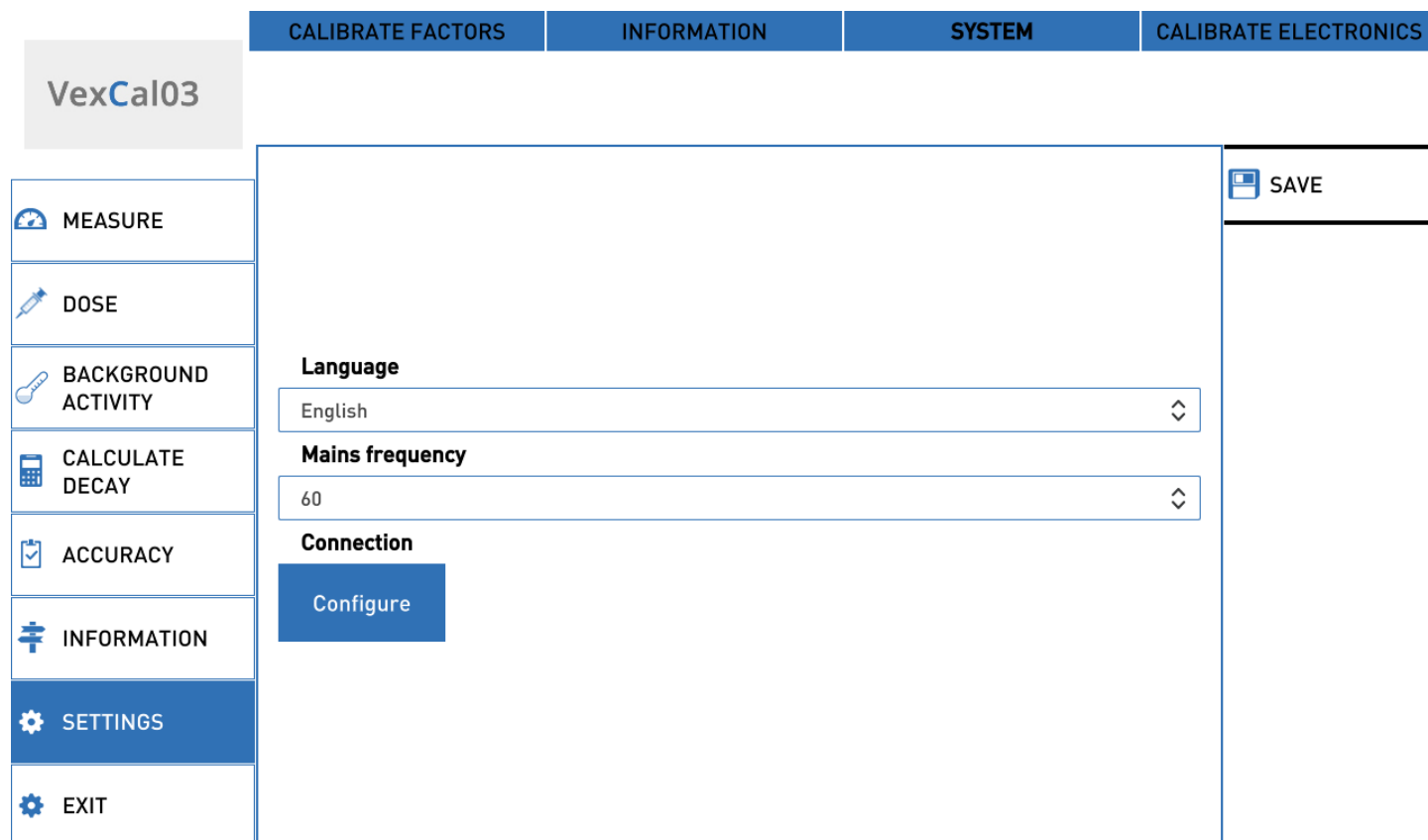


Figure 16. System Screen

Electronics calibration

This screen is password-protected. The calibration of the electronics must only be done by a technician authorized by the manufacturer. If the calibration of the electronics is not done properly, it could cause the dose calibrator to stop working.

System maintenance

Cleaning and maintenance of the unit

Do not clean the system with solvents of any kind. To clean it use a cloth with detergent diluted in water.

Cleaning instructions

- Turn off the system and disconnect it from the power supply.
- Clean the exterior of the chamber and the accessories with a wet cloth. Use a soft detergent diluted in water.
- Dry them with a clean soft cloth or with paper towels.
- Connect all the cables.
- Connect the system to the power network.
- Turn on the system.

In case of radioactive contamination, follow the institution's procedures to contain the problem.

Software maintenance

The system comes with a version of the software preinstalled in a tablet with Android operating system. To receive updates of the application you will have to:

- Have a WiFi internet connection.
- Configure the tablet to use this network.
- Have a Google account, or create a new one, and sign in from the tablet to have access to Google Play.

Storage and Transportation

If you need to store the system for a period of time, choose a dry place, without dust or corrosive agents.

The conditions for storage and transportation are:

- Temperature: between 0 and 60 °C
- Atmospheric pressure: between 700 and 1060 hPa
- Relative humidity: between 0% and 95%, without condensation

Disposal of the system

Dispose of the system and its accessories according to local laws.

Follow national regulations for recycling or the recycling policy of your center to guarantee the correct disposal of the system and its accessories. If you wish to obtain more information on recycling, call the local Agency for environmental protection.

Regulation compliance

Standards

The system is designed to comply with

IEC/EN 61010-1	IEC/EN 61010-2-101
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Technical Specifications

- Ionization chamber with pressurized Argon
- Dimensions of the well: 7,3 cm. x 26,4 cm.
- Shielding: 3mm lead.
- Shielding with lead rings for high energy isotopes (optional)
- Measurement range: 1uCi to 5Ci
- Time between measurements: 1 second
- Maximum stabilization time: 25 seconds for samples of <100uCi
- Continuous measurement
- $\pm 5\%$ accuracy
- Calculation of future dose for the current sample
- Calculation of decay for all saved isotopes
- Library with 179 isotopes available for calibration, expandable to 333
- Touch interface on tablet
- USB connection to tablet

- Back-up battery (two Li-Ion cells) for the system to keep working in case of power outage
- Power: 12VDC 2A
- Weight: 15 kg
- Operating temperature: between 0 and 40 °C
- Operating atmospheric pressure: between 700 and 1060 hPa
- Operating humidity: between 0% and 95%, without condensation

Accessories

The system is delivered with the following accessories:

- 10.1" tablet screen with Android operating system
- USB cable
- 12V 2A power source
- Sample holder
- Tablet stand

Optional accessories

- Shielding with lead rings for high energy isotopes such as ^{18}F
- Wireless printer (Bluetooth)