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Configuration & Calibration

Mobile X-ray Unit

REVISION HISTORY

REVISION	DATE	REASON FOR CHANGE
0	SEP 28, 2022	First Edition.

This Document is the English original version, edited and supplied by the manufacturer.

The Revision state of this Document is indicated in the code number shown at the bottom of this page.

ADVISORY SYMBOLS

The following advisory symbols will be used throughout this manual. Their application and meaning are described below.

DANGERS ADVISE OF CONDITIONS OR SITUATIONS THAT IF NOT HEEDED OR AVOIDED WILL CAUSE SERIOUS PERSONAL INJURY OR DEATH.

ADVISE OF CONDITIONS OR SITUATIONS THAT IF NOT HEEDED OR AVOIDED COULD CAUSE SERIOUS PERSONAL INJURY, OR CATASTROPHIC DAMAGE OF EQUIPMENT OR DATA.

Advise of conditions or situations that if not heeded or avoided could cause personal injury or damage to equipment or data.

Note ☞

Alert readers to pertinent facts and conditions. Notes represent information that is important to know but which do not necessarily relate to possible injury or damage to equipment.

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SECTION 1 PRELIMINARY CONSIDERATIONS

Note ☞ *This Mobile Unit has been configured, calibrated and tested by the Manufacturer.*

No service intervention is necessary since the system is ready for normal operation.

None of the procedures indicated in this chapter of the Service Manual should be necessary upon first run, unless esteemed otherwise.

Note ☞ *Configuration and Calibration should only be performed by Service Engineers who are specialized in servicing this specific Mobile Unit.*

Note ☞ *Before performing the Configuration and Calibration, verify that the Unit has been connected to the mains for at least eight (8) hours. This will ensure a complete and full Battery charging.*

The required tools and test equipments are listed on the Startup Primer document of this Service Manual.

1.1 CONFIGURATION

Configuration provides the initial settings and checkout procedures that must be carried out before making X-ray exposures. Functional characteristics of this Generator are defined at this time.

When the initial setup and checkout are complete, the Generator is ready for Calibration.

THE MAIN CAPACITORS OF THE HIGH VOLTAGE INVERTER RETAIN A LARGE PORTION OF THEIR CHARGE FOR A FEW AFTER THE UNIT IS TURNED OFF.

The Generator characteristics, power, options and allowed configuration are saved in a licence key plugged on the *Advanced Control Board A3678-XX.*

1.2 BASIC CONFIGURATION OF BOARDS

Note ☞ *The following PCB are factory set as described in the following Tables:*

ADVANCED CONTROL BOARD (ACB) A3678-XX		
SWITCH	**POSITION**	
SW1-1	ON	
SW1-2		OFF
SW3-1		OFF
SW3-2		OFF
SW3-3		OFF
SW3-4		OFF
SW3-5		OFF
SW3-6		OFF
SW3-7		OFF
SW3-8		OFF

UNIVERSAL ADVANCED ROTOR CONTROL (UARC) BOARD A3615-XX		
SWITCH	**POSITION**	
SW1-1		OFF
SW1-2		OFF
SW1-3		OFF
SW1-4		OFF
SW2-1		OFF
SW2-2		OFF
SW2-3		OFF
SW2-4		OFF
SW2-5		OFF
SW2-6	ON	
SW2-7		OFF
SW2-8		OFF

ADVANCED DIGITAL MOTION CONTROL (ADMC) BOARD A3686-XX		
SWITCH	**POSITION**	
SW2-1		OFF
SW2-2		OFF
SW2-3		OFF
SW2-4		OFF
SW2-5		OFF
SW2-6		OFF
SW2-7		OFF
SW2-8	ON	

HANDLEBAR: CAPACITIVE SWITCH SENSOR A40024-XX		
SWITCH	**POSITION**	
SW1-1		OFF
SW1-2		OFF
SW1-3		OFF
SW1-4		OFF
SW2-1		OFF
SW2-2		OFF
SW2-3		OFF
SW2-4		OFF

GENERAL PURPOSE INPUT/OUTPUT (GPIO) HEAD A40004-XX		
SWITCH	**POSITION**	
SW1-1	ON	
SW2-1		OFF
SW2-2		OFF
SW2-3	ON	
SW2-4		OFF
SW2-5	ON	
SW2-6		OFF
SW2-7		OFF
SW2-8		OFF
SW4-1		OFF
SW4-2		OFF
SW6-1		OFF
SW6-1		OFF

Note ☞ *For detailed information on Boards components refer to Central Listings Chapter of the Service Manual.*

SECTION 2 UNIT SERVICE MODE

The ***Service Tool*** application is the main utility that allows access to the Service functionalities of the Mobile X-ray Unit, such as calibration of the generator and various positioner elements, configuration of Unit components and system options, operator and usability settings or maintenance tasks.

All these functionalities of the Service Tool are also integrated into the console software of the Head-Assembly Screen.

Access to the Unit Service Mode via these tools is detailed in the following subsections.

2.1 SERVICE MODE ACCESS

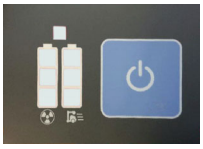
2.1.1 SYSTEM ON

The system *ON/OFF* controls are the means to turn the unit ON and OFF.

The system in the ON status switches ON the Generator, allowing the Mobile motion and next, launching the *Image Acquisition Software* on the Control Console for radiographic operation.

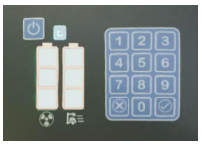
Note ☞ *For further information, refer to the Operator Manual.*

There are three options to turn ON the system, depending on the system configuration:



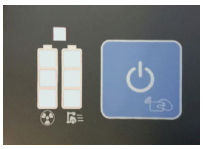
- ***ON/OFF Button*.**

  The *ON/OFF Button* is the means to turn the unit ON/OFF.



- ***ON/OFF Button + Keypad System*.**

  The *ON/OFF Button* with the *Keypad* are the means to turn the unit ON/OFF.



- ***Smart ON/OFF System*.**

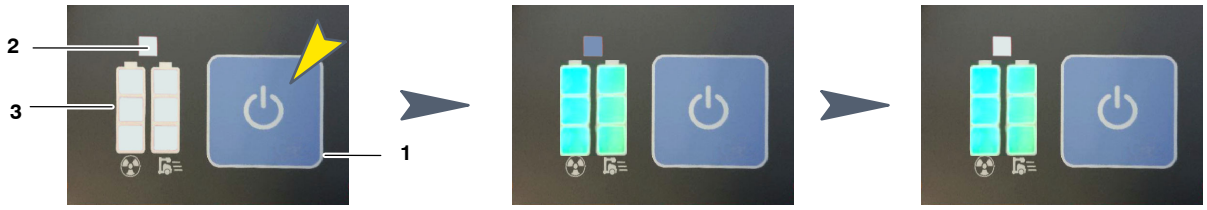
  The *ON/OFF Button* and the *RFID System* (*RFID-Card* and *RFID Card Reader*) are the means to turn the unit ON/OFF.

2.1.1.1 ON/OFF BUTTON

To turn the unit ON, proceed as described in the following steps:

1. Press and hold the *ON/OFF* button (1) for a few seconds; the *System ON/OFF Indicator* (2) will light cyan for a few seconds and the *Battery Charge Level Indicator* (3) will light according to the current battery status.

2. When the system is ON the *System ON/OFF Indicator* (2) will light white.



The system in the ON status switches ON the Generator, allowing the Mobile motion and then, the *Image Acquisition Software* for Radiographic operation will be launched on the Control Console.

Note ☞ *Once the system is turned ON, proceed as described in Section 2.1.2 to access to the Service Tool and the Login Screen.*

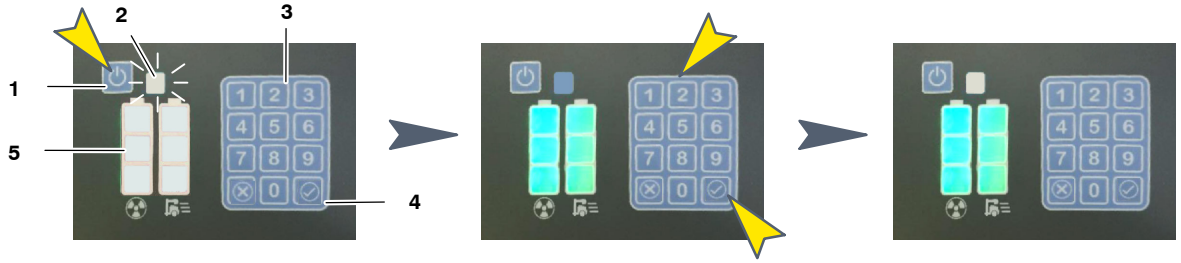
2.1.1.2 ON/OFF BUTTON + KEYPAD SYSTEM

To turn the unit ON, proceed as described in the following steps:

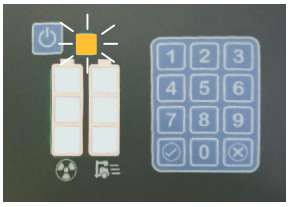
1. Press and hold the *ON/OFF* button (1) for a few seconds; the *System ON/OFF Indicator* (2) will blink white for 5 seconds.

2. Enter the four-digit Access Code [1234] into the Keypad (3), within 5 seconds from turning the unit ON, and press the OK button (4); the *System ON/OFF Indicator* (2) will light cyan and the *Battery Charge Level Indicator* (5) will light according to the current battery status.

3. When the system is ON, the *System ON/OFF Indicator* (2) will light white.



Note ☞ *The system emits 3-beeps and the System ON/OFF Indicator Indicator (2) blinks orange to indicate that a wrong code has been entered; in this case, repeat the ON/OFF process.*



The system in the ON status switches ON the Generator, allowing the Mobile motion and then, the *Image Acquisition Software* for Radiographic operation will be launched on the Control Console.

Note ☞ *Once the system is turned ON, proceed as described in Section 2.1.2 to access to the Service Tool and the Login Screen.*

CHANGE ACCESS CODE

Switch the Unit on, enter the four-digit Access Code **"1234"** and press the *OK button* (4). To change the code number, press and hold "*1*", "*3*" and the *OK* button (4). The *ON/OFF Indicator* lights magenta. After that, you have 10 seconds to enter the new code number. If this process is not finished, the *ON/OFF Indicator* (2) lights white.

Four numbers are required. Enter the new four-digit access code and press the *OK button* (4). The new code number has been saved. Once the new code number has been configured, use it to access the next time: a double beep is emitted meaning that the authentication has been successful. On the contrary, if the identification fails (i.e. three numbers instead of four have been entered or the four digits are incorrect), three beeps are emitted and the *ON/OFF Indicator* (2) blinks orange.

Note ☞ *The Mobile Unit must remain turned ON while this process takes place.*

RESET ACCESS CODE

If a new code number is forgotten, it can be reset to the factory default code **"1234"** by pressing 1 and 3 followed by the *Cancel Button* (6). The operation is confirmed by a double beep that is emitted. This process can be done with the system switched off.

Note ☞ *The Mobile Unit must remain switched OFF while this process takes place.*

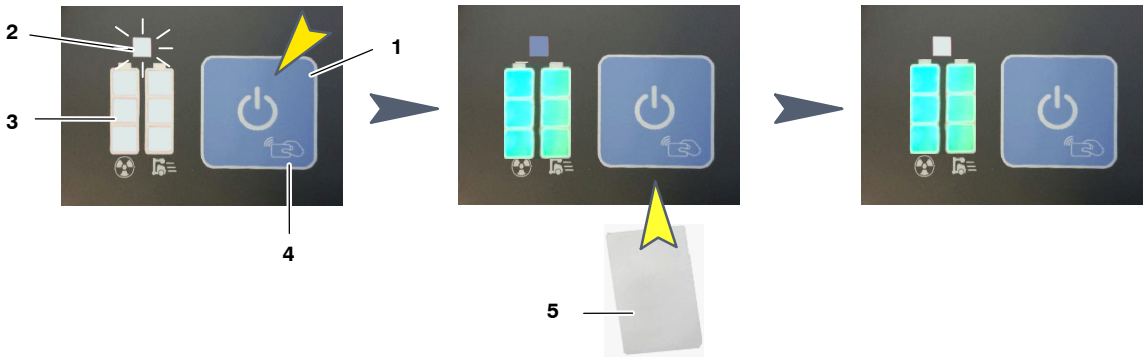
2.1.1.3 SMART ON/OFF SYSTEM: ON/OFF BUTTON + RFID SYSTEM

To turn the unit ON, proceed as described in the following steps:

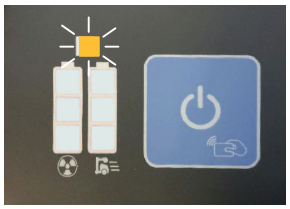
1. Press and hold the *ON/OFF* button (1) for a few seconds; the *System ON/OFF Indicator* (2) will blink white for 5 seconds.

2. Within 5 seconds from turning the unit ON, pass the *RFID Card* (5) over *RFID Reader* symbol (4), there is no need to contact the reader. The system emits a double beep, the *ON/OFF Indicator* (2) will light cyan and the *Battery Charge Level Indicator* (3) will light according to the current battery status.

3. When the system is ON the *System ON/OFF Indicator* (2) will light white.



Note ☞ *The system emits 3-beeps and the System ON/OFF Indicator (2) blinks orange to indicate a wrong RFID Card. In this case, repeat the ON/OFF process using the right Card.*



The system in the ON status switches ON the Generator, allowing the Mobile motion and then, the *Image Acquisition Software* for Radiographic operation will be launched on the Control Console.

Note ☞ *Once the system is turned ON, proceed as described in Section 2.1.2 to access to the Service Tool and the Login Screen.*

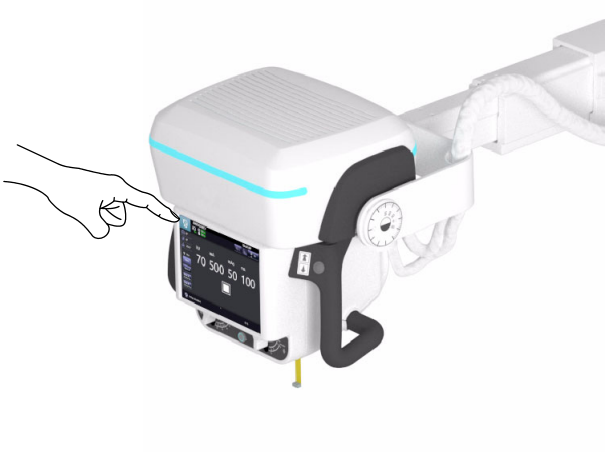
2.1.2 SERVICE MODE ACCESS TYPES

2.1.2.1 CONSOLE ON THE THE HEAD-ASSEMBLY SCREEN (WITH 4-SECTION ARM ONLY)

Access from the Console on the Head-Assembly Screen (if installed) is the most suitable option to prevent closing the acquisition software.

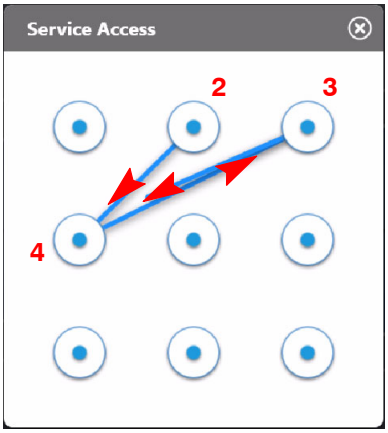
It is also recommended to access the service functionalities in this way when usability, operation or maintenance adjustments are required.

To access the Service Mode, touch and hold for a few seconds on the System Status icon, located at the upper left corner of the Console on the Head-Assembly Screen.

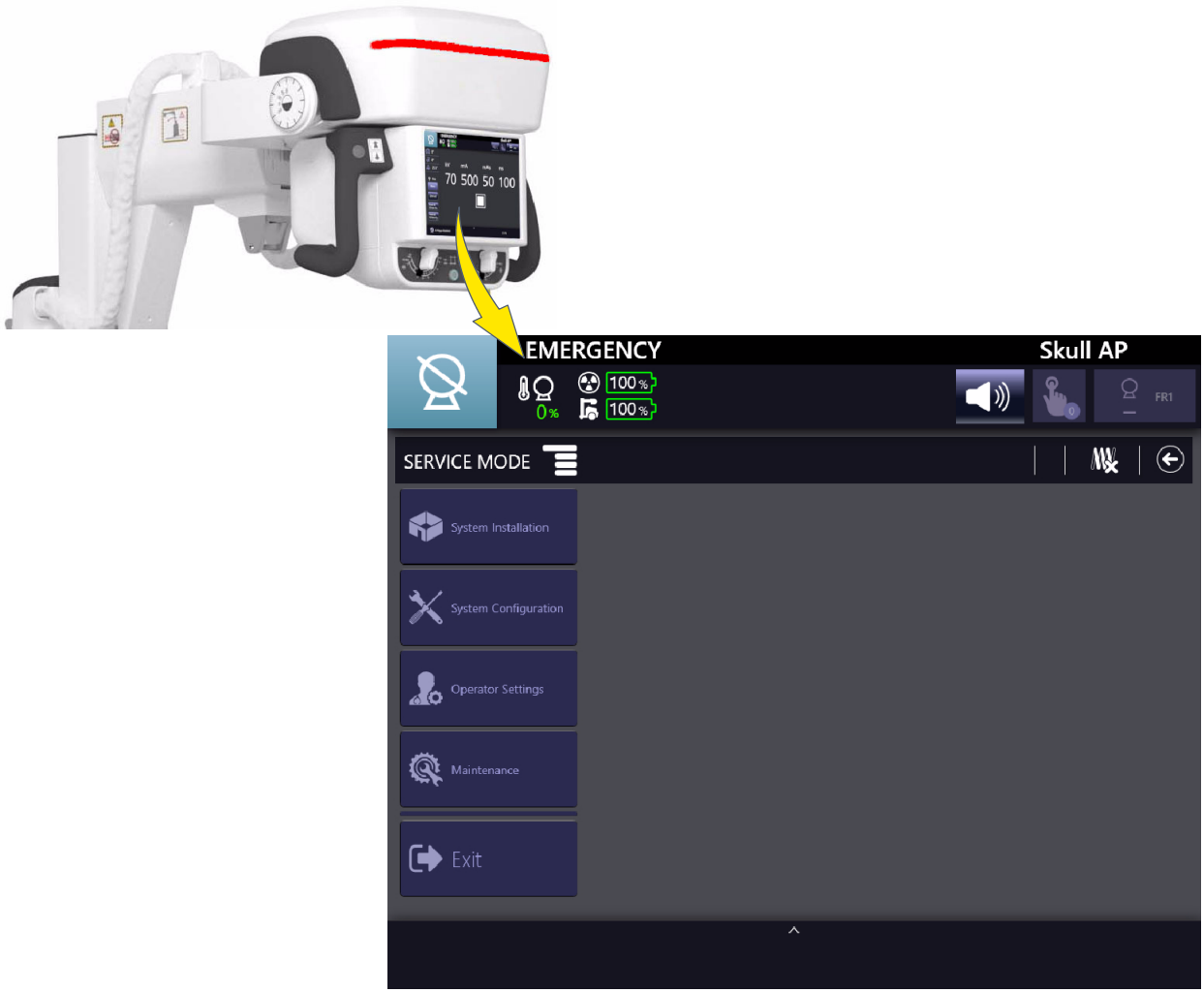


After a few seconds, the Service Access Login screen will be displayed.

A password is required to access the Service Mode. Draw the unlock pattern **2—4—3—4** by dragging the finger/stylus on the Login screen, as shown in the following illustration.



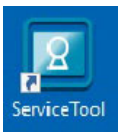
Finally, the Status Light Indicator at the Head-Assembly turns red and the Service Mode Main Menu is displayed *(refer to Section 2.4)*.



2.1.2.2 SERVICE TOOL ON THE MAIN SCREEN

Access the *Service Tool* from the Control Console on the Main Screen is recommended when performing calibration procedures due to the larger size and higher resolution of the screen, which will allow to visualize graphs and radiographic values with improved accuracy. It is also the only way to access the Service Mode if the Unit has a 3-Section Arm and does not have the Head screen.

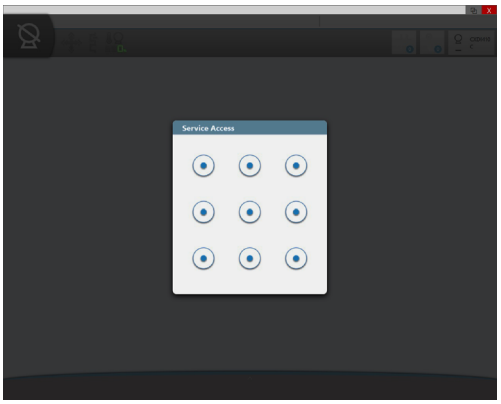
Note ☞ *Most of the images contained throughout this chapter correspond to screenshots of the Service Tool.*



Double-tap on the “Service Tool” shortcut of Windows desktop / start menu to launch the *Service Tool* application.

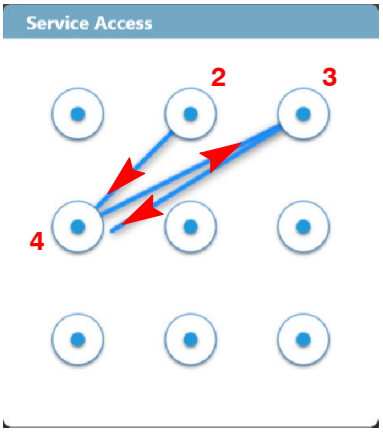
Note ☞ *Otherwise, start the Service Tool in the path:*
C:\Program Files (x86)\Sedecal\Service Tool\Service Tool.exe
(this is the path by default after installing the application).

After a few seconds, the Service Access Login screen will be displayed.



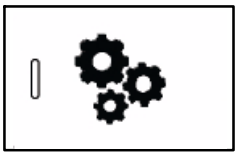
A password is required to access the Service Mode. Draw the unlock pattern **2—4—3—4** by dragging the finger/stylus on the Login screen, as shown in the following illustration.

Illustration 2-1
Service Access Login



Finally, the Status Light Indicator at the Head-Assembly turns red and the Service Mode Main Menu is displayed *(refer to Section 2.4)*.

2.1.2.3 SERVICE MODE PROTECTION



For Systems provided with the Service Protection Mode feature, the Service Personnel are allowed to access directly to the Service Mode Menu, by using an **Service RFID Card** with Service Permission. *Refer to Section 2.4.4.7 for detailed information about RFID Cards management*.

This Service RFID Card is located in a Card Holder mounted inside of the Unit, under the Inner Bin of the Detector Storage/Charge area on the Back Holder.

Pull out the Separating Plate of the Back Holder, in order to gain access to the Service Card Holder.

Illustration 2-2
Service RFID Card Holder Location

In this case, no Login Screen will appear on the screen, since the system opens directly the Service Mode / Service Tool Main Menu.

Illustration 2-3
Service Mode Main Menu

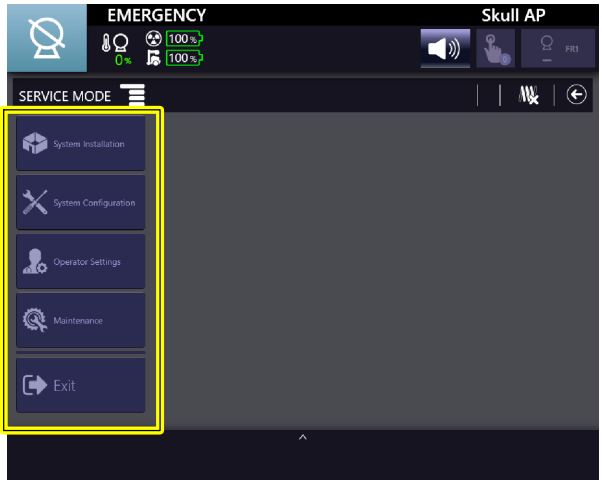
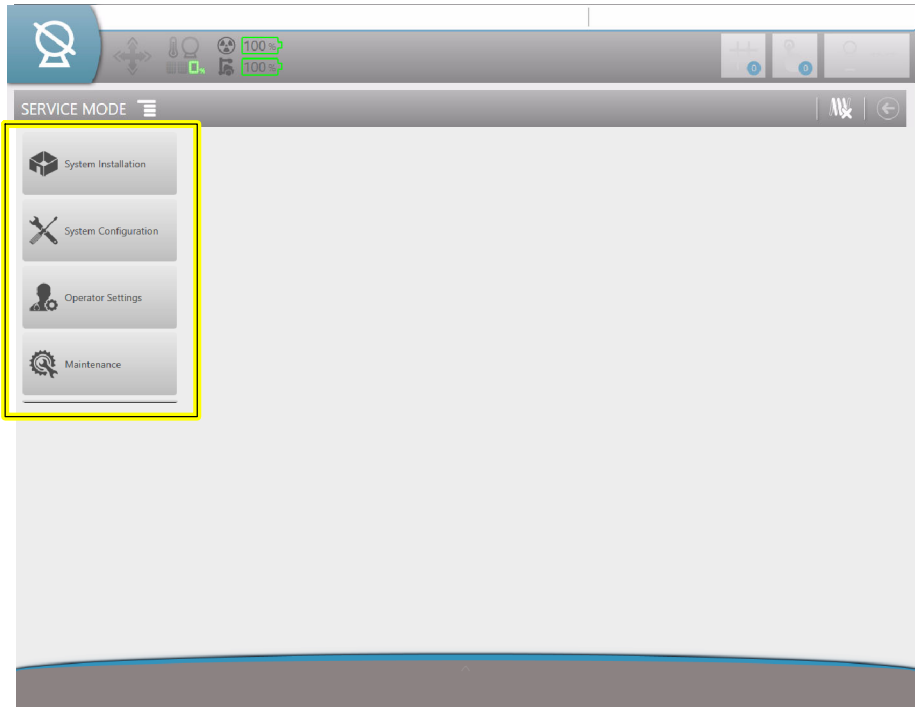


Illustration 2-4
Service Tool Main Menu



2.1.3 SYSTEM OFF

CAUTION

Place the unit in the Parking position right after turning the system OFF since positioning controls will remain enabled for 15 seconds approximately.

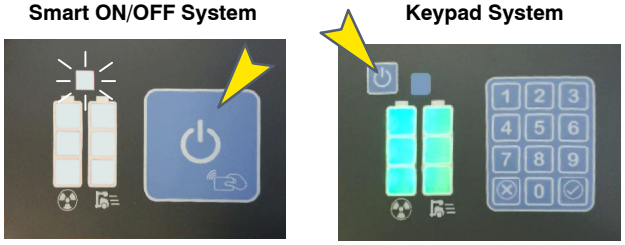
Note ☞ *Shut down the system only as described in this Section 2.1.3 and in the Operator Manual. Otherwise, the system will not perform a proper shutdown.*

Note ☞ *After turning OFF the unit, wait at least 10 seconds before turning it ON again. This action assures a safely start-up of the system.*

To turn the Unit OFF, proceed as described in the following steps:

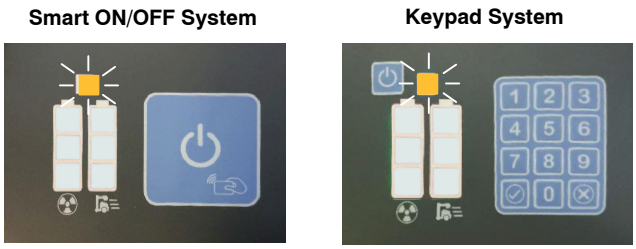
1. Turn OFF the system from the Control Panel, by holding pressed the *ON/OFF* button for 3 seconds approximately.

Smart ON/OFF System **Keypad System**



2. The system ON/OFF Indicator will light cyan for a few seconds and then, the Unit will be turned OFF.

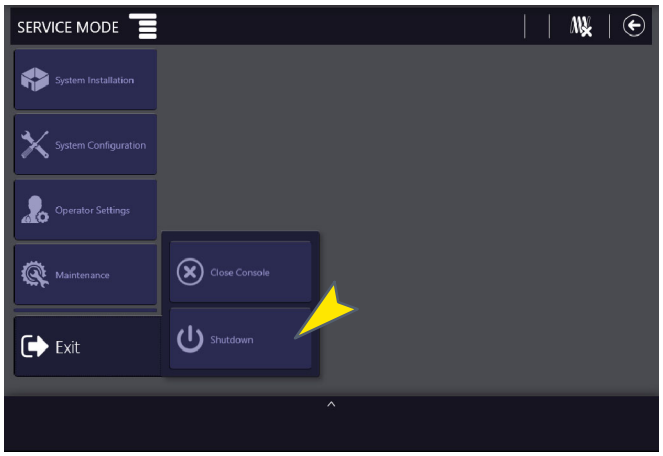
Smart ON/OFF System **Keypad System**



Note ☞ *If the system does not turn OFF after pressing the ON/OFF button for 3 seconds, try it again by holding pressed the ON/OFF button for 12 seconds approximately; it will turn OFF the system safely.*

Alternatively, it is possible to shut down the unit from the Service Mode of the Head-Assembly Console:

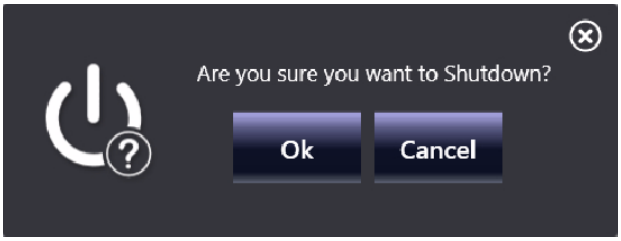
1. Press the “Exit”· button from the Service Mode Main Menu and select the “Shutdown” option by pressing on it.



THE “CLOSE CONSOLE” OPTION CLOSES THE CONTROL APPLICATION OF THE HEAD-ASSEMBLY CONSOLE. THIS ACTION DOES NOT INVOLVE A GENERATOR SHUTDOWN, SO UNINTENTIONAL EXPOSURES MAY OCCUR.

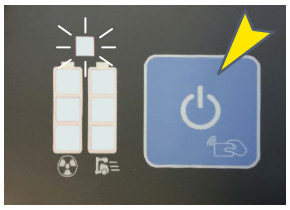
THIS BUTTON IS INTENDED ONLY FOR SPECIFIC MAINTENANCE TASKS. AVOID SELECTING THIS OPTION IN ANY OTHER CASE.

2. A pop-up confirmation window will be displayed. Press the “Ok” button and the, the Unit will be turned OFF.

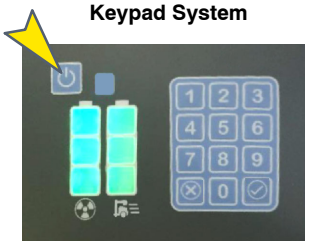


3. If after a while, the Unit Power OFF sequence is not completed, press and hold the ON/OFF button for 12 seconds approximately. After that, the Unit will turn OFF safely.

Smart ON/OFF System

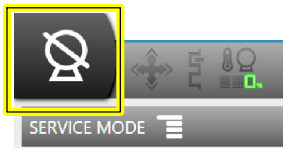


Keypad System



2.2 SERVICE MODE: ICONS AND BUTTONS

The following icons and buttons can be displayed in the Service Mode / Service Tool screens:



SYSTEM STATUS ICONS

The status of the system is indicated by different icons in the left upper corner of the Service Mode screen. This status can be as follows:

- **Inhibition Conditions (Enabled Filaments).**
  There are one or more reasons causing an inhibition of exposure, despite the Tube Filaments being properly enabled.

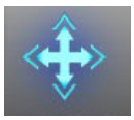
- **Inhibition Conditions (Disabled Filaments).**
  There are one or more reasons causing an inhibition of exposure. When the Filaments are disabled (regardless of whether they have been deactivated via software or some other issue), the inhibition status icon is shown in blue.

- **Normal Status.**
  The Detector is ready, the RAD technique is correctly set and there is not Error or Interlock condition in the system.

- **Handswitch Pressed.**
  The Handswitch has been pressed half-way (*"Prep"* position) to prepare the X-ray Tube for Exposure.

- **Ready.**
  The system is prepared for the Exposure.

- **Exposure.**
  Active during the Exposure.



SYSTEM MOVEMENTS

The system movements are indicated by this icon, by activating the blink of the inner arrows.

HEAT UNITS

Shows the used Heat Units of the Generator.
The Heat Units are calculated and totalled during exposures.

BATTERY CHARGE LEVEL INDICATORS

These icons show the Battery Level for X-ray Operation (upper icon) and the Battery Level for Motion (lower icon).

ENABLED FILAMENTS

This button indicates that filaments are enabled; radiation will be produced during the exposure.
Press onthis icon to disable filaments.

DISABLED FILAMENTS

This button indicates that filaments are disabled; no radiation will be produced during the exposure.
Press on this icon to enable filaments.

COLLIMATOR BLADES

USER ACTION REQUIRED

SELECTED DETECTOR

BACK

Press on the “Back” button to leave the current menu. This icon can be found in every menu of the Service Mode to turn back to the Service Mode Main Menu.

Note ☞

The “Back” button can be also used to close the Service Mode from its Main Menu. In this case, the Console on the Head-Assembly will again show the Operation Mode on the screen. If configuration changes have been performed, a reboot may be required to transfer the new data to the Generator.

REDUCE/RESTORE SERVICE TOOL SCREEN

Prees on this button to reduce/restore the Service Tool screen (*only available in the Main Screen*).

EXIT SERVICE TOOL

Press the “Exit” button to log OFF the Service Tool (*only available in the Main Screen*).

NEXT STEP

Press to proceed to the next Calibration step or to skip the current one before starting its Calibration.

PREVIOUS STEP

Press to return to the previous Calibration step.

RESTORE DATA

Press to load the client’s factory configuration data.

STORE DATA

Press to save the modified values.

The following controls may appear along the Generator Setup menus:

SMALL FOCUS

Press on the “Small Focus” button to select the Tube Small Focus Spot.

LARGE FOCUS

Press on the “Large Focus” button to select the Tube Large Focus Spot.

START CALIBRATION

Press on the “Start” button when it is active at any Calibration step, to start the current Calibration process.

CANCEL CALIBRATION

Press on the “Cancel” button when it is active at any Calibration step, to cancel the current Calibration process.

SLIDER

Rough adjustment:

Touch and drag the slider cursor to the left or right for decreasing or increasing the value, until reaching a rough value.

Accurate Adjustment:

Touch and hold the fingertip on the slider cursor, for decreasing or increasing the value quickly.

Once reached an approximate value, touch and release the cursor for decreasing or increasing the value step by step, repeating as many times as necessary until reaching the accurate value.

2.3 SERVICE MODE: MEASURING DEVICES

Note ☞ *Before entering to the Service Mode, in order to perform some of the Calibration processes, bear in mind that some covers must to be removed and the following tools may be needed.*

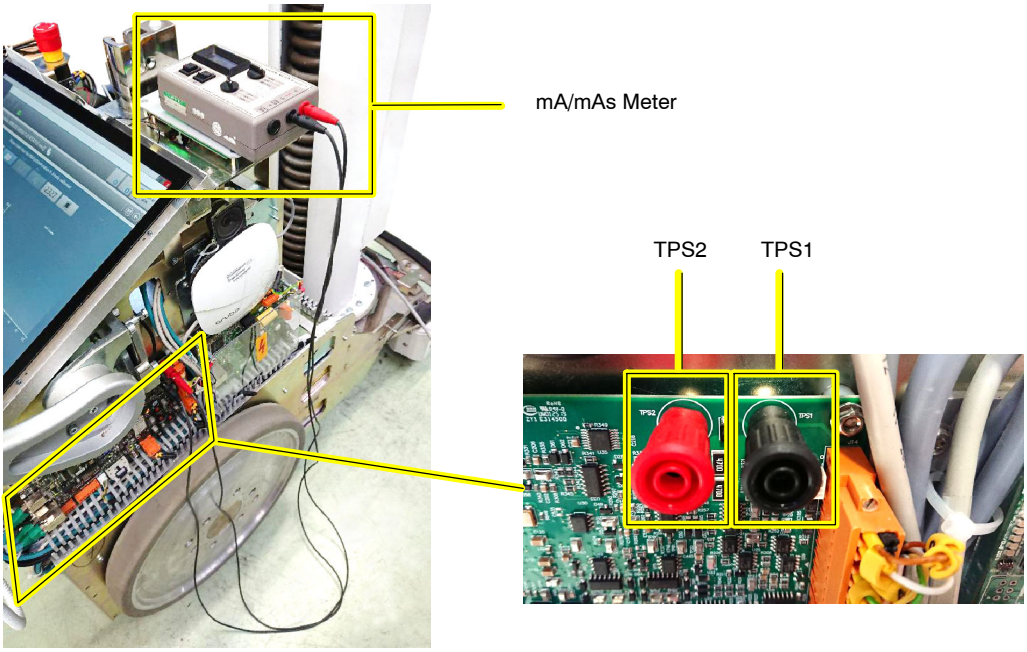
mA/mAs Meter:

Use a mA/mAs meter to measure mA/mAs.

With the Generator power OFF, remove the required covers to gain access to the Advanced Control Board A3678-XX.

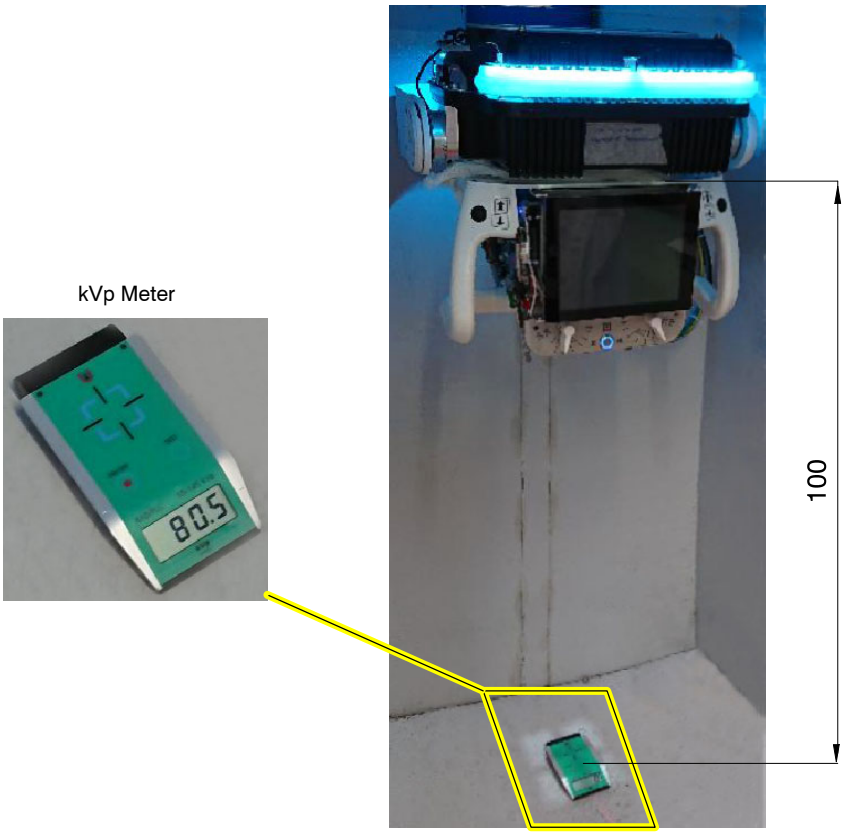
Remove the link between TPS1 and TPS2 and connect the mA/mAs meter, as shown in the next picture.

Then, Switch ON the system, initialize the Service Tool and proceed with the corresponding Calibration process.



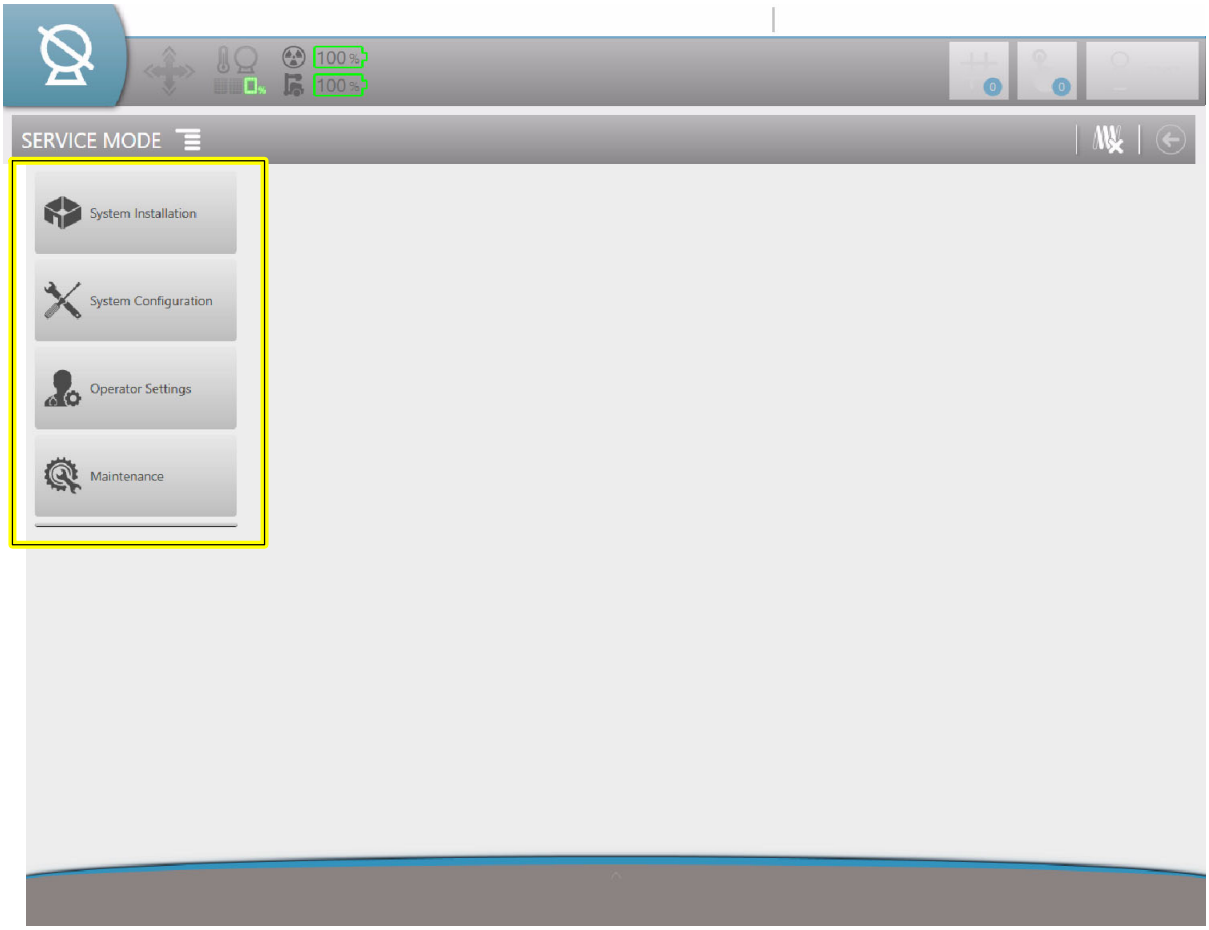
Non-invasive kVp meter:

Use a non-invasive kVp meter to measure kVp; place it under the Ray beam at a SID of 100 cm., aligned with the Collimator light, as shown in the next picture.

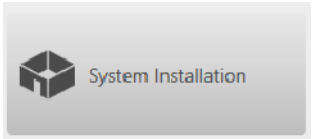


2.4 SERVICE MODE: MAIN MENU

Illustration 2-5
Service Mode Main Menu



The following options are displayed in Service Mode main menu:



SYSTEM INSTALLATION

Refer to Section 2.4.1.

Press on the "System Installation" button to display the options used to calibrate the System.

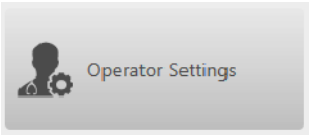
Note ☞ *It is recommended to check the "System Configuration" data before performing the Calibration of the system.*

SYSTEM CONFIGURATION

Refer to Section 2.4.2.

Press on the “System Configuration” button to display the options used to select the different components of the Unit and the System configuration options.

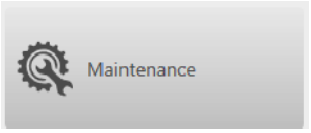
Note ☞ *Refer to the System Configuration data before performing a system Calibration.*



OPERATOR SETTINGS

Refer to Section 2.4.3.

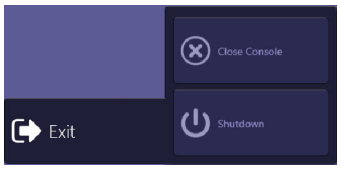
Press on the “Operator Settings” button to display the options related to the operation settings.



MAINTENANCE

Refer to Section 2.4.4.

Press on the “Maintenance” button to access to the equipment maintenance information.



EXIT

(Only available in the Service Mode of the Head-Assembly Console).

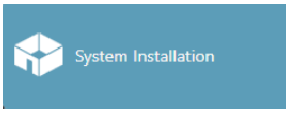
Press on the “Exit” button to close the console or shut down the Unit.

THE “CLOSE CONSOLE” OPTION CLOSES THE CONTROL APPLICATION OF THE HEAD-ASSEMBLY CONSOLE. THIS ACTION DOES NOT INVOLVE A GENERATOR SHUTDOWN, SO UNINTENTIONAL EXPOSURES MAY OCCUR.

THIS BUTTON IS INTENDED ONLY FOR SPECIFIC MAINTENANCE TASKS. AVOID SELECTING THIS OPTION IN ANY OTHER CASE.

Note ☞ *Depending on the license purchased by the client, the setting options contained in these menus may differ from those shown in this manual.*

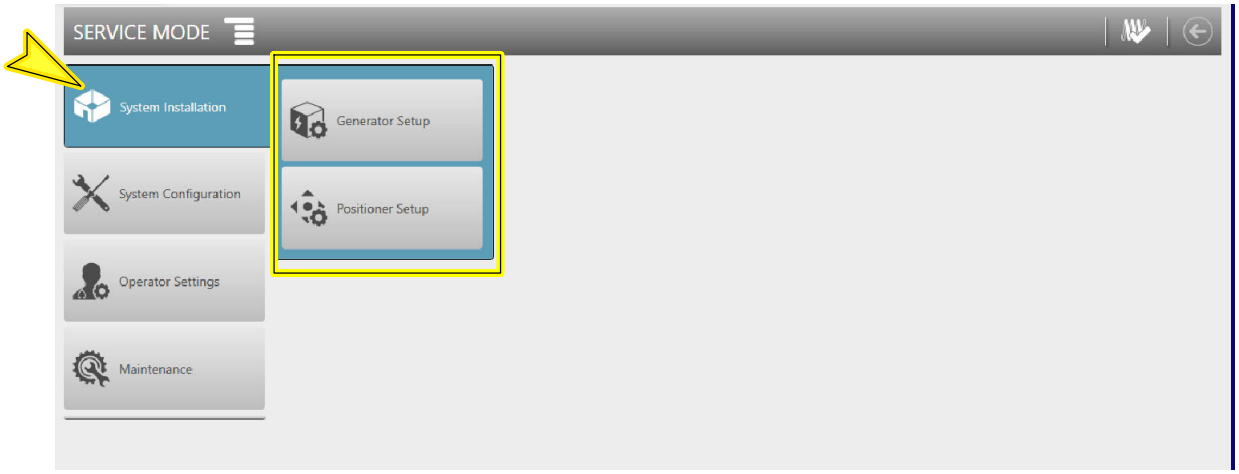
2.4.1 SYSTEM INSTALLATION



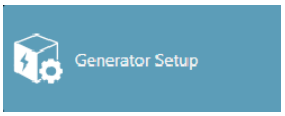
At the Service Mode Main Menu, select System Installation in order to access to the following options:

- Generator Setup"; *refer to section 2.4.1.1.*
- "Positioner Setup"*, refer to section 2.4.1.11.*

Illustration 2-6
Service Mode–System Installation

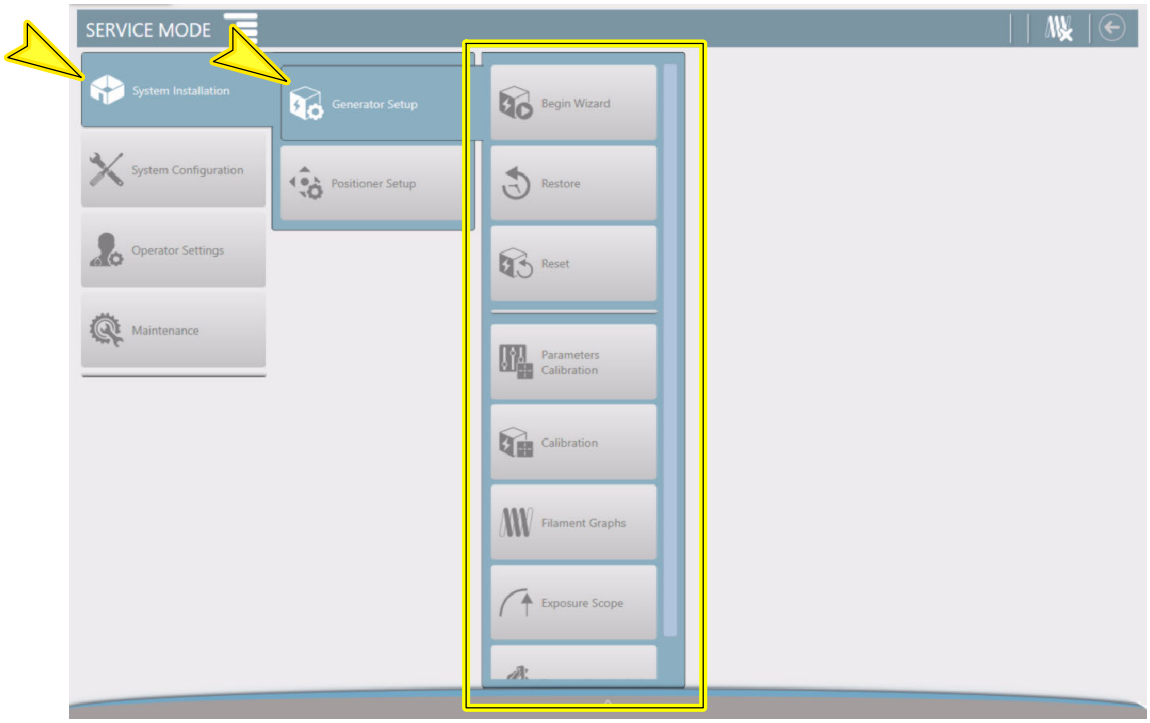


2.4.1.1 GENERATOR SETUP



Select the “Generator Setup” menu to calibrate the X-Ray Generator options.

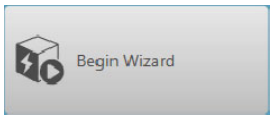
Illustration 2-7
System Installation: Generator Setup



The following options are displayed for Generator Setup menu:

- “Begin Wizard”; *refer to section 2.4.1.2.*
- “Restore”, *refer to section 2.4.1.3.*
- “Reset”, *refer to Section 2.4.1.4.*
- “Parameters Calibration”, *refer to section 2.4.1.5.*
- Calibration:
  - “RAD Manual” (Manual Calibration), *refer to Section 2.4.1.6.*
  - “RAD Auto” (Auto Calibration), *refer to Section 2.4.1.7.*
- “Filament Graphs”, *refer to section 2.4.1.8.*
- “Exposure Scope”, *refer to Section 2.4.1.9.*
- “Remote Handswitch”, *refer to section 2.4.1.10.*

2.4.1.2 BEGIN WIZARD



The “Begin Wizard” is the default option for the Complete Calibration of the system.

Note ☞

All the Generator settings are fully calibrated in factory. There is no need to calibrate them again by using the “Begin Wizard” unless the Advanced Control Board (A3678-XX), the Monoblock Buffer Board (A40003-XX) or the Monoblock itself have been replaced.

For detailed information, refer to the Troubleshooting Chapter of this Service Manual.

Note ☞

When entering the “Begin Wizard” option, system movements are disabled.

If it is needed to adjust the Head-Assembly position for Calibration procedures, return to the Service Mode Main Menu (Status Light Indicator on the Head-Assembly lights red).

The following processes will be displayed consecutively along the Calibration Wizard:

- “Manual Calibration”.
- “kVp Gain”.
- “Low mA Gain”.
- “High mA Gain”.
- “Auto Calibration”.

1. Press on the “Begin Wizard” button and follow the instructions displayed on the screen.

▶ **MANUAL CALIBRATION:**

Note ☞

Manual Calibration has to be performed before the Gains Calibration (in case it is needed and just for the needed mA stations as described in this procedure).

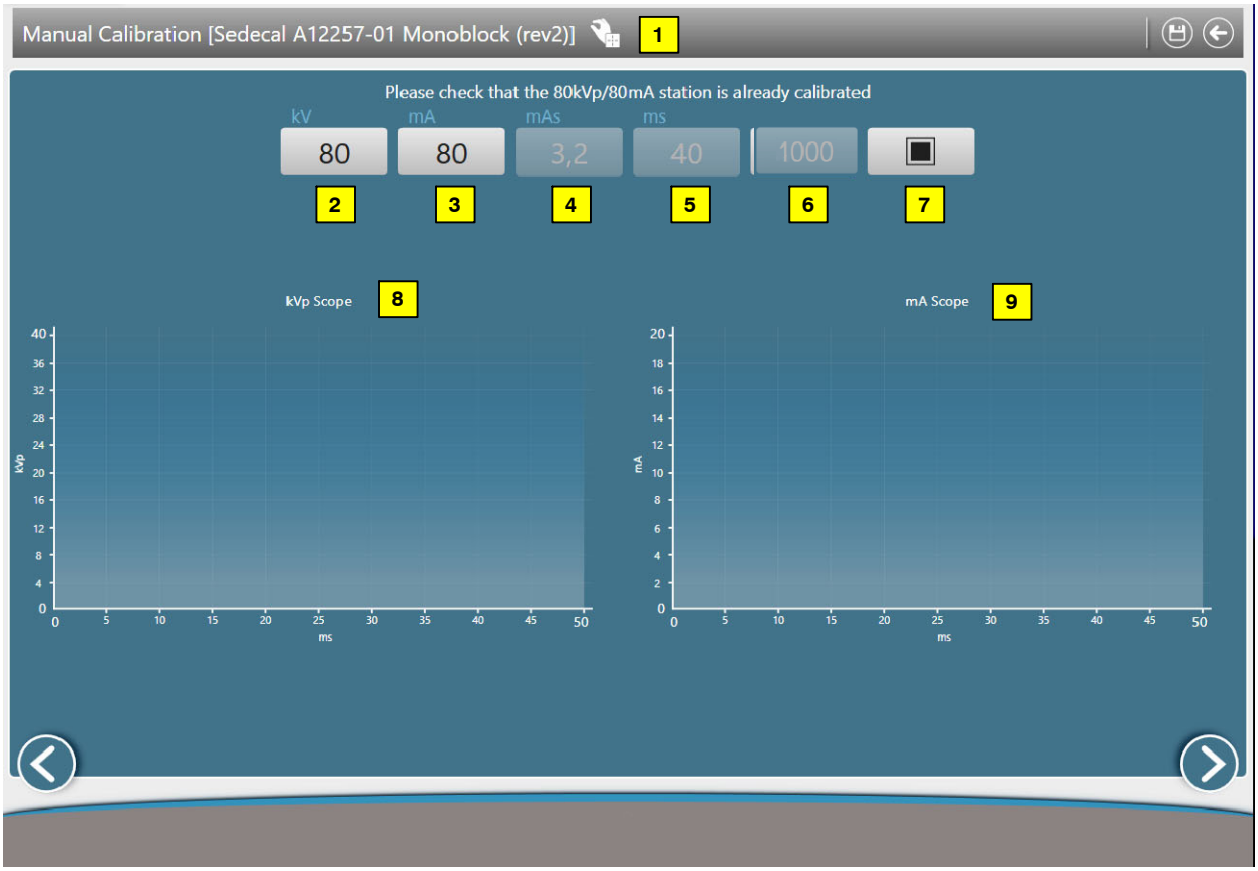
Note ☞ *Use a **mA/mAs meter** to measure mA/mAs; With the System turned OFF, remove the link between TPS1 and TPS2 on the Advanced Control Board A3678-XX, and connect the mA/mAs meter. Then, turn the system ON. Refer to Section 2.3.*

2. Check the installed Tube Insert model in the tittle bar of the “Manual Calibration” screen.

Note ☞ *The name of the installed Tube insert model is shown in the label ”X-ray Tube Assembly” on the Head-Assembly.*

If there is a difference between the installed Tube Insert model and the model displayed in the bar, exit the wizard, and select the correct model in the Positioners Configuration Screen (refer to Section 2.4.2.3) and then, perform the wizard again.

Illustration 2-8
Wizard: Manual Calibration- kV/mA



1. Tube Insert model	4. mAs	7. Focal Spot
2. kV	5. ms	8. kVp scope
3. mA	6. Filament data	9. mA scope

3. Check that the Heat Units displayed on the upper area of the screen are close to 0%.

4. Press on the kV and mA fields and select 80 kVp/80 mA station (Filament Data set to “1000”).

Filament Data (currently in memory) may be or may be not close to your requirements.

If it is not close, the potential exists to damage the X-ray tube (i.e. too much mA).

Thus, when the Filament Data is modified, note how close or how far from the mA break points (maximum available mA in selected kV and Exposure Time) measured mA value is.

When the actual measured mA is too small and it is desired to increase the Filament Data dramatically (more than 40 points), the new Filament Data should be properly estimated in advance so that the actual mA will not exceed the mA break points.

5. Make an exposure while checking the mA/mAs meter.

   The mAs read on the mA/mAs meter must be the same mAs displayed on the Calibration screen with a tolerance of ± 0.1 mAs (tolerance of the parameter and mA/mAs meter).

6. Press on the Filament data field and start increasing it in 100 steps using the slider, making exposures and calculating the mA based on the measured mAs and Exposure Time displayed on the screen until the calculated mA are close to 80 mA.

Illustration 2-9
Wizard: Manual Calibration-Filament Data

7. If the mAs is low, increase the Filament data. If the mAs is high, decrease the filament data.

8. Repeat the procedure until the 80 mA station is calibrated.

9. Prees on the “Store Data” button once the 80kV/80mA station is calibrated.

Note ☞ *Press on the “Store Data” button to store the new data (Filament Current) before proceeding to the next step.*

10. Press on the “Next Step” button to access to the next Calibration screen.

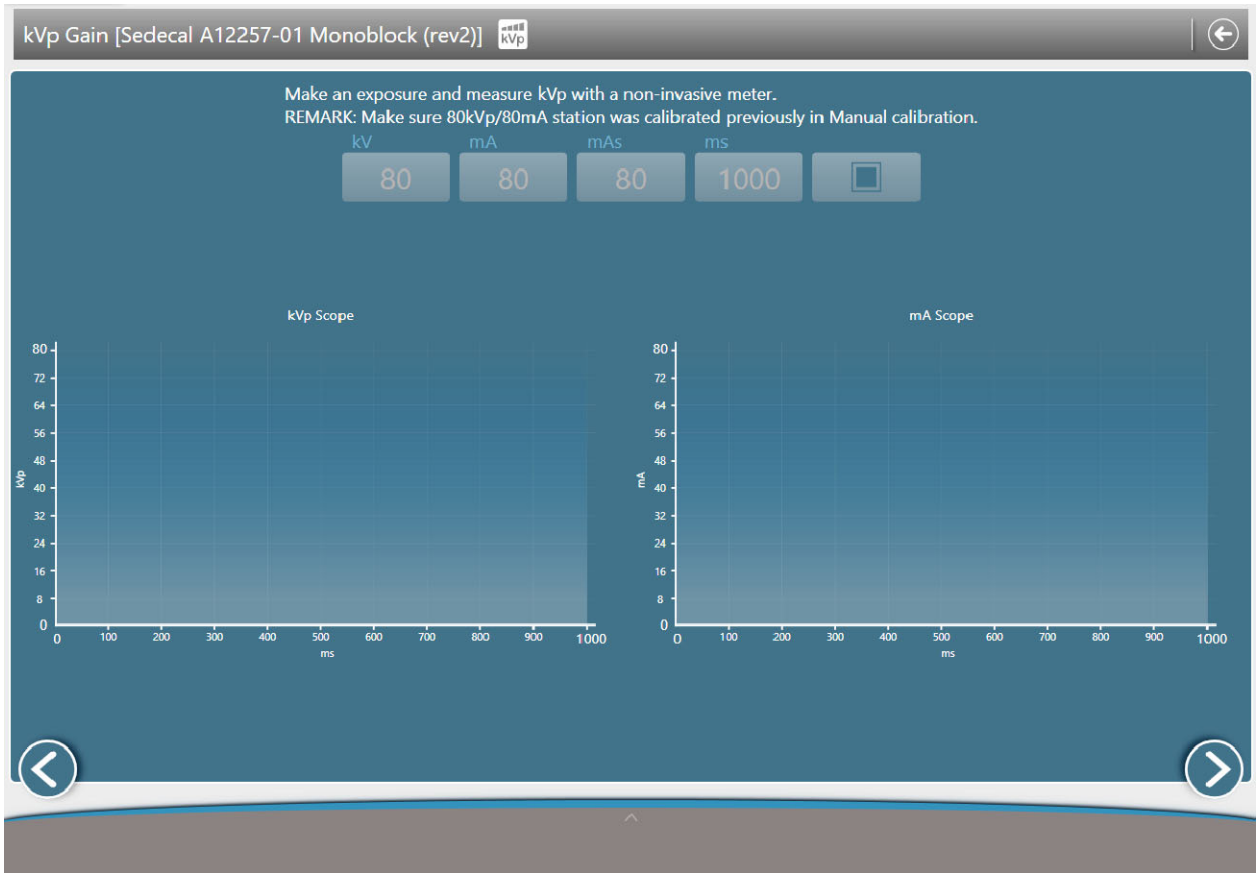
▶ KVP GAIN

Note ☞ *Gains are factory adjusted; there is no need to calibrate them again unless the Advanced Control Board A3678-XX, the Buffer A40003 or the Monoblock have been replaced.*

Note ☞ *Use a **non-invasive kVp meter** to measure kVp; place it under the X-Ray beam aligned with the Collimator light (refer to Section 2.3.).*

Use a well calibrated kVp meter; in case of doubt, Press on the "Back" button to return to the "Generator Setup" menu; select "Parameters Calibration" menu, press on "Summary", touch the "kVp Gain" field, select the value 200 with the slider and press "Store Data".

Illustration 2-10
Wizard: kVp Gain



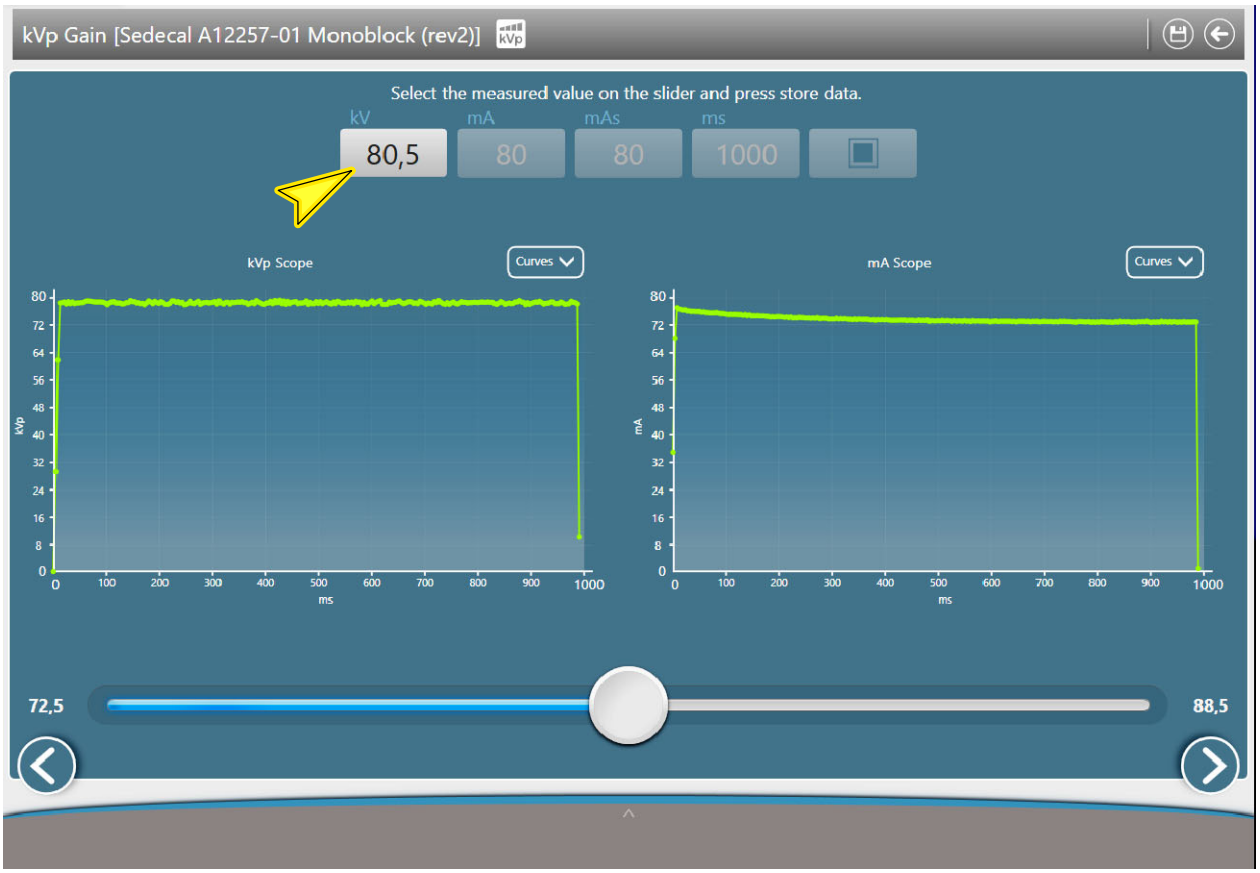
Note ☞ *Gain values have a tolerance of 15%.*
Starting value is 200, so the final value will be within 170 and 230.

11. Make an exposure.

12. Check the kVp value displayed in the non-invasive kVp meter.

13. Press on the kV field and enter the measured value in the non-invasive kVp meter, by using the slider.

Illustration 2-11
Wizard: kVp Gain-kV adjustment



14. Press on the “Store Data” button.

15. kVp is then adjusted and the “kVp Gain” value is automatically modified.

Illustration 2-12
Wizard: kVp Gain adjusted

16. Press on the “Next Step” button to access to the next Calibration screen.

▶ **LOW mA GAIN**

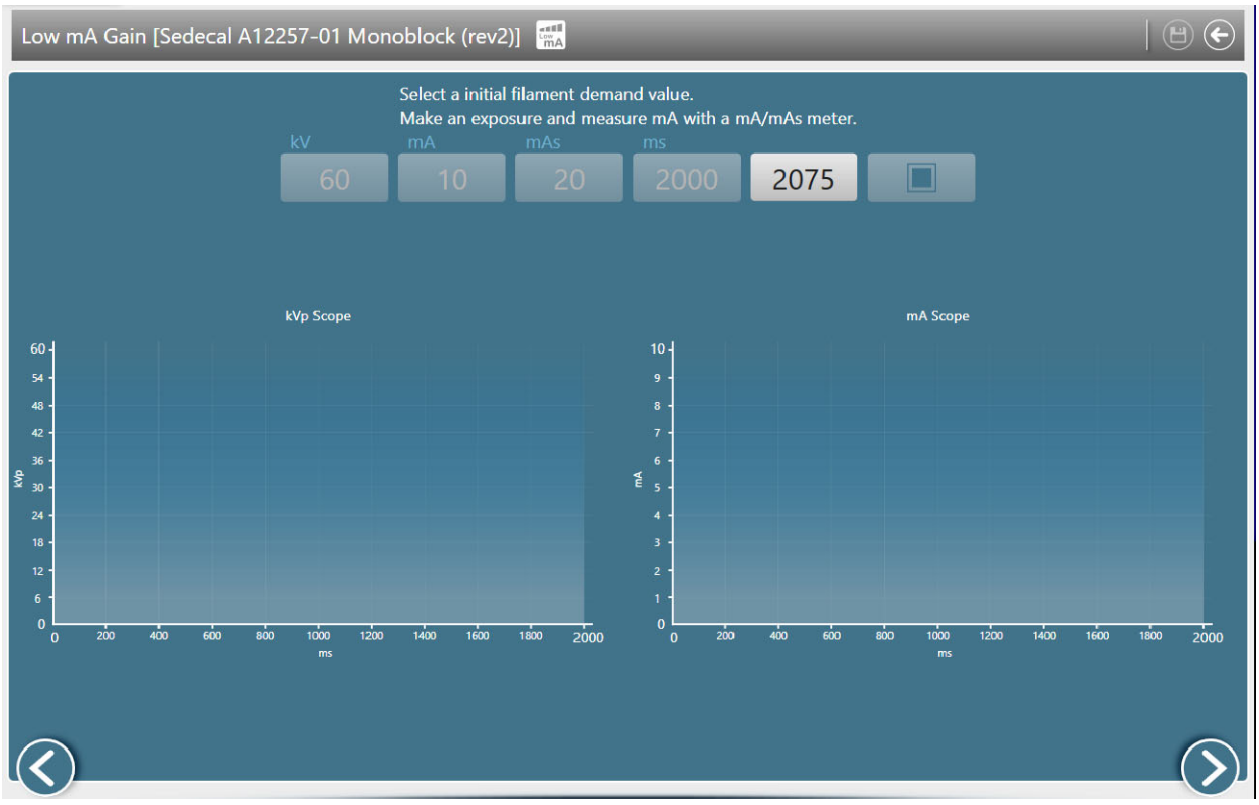
Note ☞ *Low mA scale: 10mA-80mA.*

Note ☞ *Check that the **mA/mAs meter** is connected to TPS1 and TPS2 on the Advanced Control Board A3678-XX. Refer to Section 2.3.*

Note ☞ *All the Generator settings are fully calibrated in factory. There is no need to calibrate them again by using the "Begin Wizard" unless the Advanced Control Board (A3678-XX), the Monoblock Buffer Board (A40003-XX) or the Monoblock itself have been replaced.*

For detailed information, refer to the Troubleshooting Chapter of this Service Manual.

Illustration 2-13
Wizard: Low mA Gain



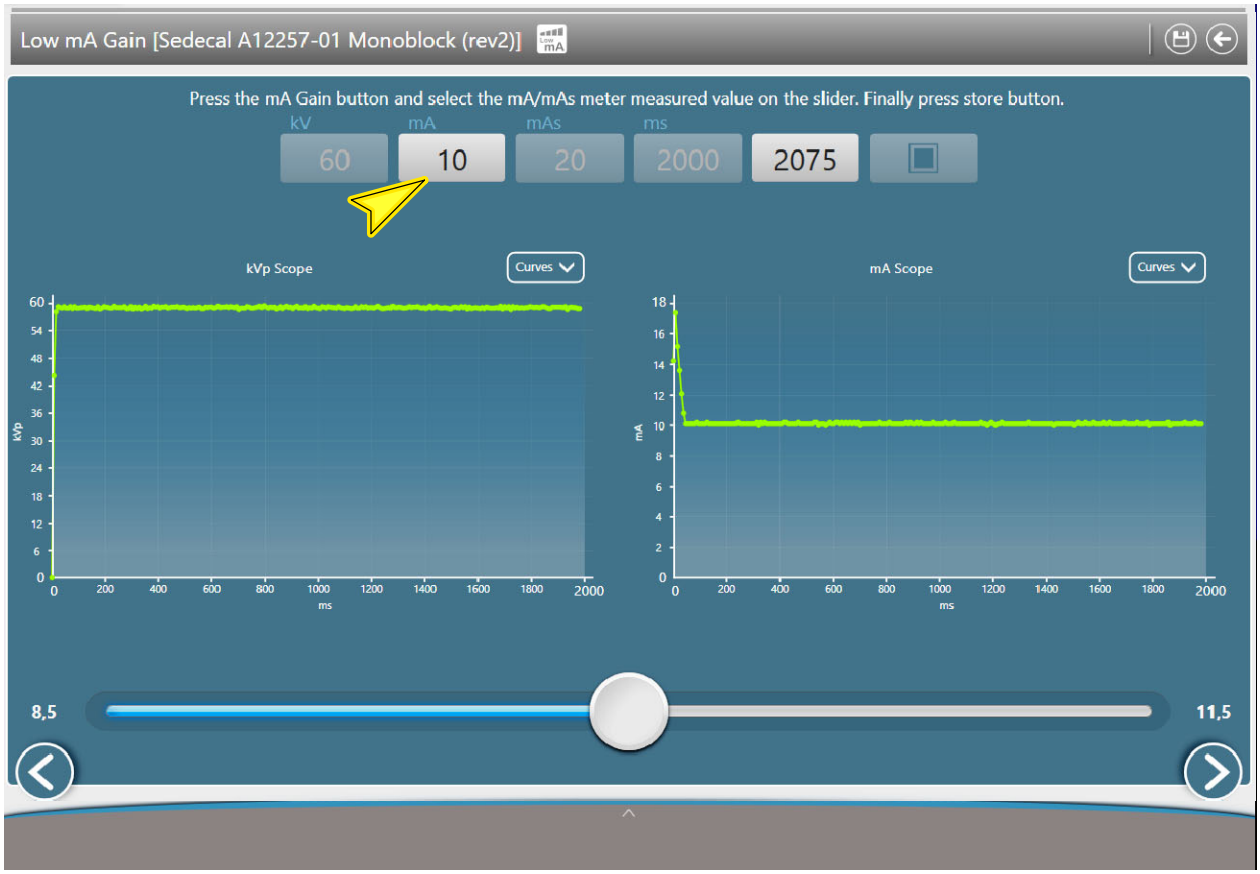
Note ☞ *Do not modify the value displayed on the Filament data field.*

17. Verify that the mA/mAs meter is in mA mode and adjust the scale to measure a value of 10 mA approximately.

18. Make an exposure while checking the measured mA in the mA/mAs meter.

19. If the value is correct, the mA field is enabled. Continue as indicated in the *step 20.*

Illustration 2-14
Wizard: Low mA Gain-mA field enabled



Note ☞

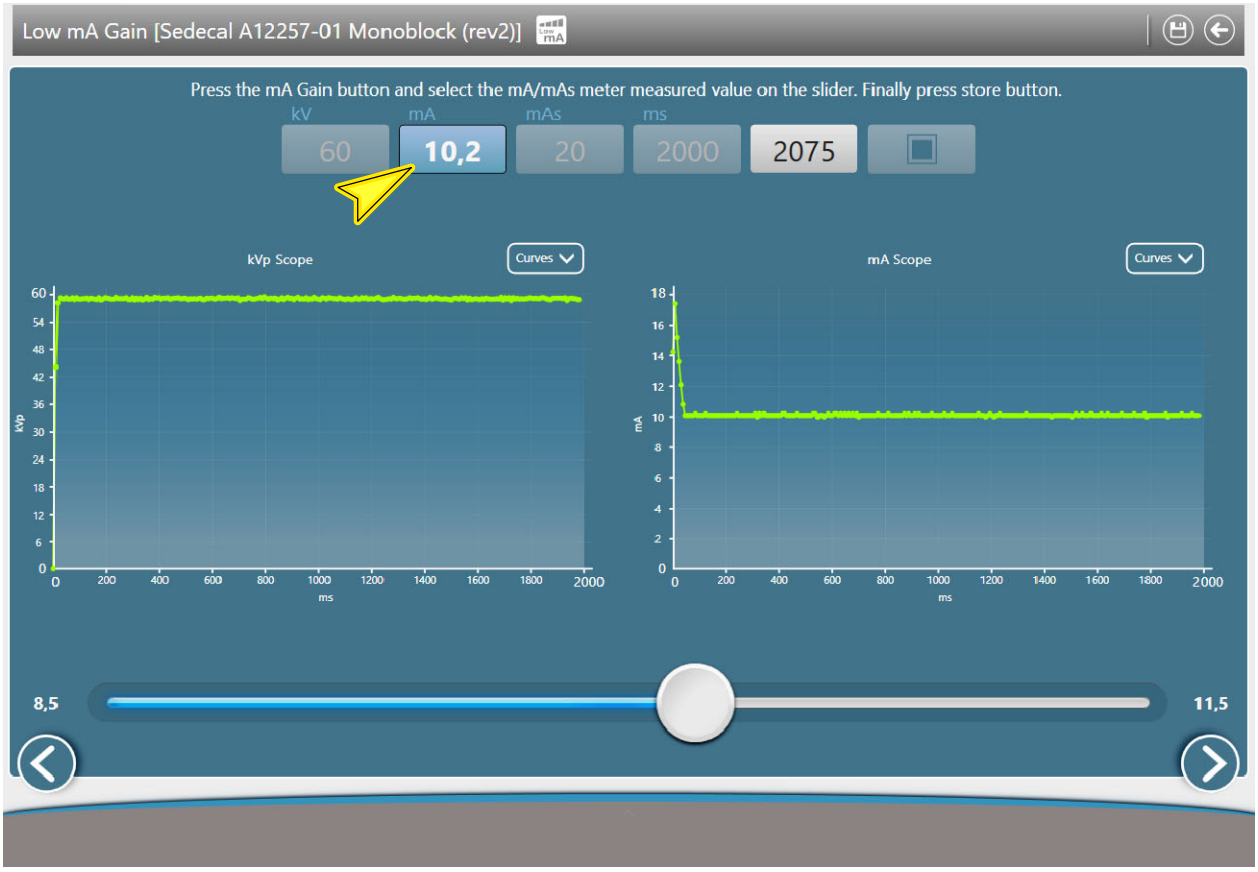
If the value is not correct, the mA field remains disabled, a message is displayed to inform that the exposure is out of the limit allowed and the Filament demand value has been adjusted automatically.

Verify that the Filament value has automatically changed ±100 units and repeat the Low mA Gain procedure from step 18.

Illustration 2-15
Wizard: Low mA Gain: Exposure out of limit - Filament demand value adjusted

20. Press on the mA field, enter the measured mA value in the mA/mAs meter by using the slider.

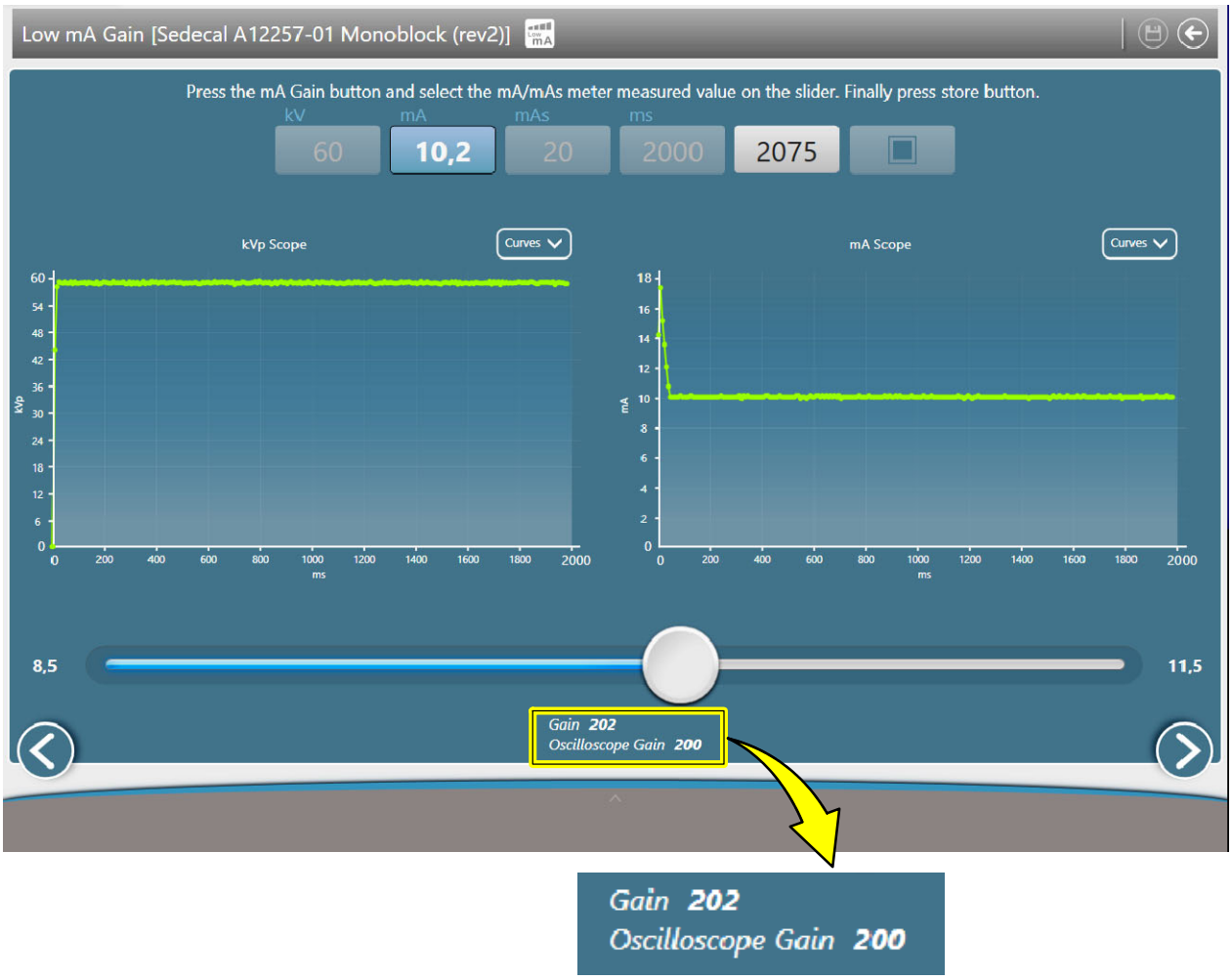
Illustration 2-16
Wizard: Low mA Gain-mA adjustment



21. Press on “Store Data”.

Low mA is then adjusted and the gain value is automatically modified.

Illustration 2-17
Wizard: Low mA Gain adjusted



Note ☞ *The final Gain value will be within 170 and 230.*

22. Press on the “Next Step” button to access to the next Calibration screen.

▶ HIGH MA GAIN

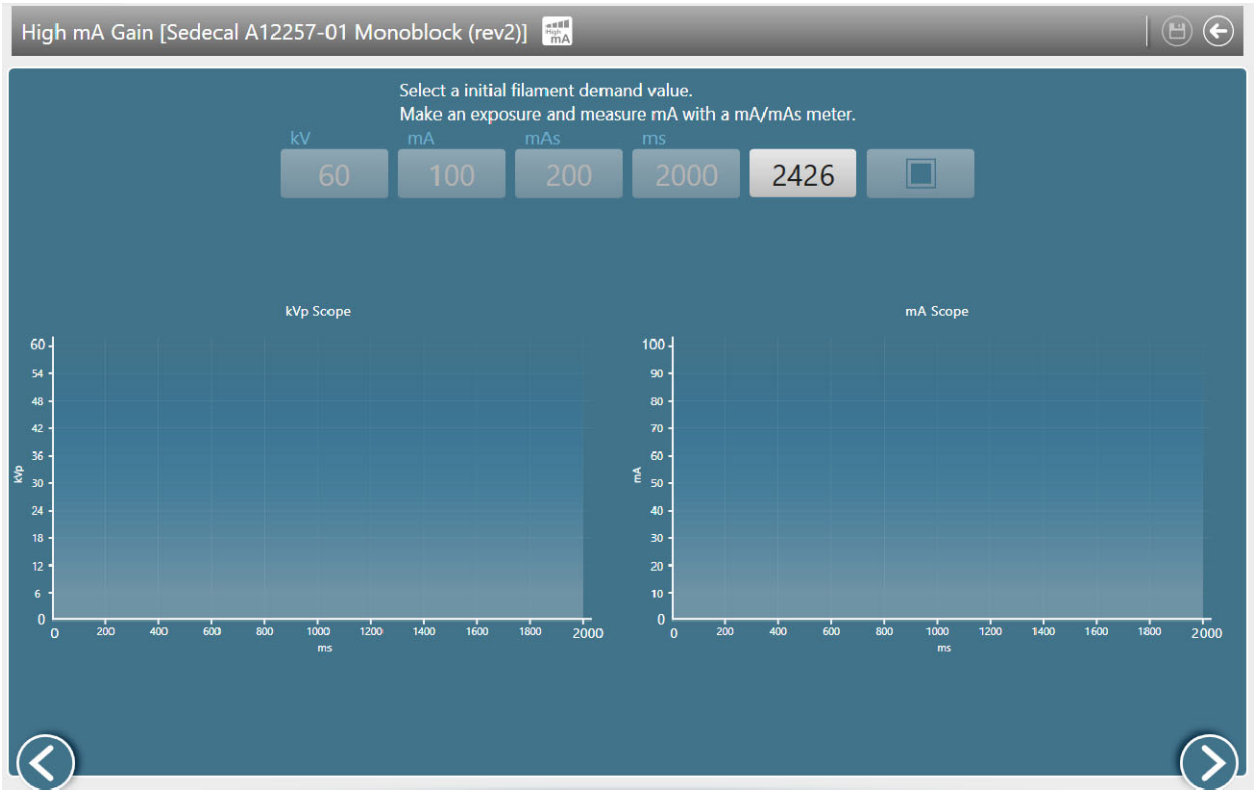
Note ☞ *High mA scale: from 100mA to the maximum available.*

Note ☞ *Check that the **mA/mAs meter** is connected to TPS1 and TPS2 on the Advanced Control Board A3678-XX. Refer to Section 2.3.*

Note ☞ *All the Generator settings are fully calibrated in factory. There is no need to calibrate them again by using the "Begin Wizard" unless the Advanced Control Board (A3678-XX), the Monoblock Buffer Board (A40003-XX) or the Monoblock itself have been replaced.*

For detailed information, refer to the Troubleshooting Chapter of this Service Manual.

Illustration 2-18
Wizard: High mA Gain



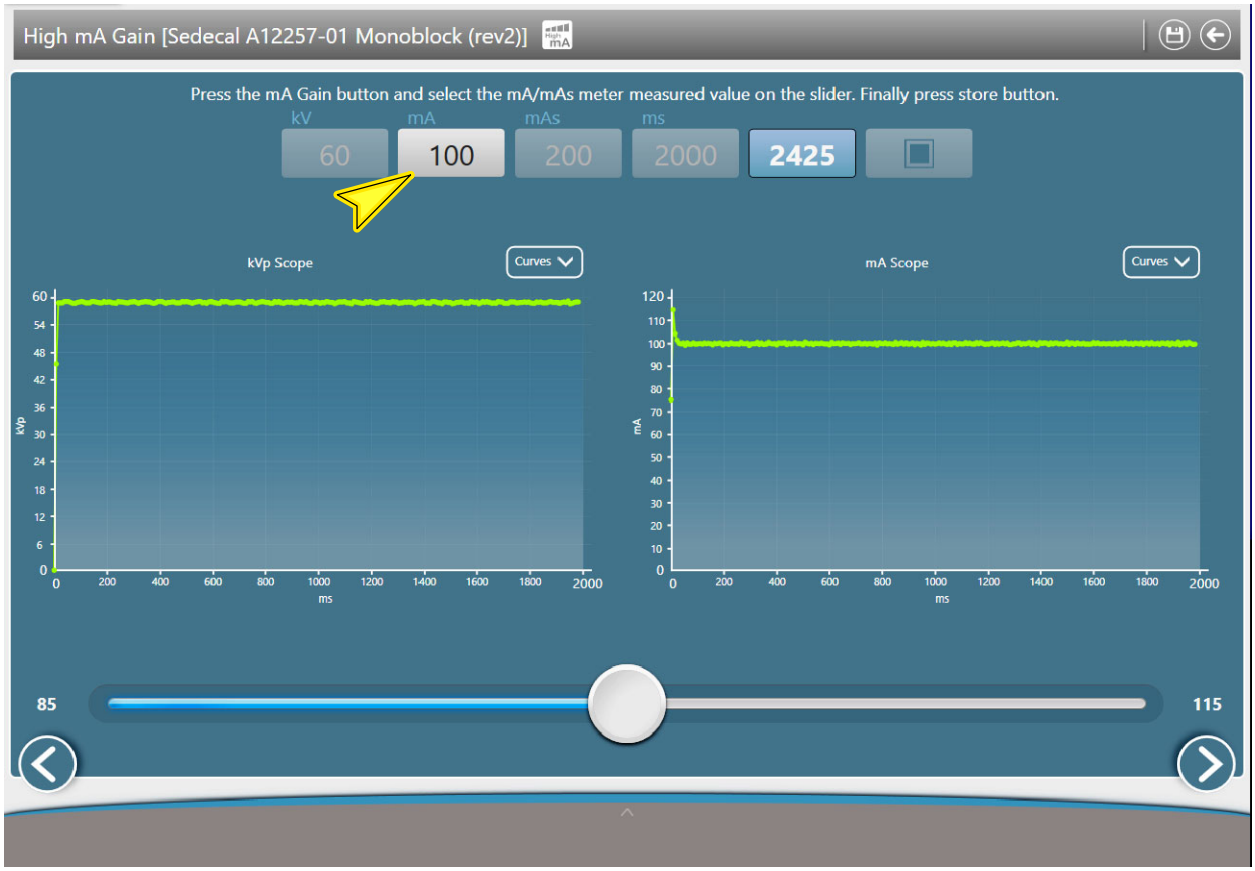
Note ☞ *Do not modify the value displayed on the Filament data field.*

23. Verify that the mA/mAs meter is in mA mode and adjust the scale to measure a value of 100 mA approximately.

24. Make an exposure while checking the measured mA in the mA/mAs meter.

25. If the value is correct, the mA field is enabled. Continue as indicated in the *step 26.*

Illustration 2-19
Wizard: High mA Gain–mA field enabled

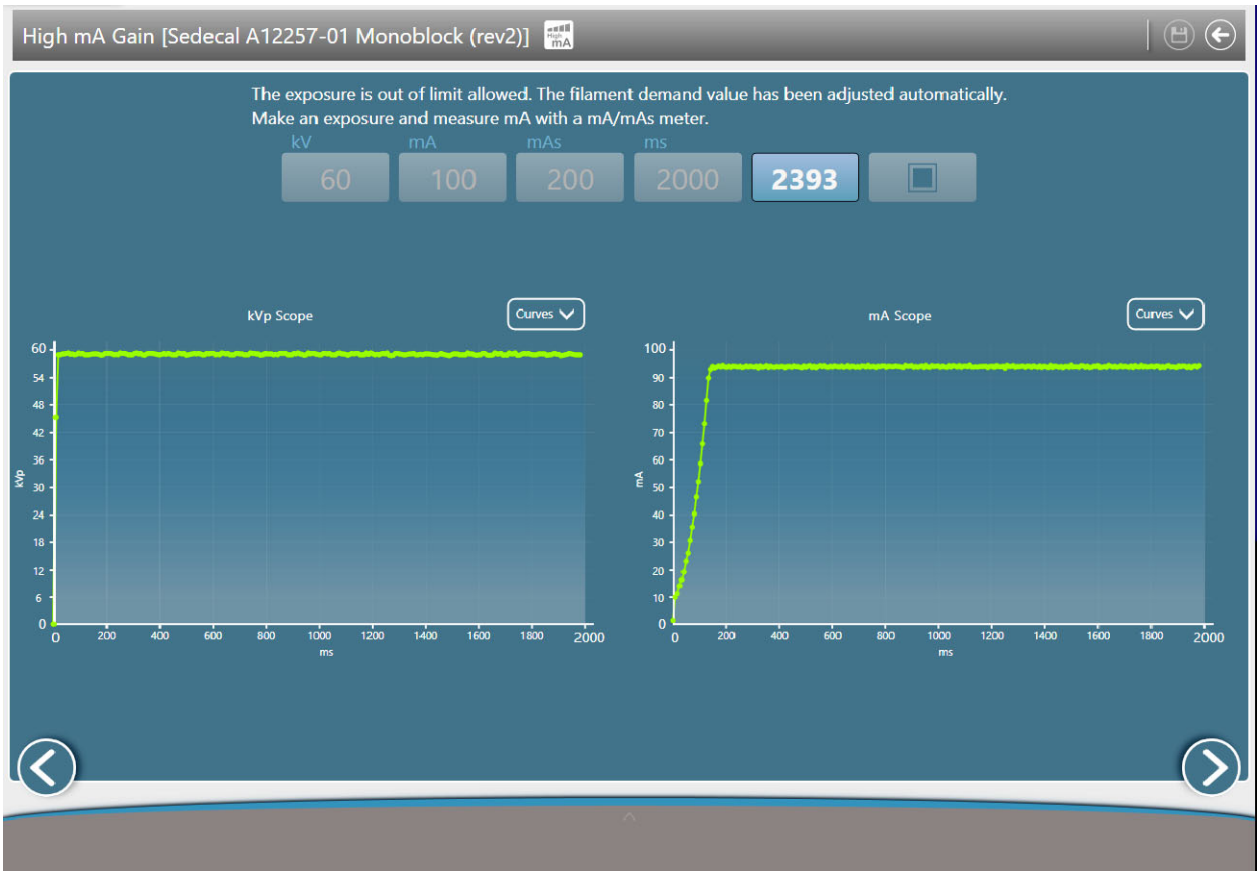


Note ☞

If the value is not correct, the mA field remains disabled, a message is displayed to inform that the exposure is out of the limit allowed and the Filament demand value has been adjusted automatically.

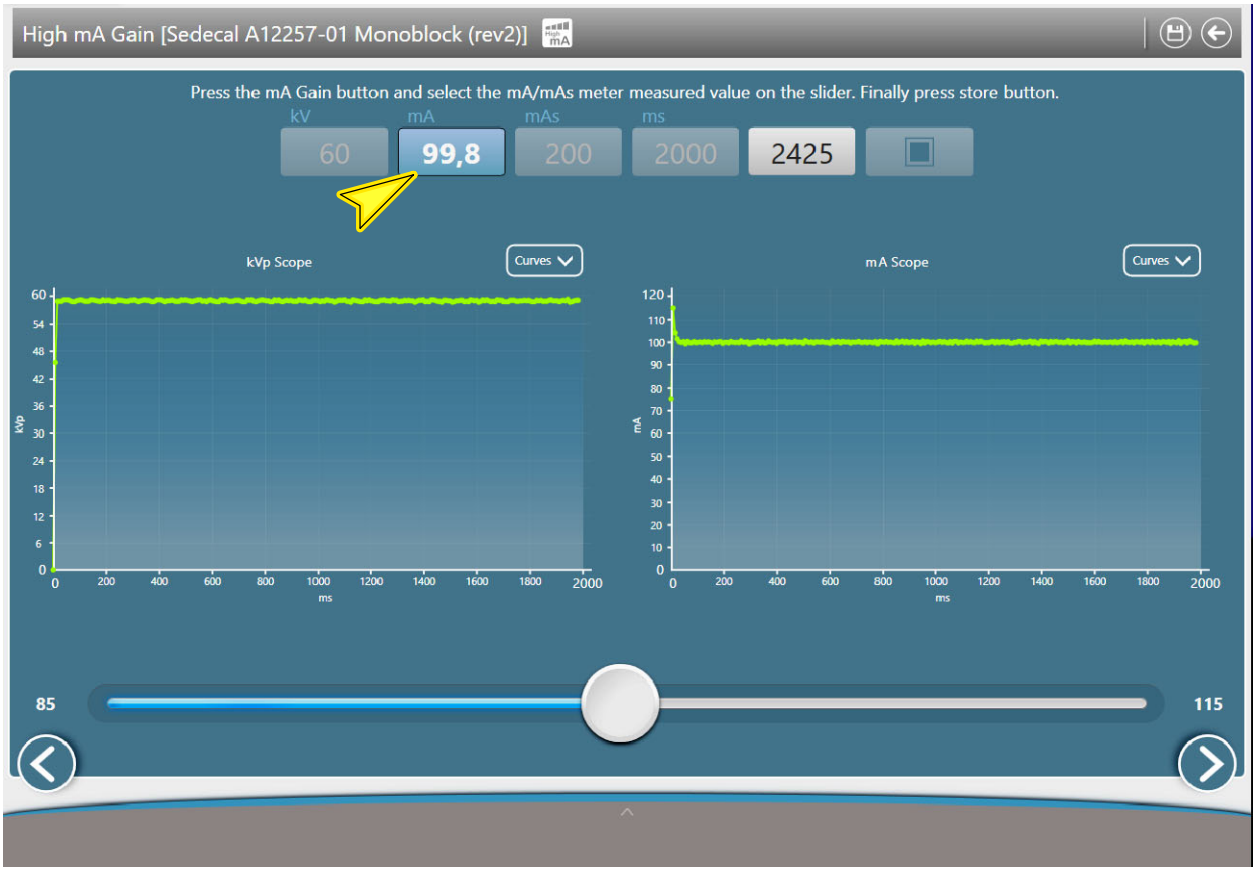
Verify that the Filament value has automatically changed ±100 units and repeat the Low mA Gain procedure from step 24.

Illustration 2-20
Wizard: High mA Gain-Exposure out of limit-Filament demand value adjusted



26. Press on the mA field, enter the measured mA value in the mA/mAs meter by using the slider.

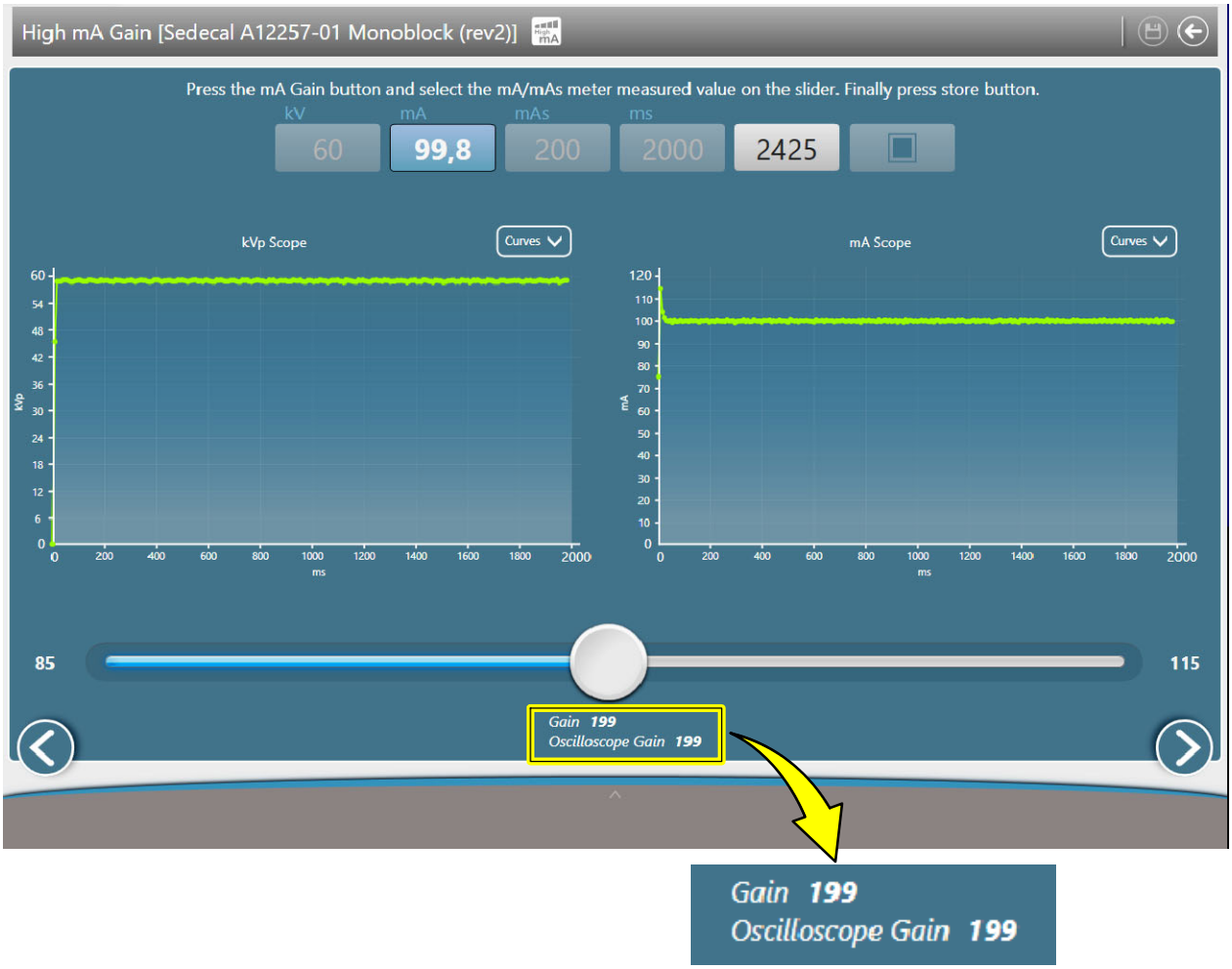
Illustration 2-21
Wizard: High mA Gain–mA adjustment



27. Press on“Store Data”.

High mA is then adjusted and the gain value is automatically modified.

Illustration 2-22
Wizard: High mA Gain adjusted



Note ☞ *The final Gain value will be within 170 and 230.*

28. Press on the “Next Step” button to access to the next Calibration screen.

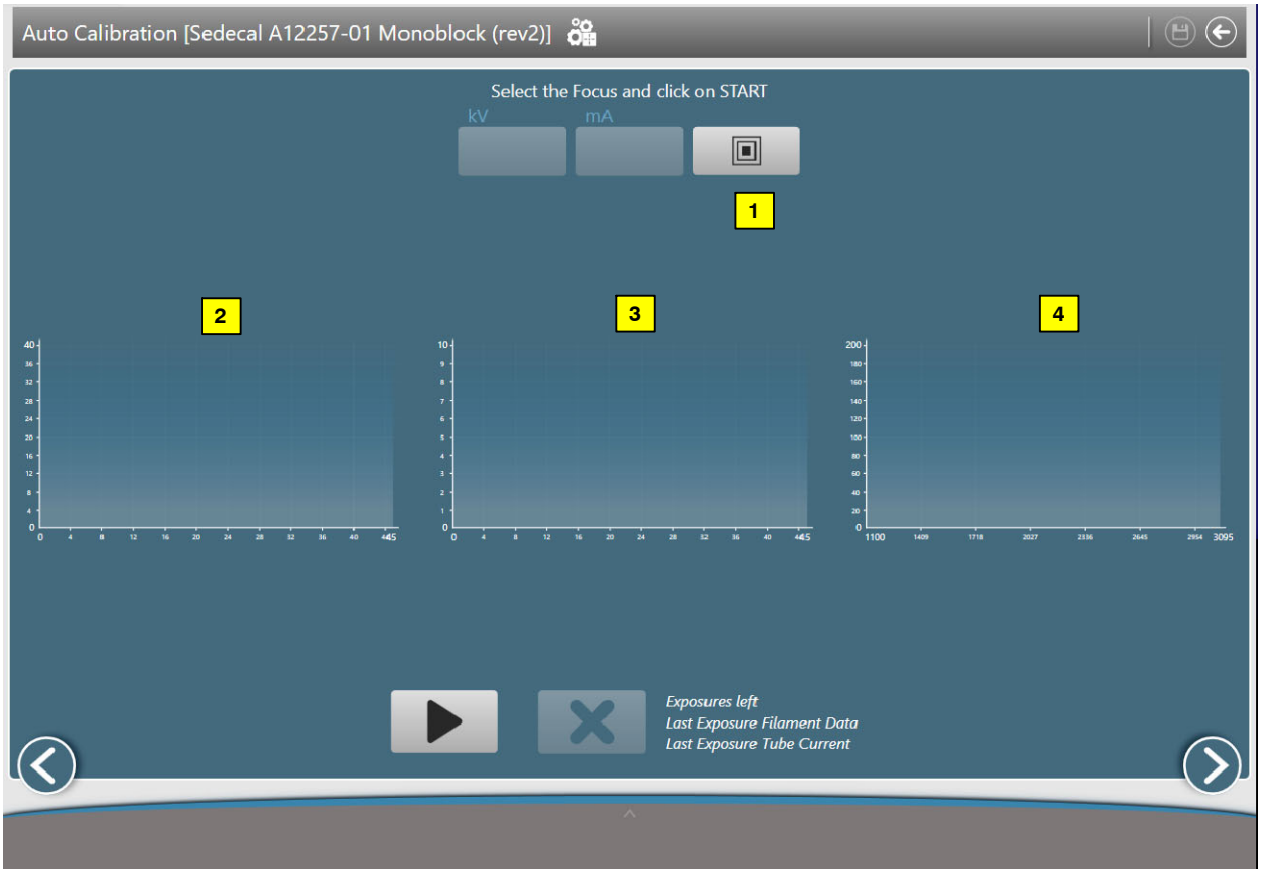
▶ AUTO CALIBRATION

Note ☞ *In Auto Calibration mode, all technique parameters are factory pre-programmed and they cannot be changed.*

Auto Calibration of the Filament Current data is divided in two procedures related to the mA stations configured for the Small or Large Focal Spots. It is recommended to start with the Small Focal Spot and continue with the Large Focal Spot.

During Auto Calibration, kVp and mA are shown in their corresponding fields every time an exposure is made.

Illustration 2-23
Wizard: Auto Calibration



1. Focal Spot
2. kVp scope
3. mA scope
4. Filament scope

Note ☞ *Press on the “Cancel Calibration” button to leave without losing any data previously stored.*

This can be made even if the Auto Calibration procedure has been started, as long as the “Store Data” button is not pressed.

Note ☞ *To exit Auto Calibration without calibrating every station, release the handswitch and press “Store Data” after completing the last needed station. Previously stored values will be deleted and replaced by the values calibrated so far.*

Non-calibrated values have to be calibrated manually.

Refer to Section 2.4.1.6.

Note ☞ *If any error occurs during the Auto Calibration process or the Auto Calibration process ends before the whole procedure is completed, perform the manual Calibration of the remaining kV/mA combinations.*

Refer to Section 2.4.1.6.

Note ☞ *Auto Calibration can be paused momentarily releasing the Handswitch button, whenever there is not an exposure in process.*

Press the Handswitch again to resume the Auto Calibration.

29. Check that the Heat Units used by the X-ray Tube are 0% or nearly so.

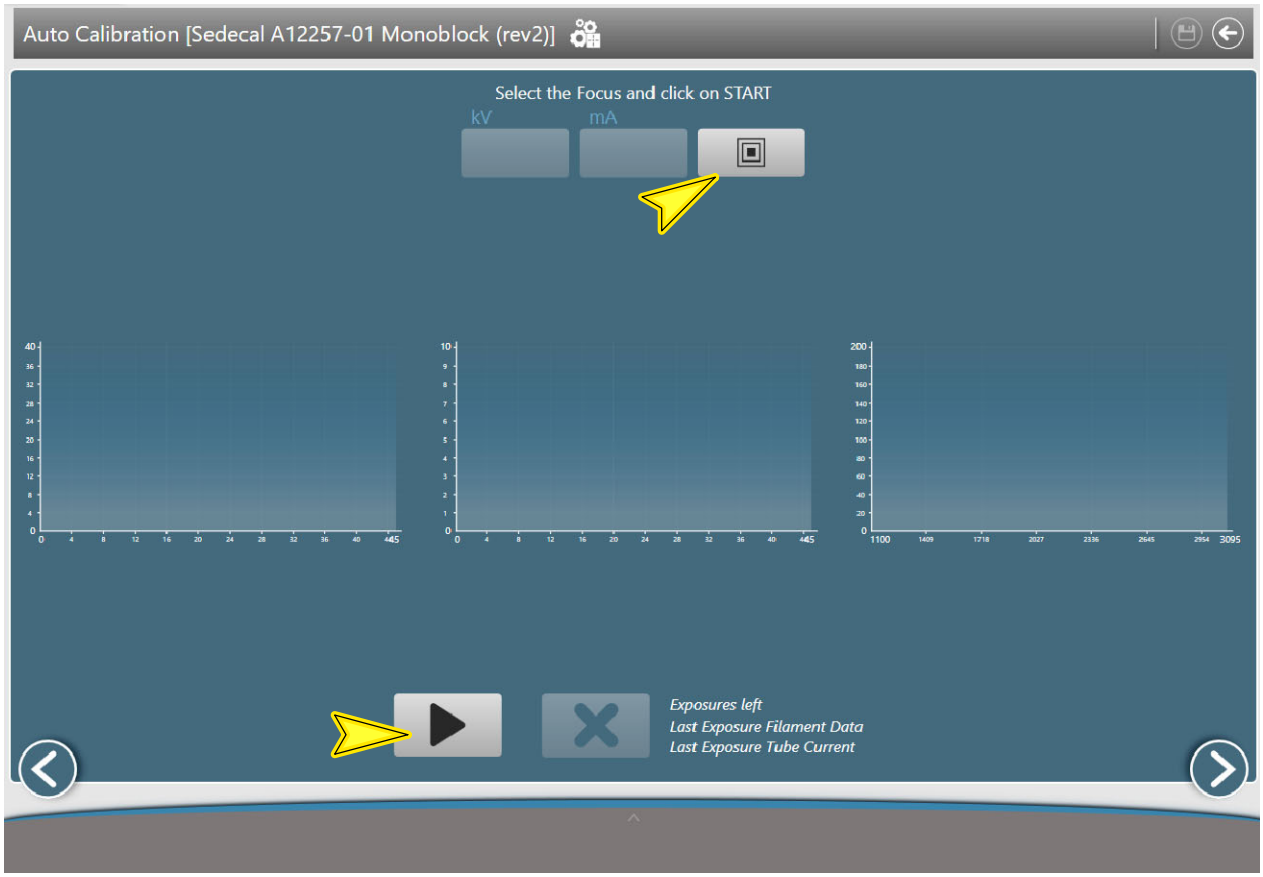
30. Select a Focal Spot.

Note ☞ *Select any of the Focal Spots to perform the Auto Calibration procedure.*

It can be started with Small Focus and then, repeated with Large Focus, although it is not required to do both Focus.

31. Press on the “Start” button.

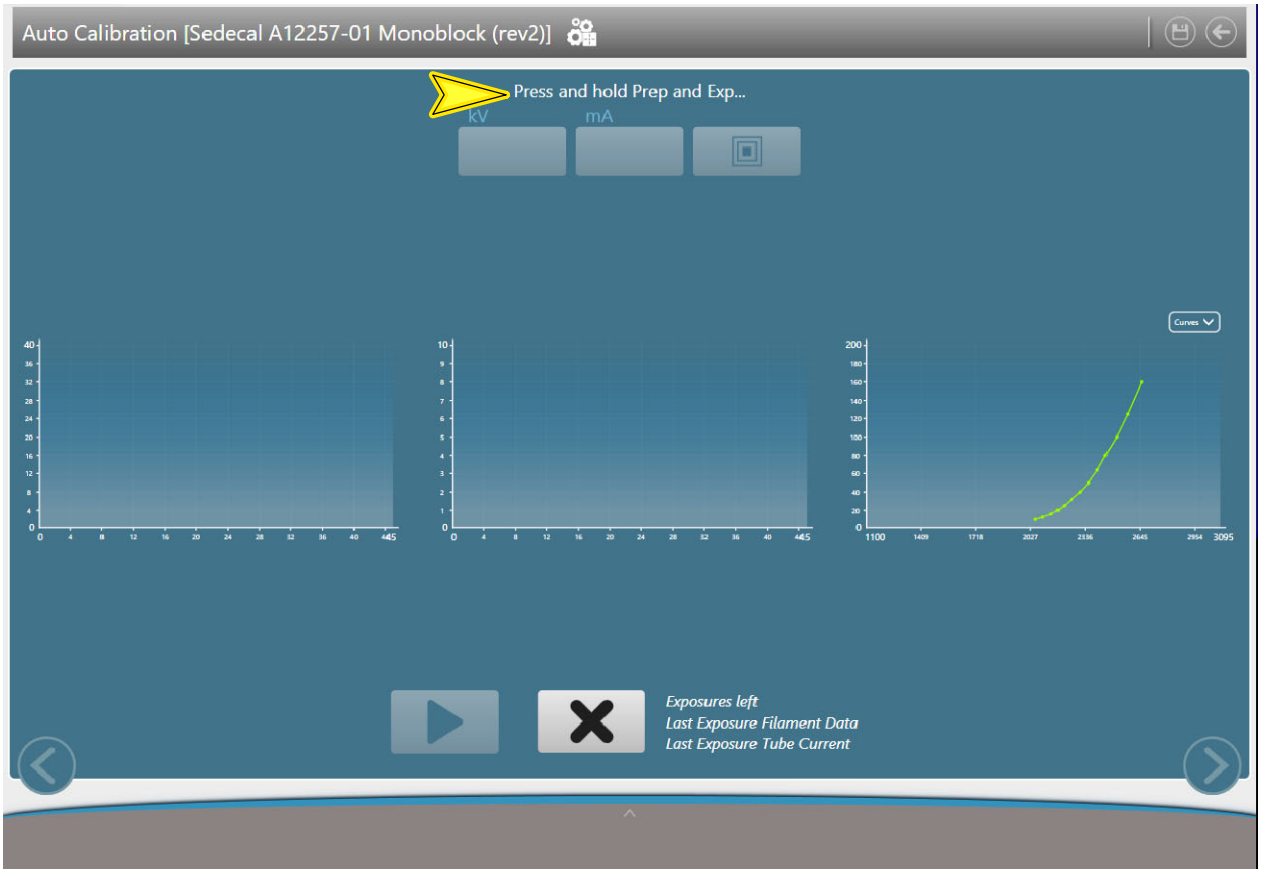
Illustration 2-24
Wizard: Auto Calibration–Select Focus (Small Focal Spot) and Start



32. Fully press and hold the Handswitch button “Prep” and “Exp” in order to perform continuous exposures.

The “Ready” icon lighs green and the “Exposure” icon lights yellow every time an exposure is made. The Status Light Indicator on the Head-Assembly will light successively green for ready status, and yellow every time an exposure is made.

Illustration 2-25
Wizard: Auto Calibration–Press and hold Prep and Exp



Auto Calibration starts with a series of exposures, increasing the Filament data in 100 steps until reaching half of the mA of the first station to be calibrated.

Then, Auto Calibration of the first kVp/mA station begins with the minimum available mA station for the selected Focal Spot at the minimum kVp and follows with all the other combinations of mA stations for the selected Focal Spot at Low, Medium and High kVp.

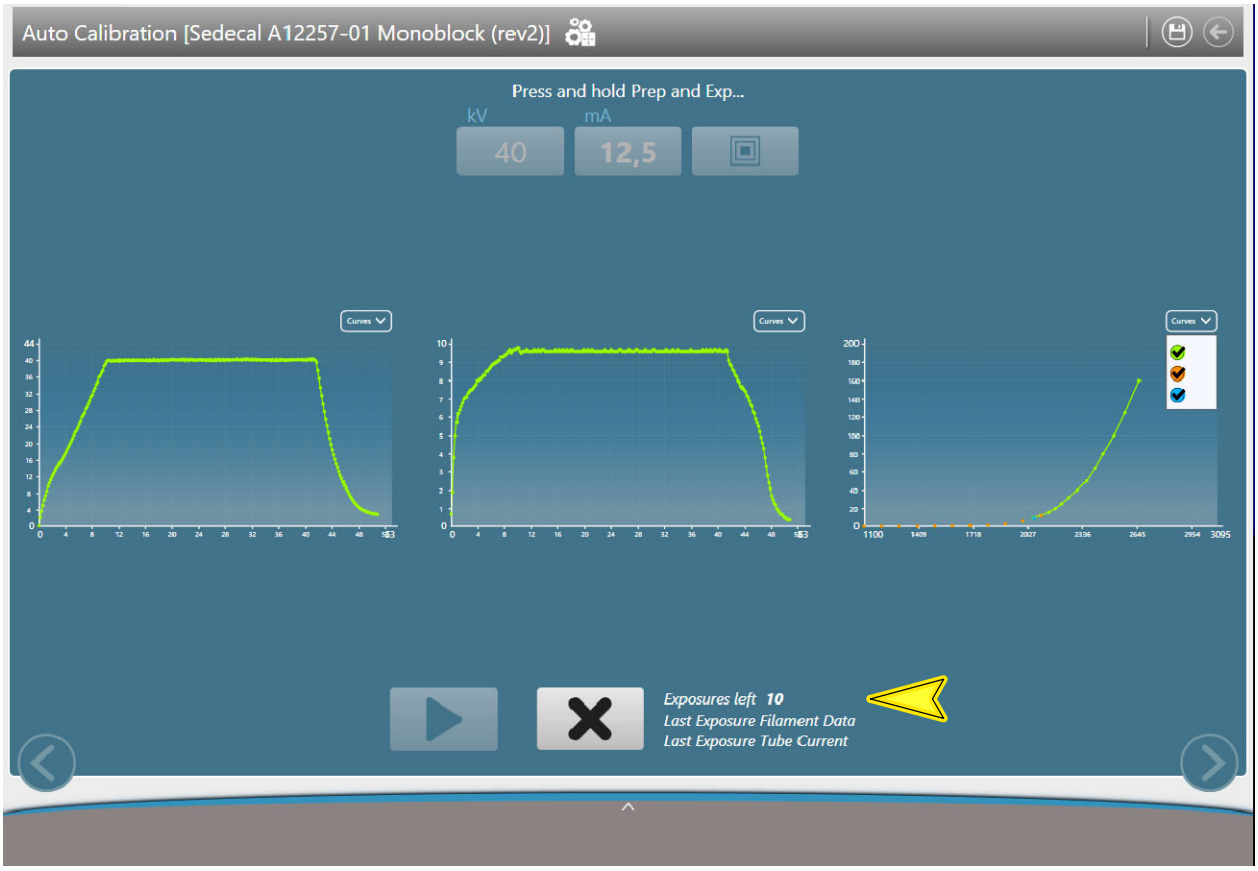
Note ☞

Generator tries to calibrate each kV/mA combination in ten (10) attempts (maximum).

If it is not possible to calibrate the current mA station in ten attempts, an error will be shown on the screen. Reset the error condition and continue with the Auto Calibration procedure.

Information about number of Exposures left, Last Exposure Filament Data and Last Exposure Tube Current is displayed on the lower area of the screen.

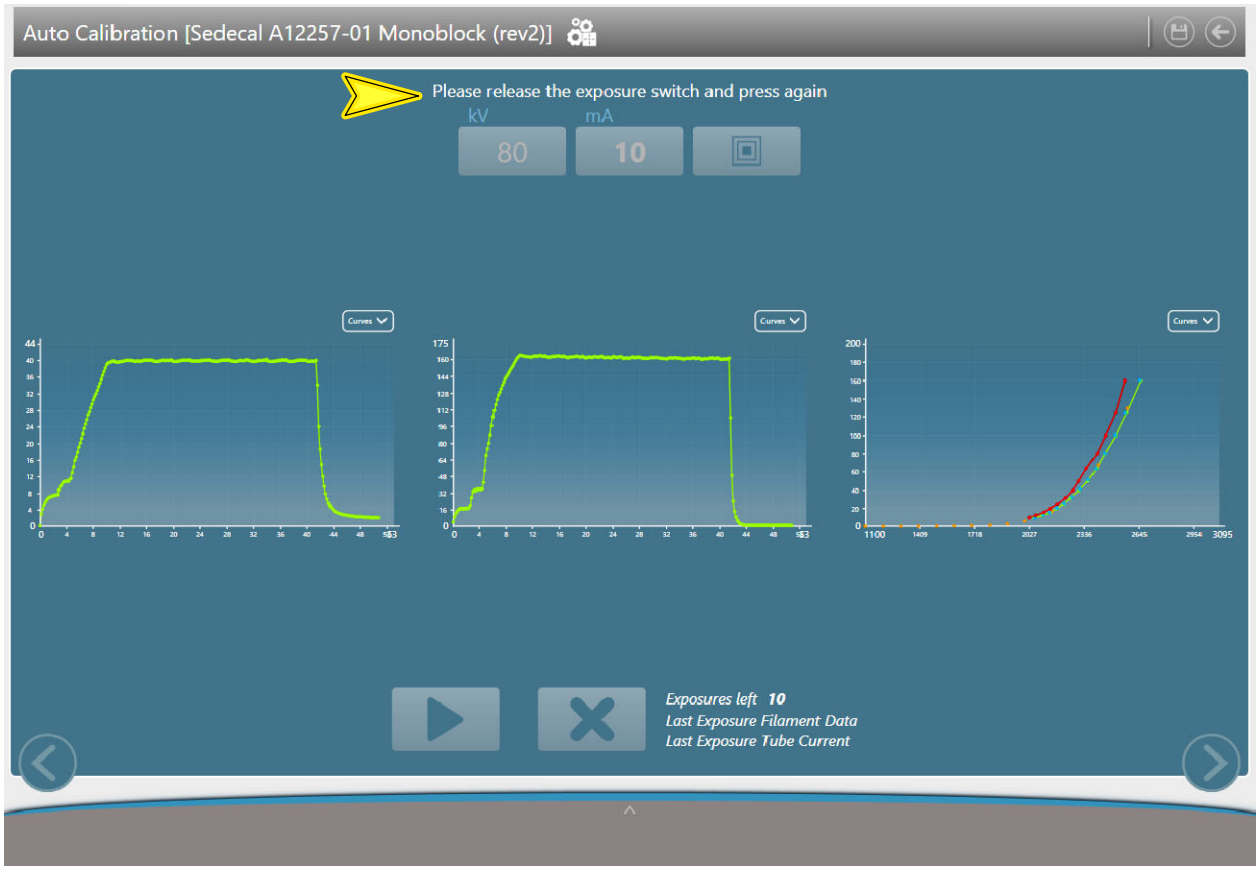
Illustration 2-26
Wizard: Auto Calibration–Information area



33. Auto Calibration process is paused after every kVp station, then it is mandatory to release the Handswitch; a message on the upper area of the screen is prompting the user to do so.

Note ☞ *The system does not allow to make exposures in order to prevent Filament overheat when many stations are to be calibrated. In this case, a message appears on the screen prompting the user to release the handswitch for quite a while to let the Tube to cool down (check the HU indicator).*

Illustration 2-27
Wizard: Auto Calibration-Release the exposure switch and press again



34. Fully press and hold the Handswitch again in order to continue with the Calibration process.

Illustration 2-28
Wizard: Auto Calibration-Graphics and Curves

Note ☞

The Auto Calibration procedure screen shows 3 graphics, representing the curves for kV, mA and the Current Focus Filament under Calibration (Focal Spot).

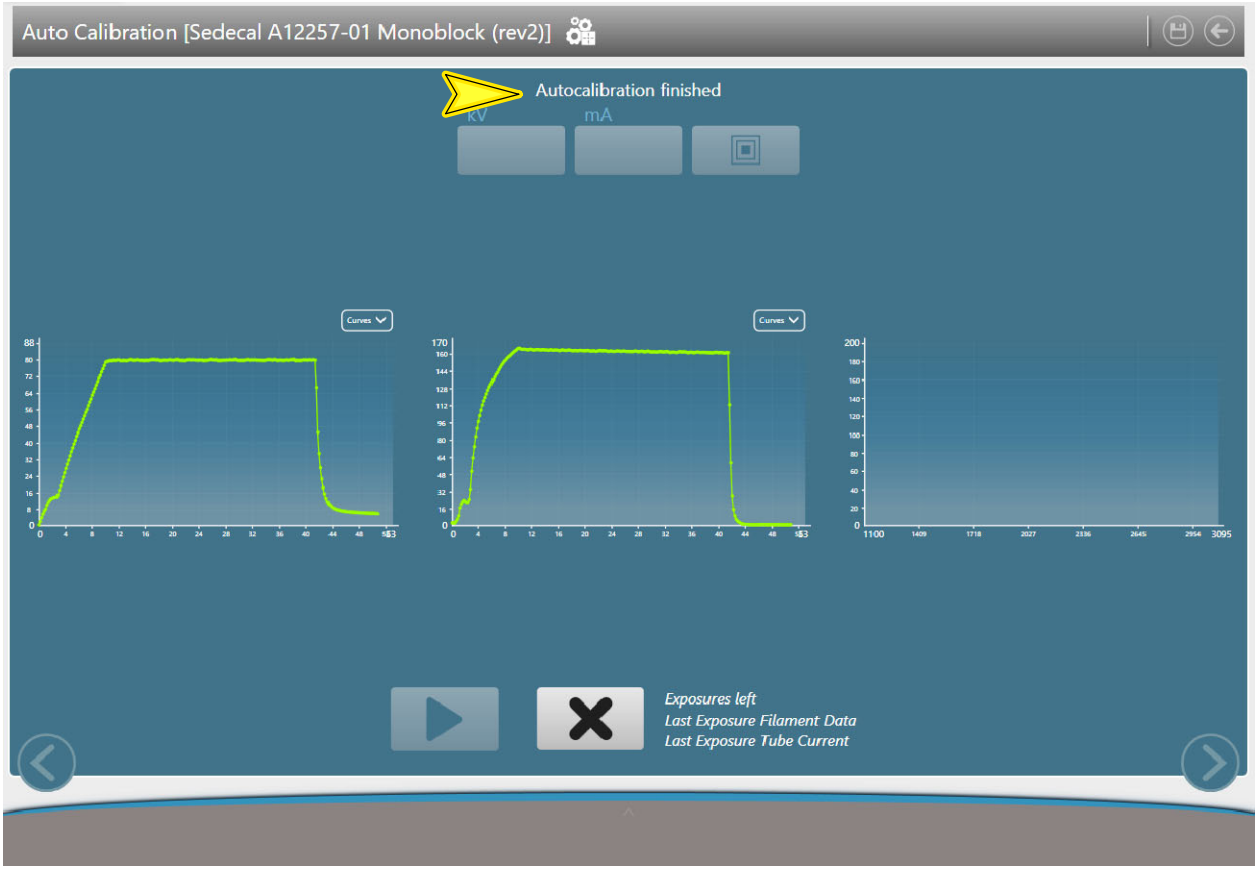
Press on any of the Curves field for further information.

Press on the Filament Curves field, the colors indicate:

- *Green: low kVp Curve (40kVp).*
- *Red: medium kVp Curve (80kVp).*
- *Yellow: high kVp Curve (120kVp).*
- *When the system performs a series of continuous exposures, the Orange spots indicate every exposure performed and Blue spots indicate the system adjustment for every Calibration point.*

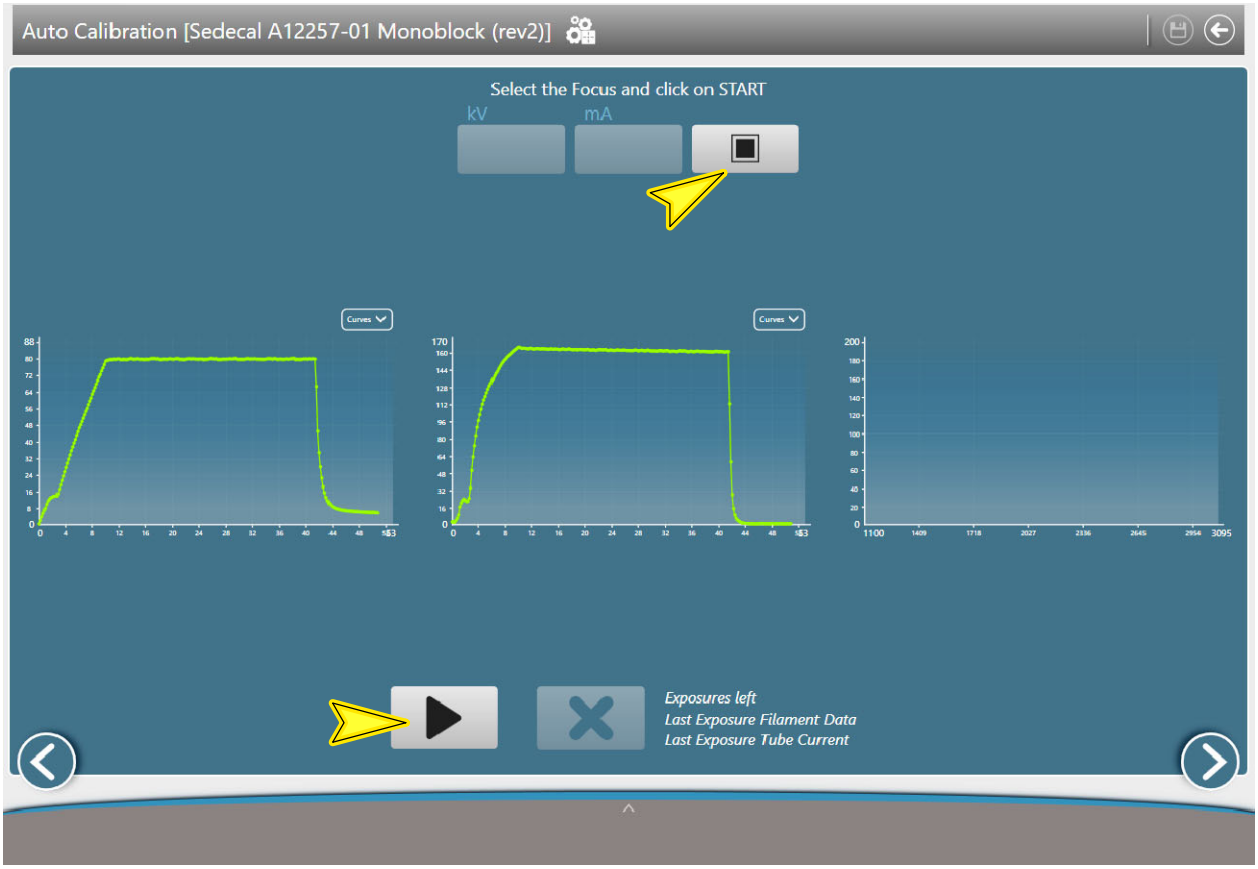
35. When Auto Calibration ends successfully, the message “Auto Calibration Finished” is displayed on the screen.

Illustration 2-29
Wizard: Auto Calibration Finished



36. Press on the “Cancel” button to go back and change the Focal Spot if necessary; then, press the “Start” button to continue with the other Focal Spot Calibration procedure, repeating from step 31. to the end.

Illustration 2-30
Wizard: Auto Calibration (Large Focal Spot)



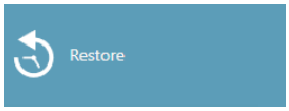
37. Once the procedure is finished, press the “Store” button to save the data.

    The Filament curves of the calibrated Tube can be checked in the Filament Graphs screen *(refer to Section 2.4.1.8).*

Note ☞ *The Filament Stand-by value is adjusted by the Generator during the Auto Calibration process and is automatically stored. Filament Stand-by values should not be field changeable.*

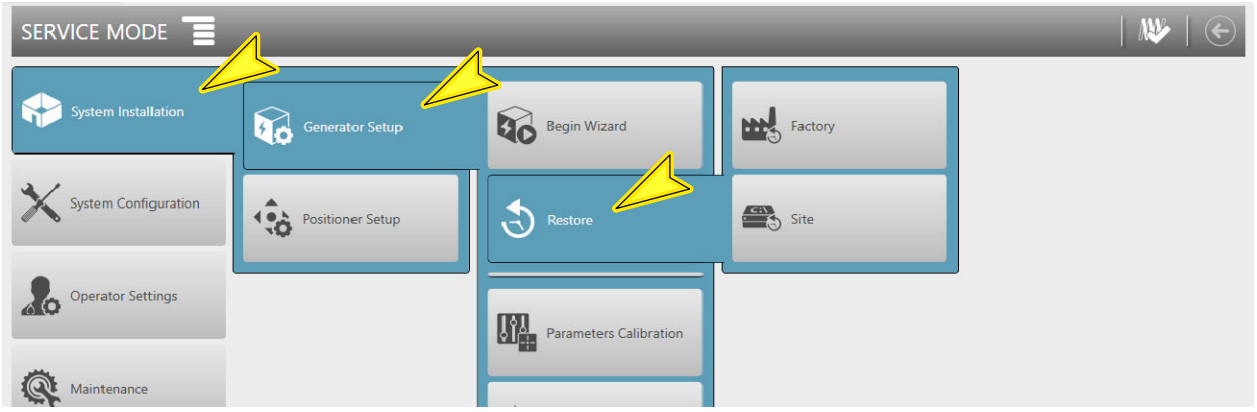
38. Press on the “Cancel” button to return to the Main Menu screen.

2.4.1.3 RESTORE GENERATOR SETUP SETTINGS



"Restore" option allows the Service Engineer to restore the Generator settings.

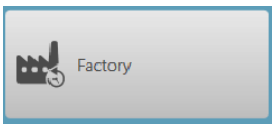
Illustration 2-31
Generator Setup: Restore



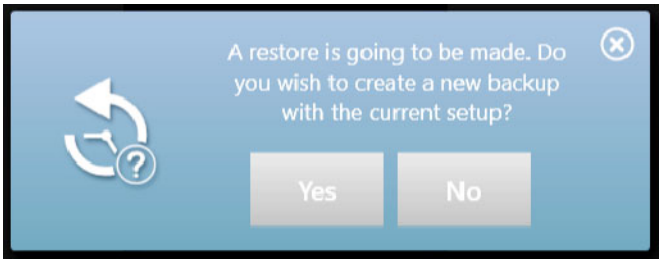
The following restoring options are available:

- "Factory".
- "Site".

▶ **FACTORY:**



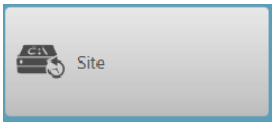
Press the "Factory" button to restore the Generator settings to the Factory defaults for the client; a pop-up message is displayed:



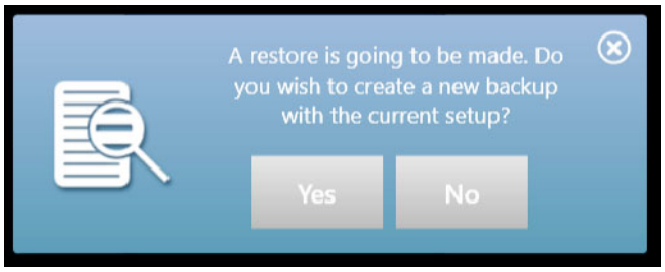
Select "YES" , to create a backup of the current setup before restoring.

Select "NO" to directly proceed to restore the Factory default Calibration.

▶ **SITE:**

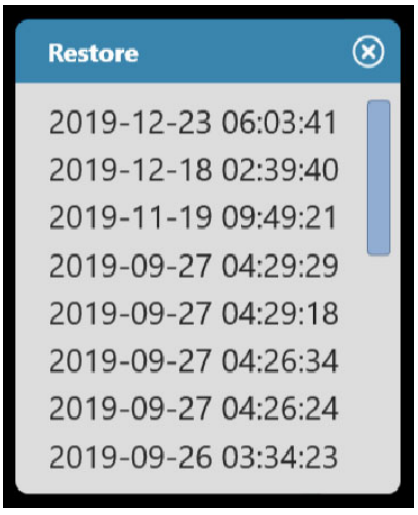


Press on the “Site” button to restore the Generator settings from a previous backup file stored in the system. A pop-up message is displayed:

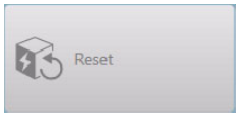


Select “YES” to save a backup of the current data, before restoring the Site Calibration.

Select “NO” to directly access to the Site backup options; a backup list is displayed on the screen, with the date and time of the backup files stored; select the desired file to restore the Generator settings.



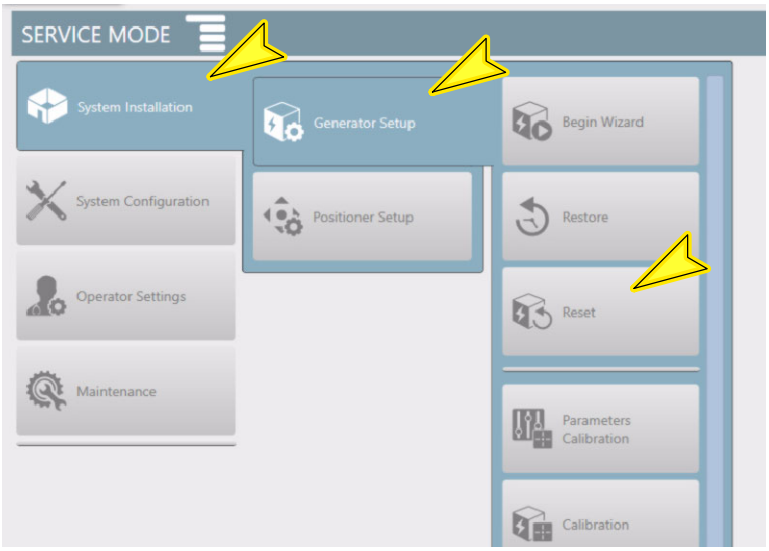
2.4.1.4 RESET (GENERATOR SETUP)



"Reset" option allows the Service Engineer to reboot the Generator and thus the entire Mobile Unit board set.

Note ☞ *Note that this functionality does not launch a complete reboot of the Unit. The PC and control consoles will remain operational.*

Illustration 2-32
Generator Setup: Reset



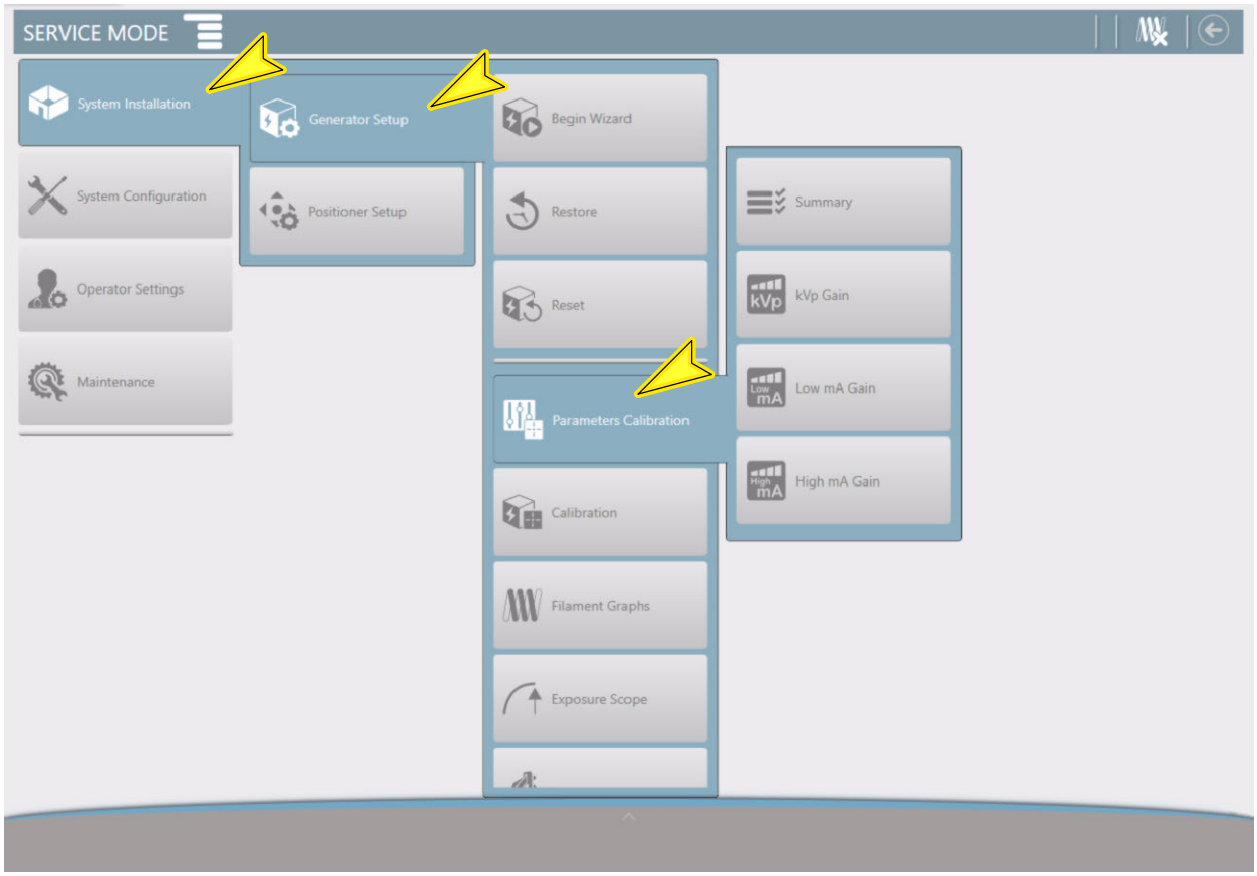
After pressing the "Reset" button, a pop-up window will be displayed to confirm the reboot of the Generator.

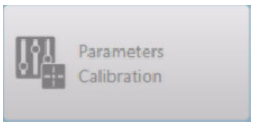
Illustration 2-33
Generator Setup: Reset Confirmation

Confirm the reset action to begin the restart.

2.4.1.5 PARAMETERS CALIBRATION

Illustration 2-34
Generator Setup: Parameters Calibration

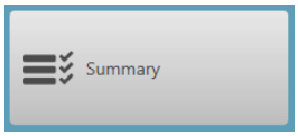




Select the “Parameters Calibration Setup” menu, the following options are displayed:

- “Summary”.
- “kVp Gain”.
- “Low mA Gain”.
- “High mA Gain”.

Note ☞ *Refer to the corresponding option described in Section 2.4.1.2, Generator Setup Wizard.*



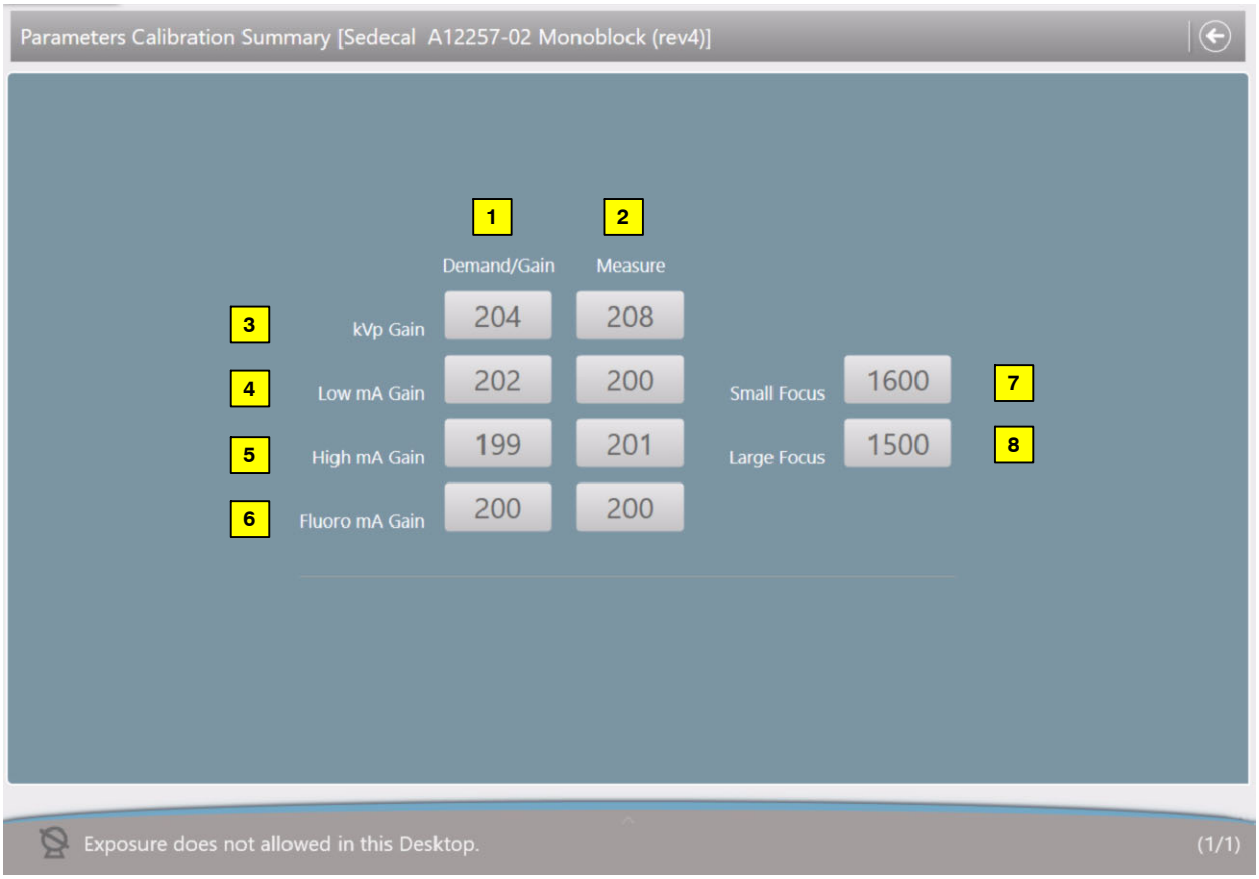
SUMMARY

Parameters Calibration Summary shows the data automatically saved during the Generator Calibration procedures, and shall not be modified by the user.

CAUTION

DO NOT MODIFY ANY PARAMETER VALUE, UNLESS REQUIRED.

Illustration 2-35
Generator Setup: Parameters Calibration-Summary

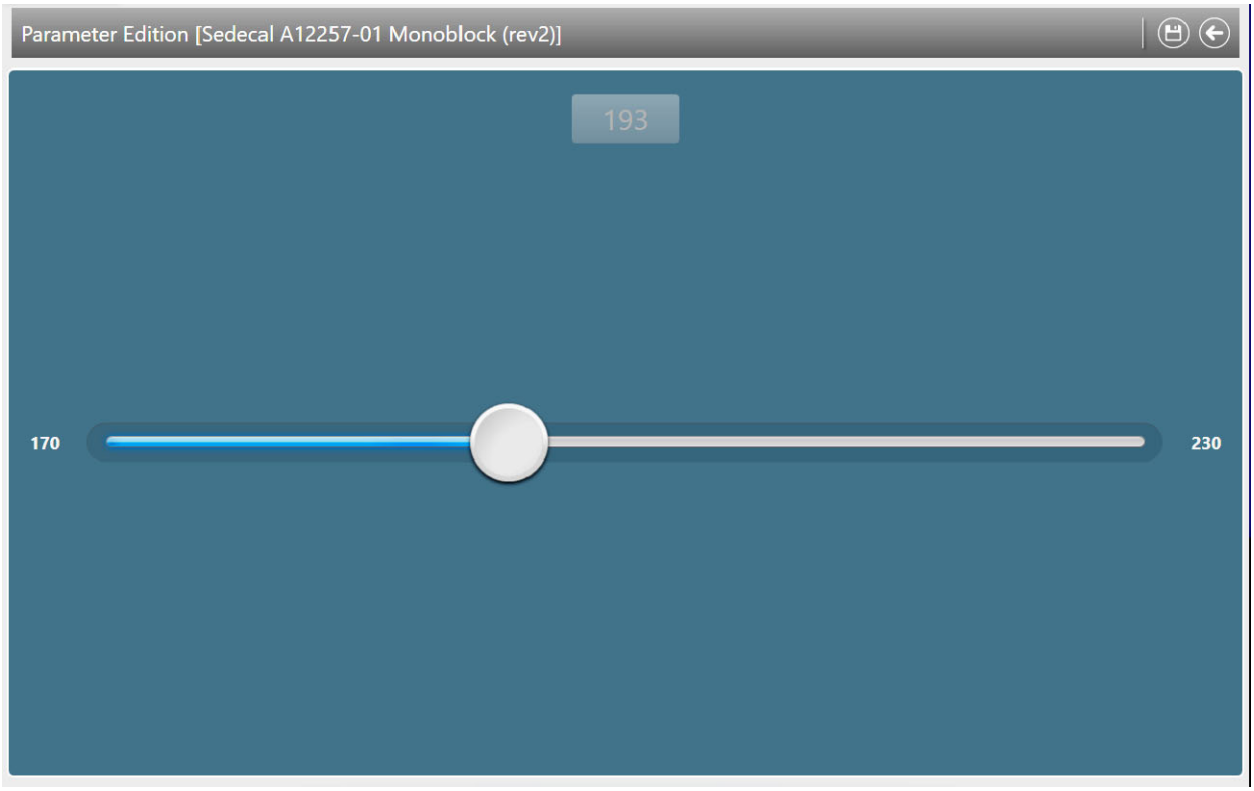


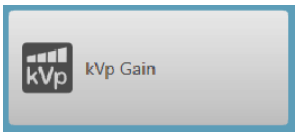
1. Demand/Gain Column
2. Measure Column
3. kVp Gain
4. Low mA Gain
5. High mA Gain
6. *Fluoro mA Gain (not available)*
7. Small Focus
8. Large Focus

When it is required to adjust the value of any parameter, press on the field of the corresponding parameter; it will appear the Parameter Edition screen.

Modify the value with the slider and press on the “Store Data” button; the value will be automatically stored.

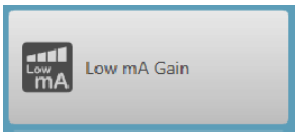
Illustration 2-36
Service Mode: Parameter Edition





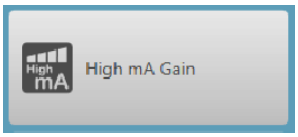
kVp GAIN.

Note ☞ *Refer to the corresponding option described in Section 2.4.1.2, Generator Setup Wizard.*



LOW mA GAIN.

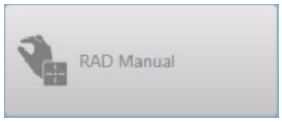
Note ☞ *Refer to the corresponding option described in Section 2.4.1.2, Generator Setup Wizard.*



HIGH mA GAIN.

Note ☞ *Refer to the corresponding option described in Section 2.4.1.2, Generator Setup Wizard.*

2.4.1.6 MANUAL CALIBRATION (RAD MANUAL)



This procedure describes the Manual Calibration of all the Filament Current data.

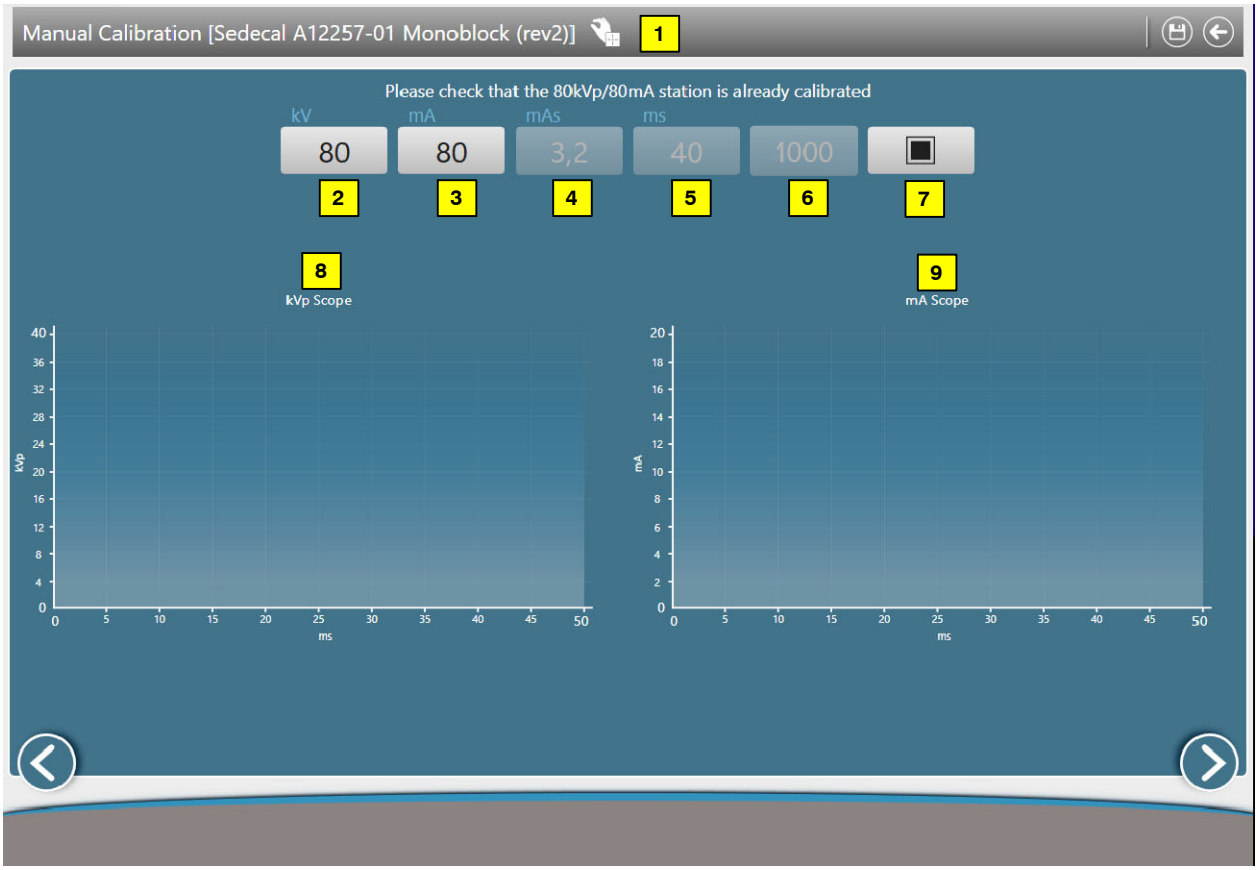
Note ☞

Perform the procedures explained in this section only if the Automatic procedures cannot be done or to calibrate the kV/mA combinations not performed during the Auto Calibration procedure if it has not been completed. These combinations have the Filament Current data set to "1000", so only these combinations have to be manually calibrated as described in this procedure.

If Auto Calibration for one of the Focal Spots has been successful, it is only required to perform the manual calibration of the mA stations that have not been calibrated for the other Focal Spot.

Illustration 2-37
Generator Setup: Manual Calibration (Calibration -> RAD Manual)

Illustration 2-38
Wizard: Manual Calibration



1. Tube Insert model	4. mAs	7. Focal Spot
2. kV	5. ms	8. kVp scope
3. mA	6. Filament data	9. mA scope

Manual Calibration is initiated at the Low kVp break point (40kV) by entering the appropriate Filament Current data for the proper tube current, at each selectable mA.

Calibration of the kV break points, Low: 40kVp, Medium: 80kVp and High: 120kVp, are obtained by adding or subtracting values as indicated in Table 2-1.

Although the suggested values *(refer to Table 2-1)* could change depending on the X-ray tube used, entering those values will approximate accurate Calibration without making excessive exposures.

Table 2-1
mA Calibration Data Change

mA STATION	FILAMENT CURRENT DATA AT kV BREAK POINT		
	Low kVp	Medium kVp	High kVp
10	A_1	A_1-30	A_1-45
12.5	A_2	A_2-30	A_2-45
16	A_3	A_3-30	A_3-45
20	A_4	A_4-30	A_4-45
25	A_5	A_5-30	A_5-45
32	A_6	A_6-30	A_6-45
40	A_7	A_7-30	A_7-45
50	A_8	A_8-30	A_8-45
63	A_9	A_9-30	A_9-45
80	A_{10}	A_{10}-30	A_{10}-45
100	A_{11}	A_{11}-50	A_{11}-70
125	A_{12}	A_{12}-50	A_{12}-70
160	A_{13}	A_{13}-50	A_{13}-70
200	A_{14}	A_{14}-50	A_{14}-70
250	A_{15}	A_{15}-50	A_{15}-70
320	A_{16}	A_{16}-70	A_{16}-100
400	A_{17}	A_{17}-70	A_{17}-100
500	A_{18}	A_{18}-70	A_{18}-100
630	A_{19}	A_{19}-70	A_{19}-100

Note.— The mA station values depends on the Mobile model. Some models do not contain all the mA stations listed above.

In “Manual Calibration” mode, the Filament Current data is shown on the Filament Data field after selecting the respective kV/mA combination. The value can be changed using the slider and stored by pressing the “Store Data” button.

Note that in Manual Calibration mode, only the mA stations and kV (at the break points) can be selected.

CAUTION

Filament Data (currently in memory) may be or may be not close to your requirements.

If it is not close, the potential exists to damage the X-ray tube (i.e. too much mA).

Thus, when the Filament Data is modified, note how close or how far from the mA break points (maximum available mA in selected kV and Exposure Time) measured mA value is.

When the actual measured mA is too small and it is desired to increase the Filament Data dramatically (more than 40 points), the new Filament Data should be properly estimated in advance so that the actual mA will not exceed the mA break points.

Note ☞ *Use a **mA/mAs meter** to measure mA/mAs, refer to Section 2.3.*

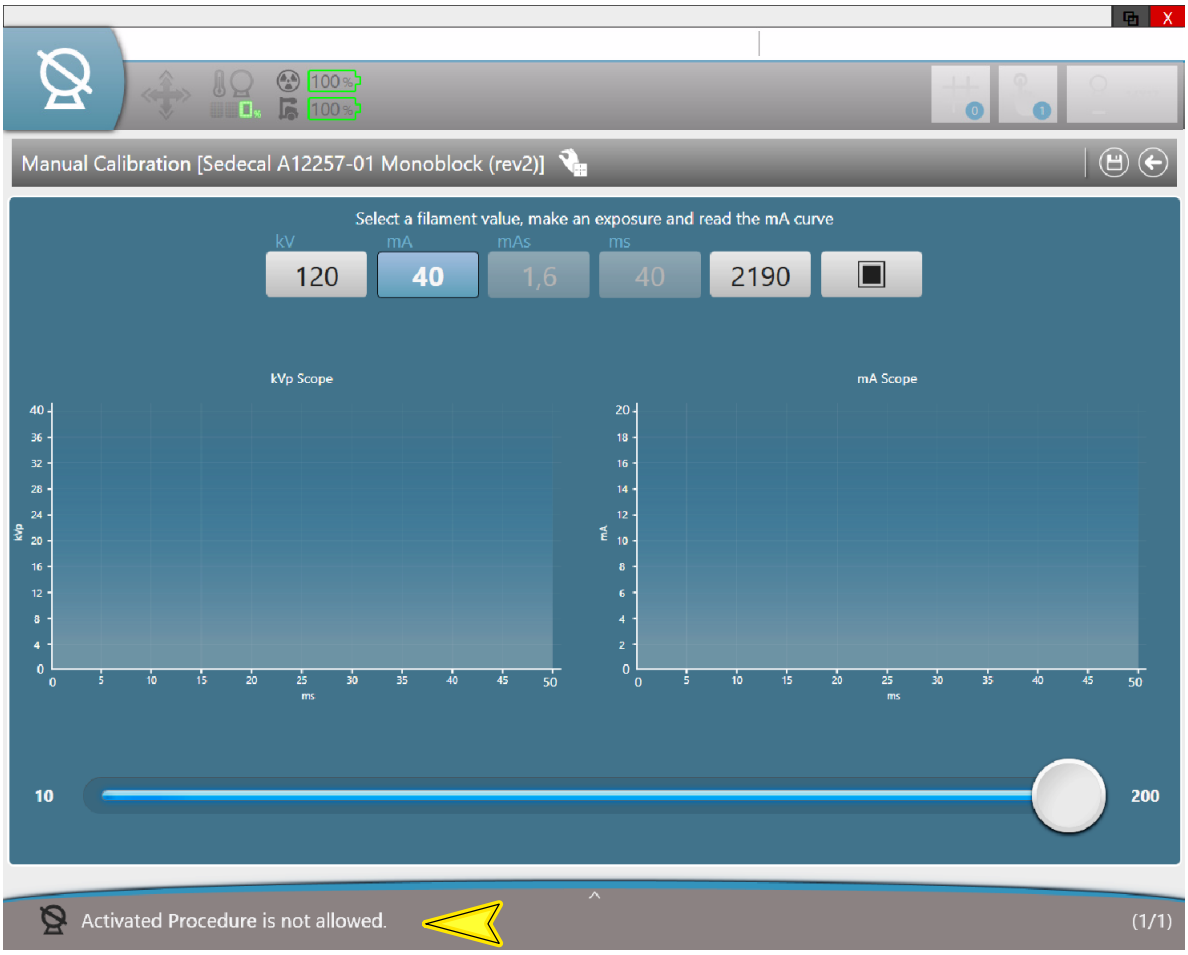
1. Enter in Manual Calibration mode by selecting “System Installation > Generator Setup > Calibration> RAD Manual” from the Service Tool menu.
2. Check that the Heat Units used by the X-ray Tube are 0% or nearly so.
3. According to X-ray tube ratings or maximum Generator power, check which kV/mA combinations in Table 2-1 are allowed.

Note ☞ *When the kV/mA combination exceeds the Tube rating or the Generator power, the system displays the symbol of “Inhibition Condition” (refer to section 2.2).*

An Inhibition Message informing that the activated procedure is not allowed.

The LED Status Indicator on the Head-Assembly remains in red (Service Mode) instead of Cyan, indicating that the system is not ready for exposure.

Illustration 2-39
Service Mode: Manual Calibration–Activated procedure not allowed



Note ☞ *Note which combinations in Table 2-1 can not be calibrated by making exposures (combinations not allowed due to Tube rating, maximum Generator power, space charge, etc.).*

Note ☞

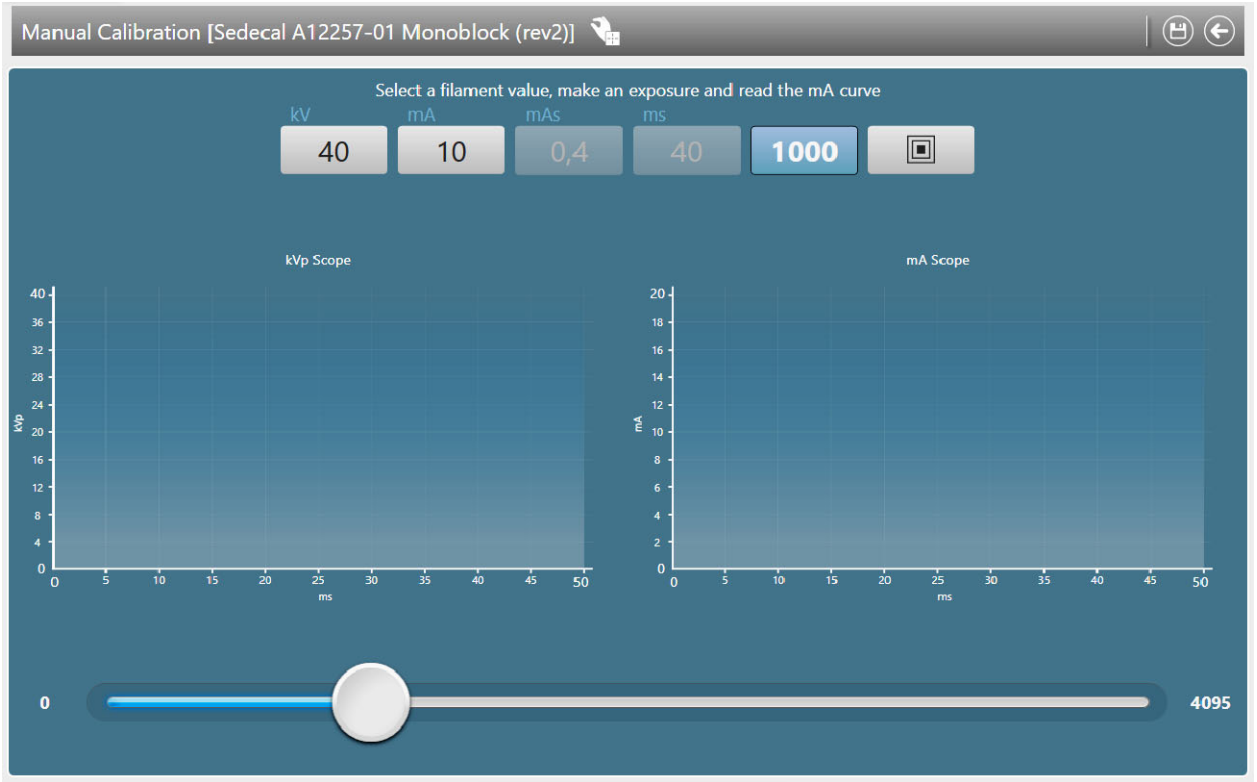
If Auto Calibration has not been performed before initiating the Manual Calibration or no kV/mA combination has been calibrated for any reason, it is recommended to start the Manual Calibration by selecting 40 kV and the lowest mA station available (see Illustration 2-40).

Start increasing the Filament Data in 100 steps, making exposures and calculating the mA based on the measured mAs.

Then, increase the Filament data in 10 points for every mA that is needed to be increased (only when calibrating mA stations lower than 25 mA) and make another exposure.

Adjust the Filament data to obtain the desired mAs and proceed to calibrate the rest of the desired kV/mA stations using the Filament data of the calibrated station as a reference and Table 2-1 as a guide, as explained in this section.

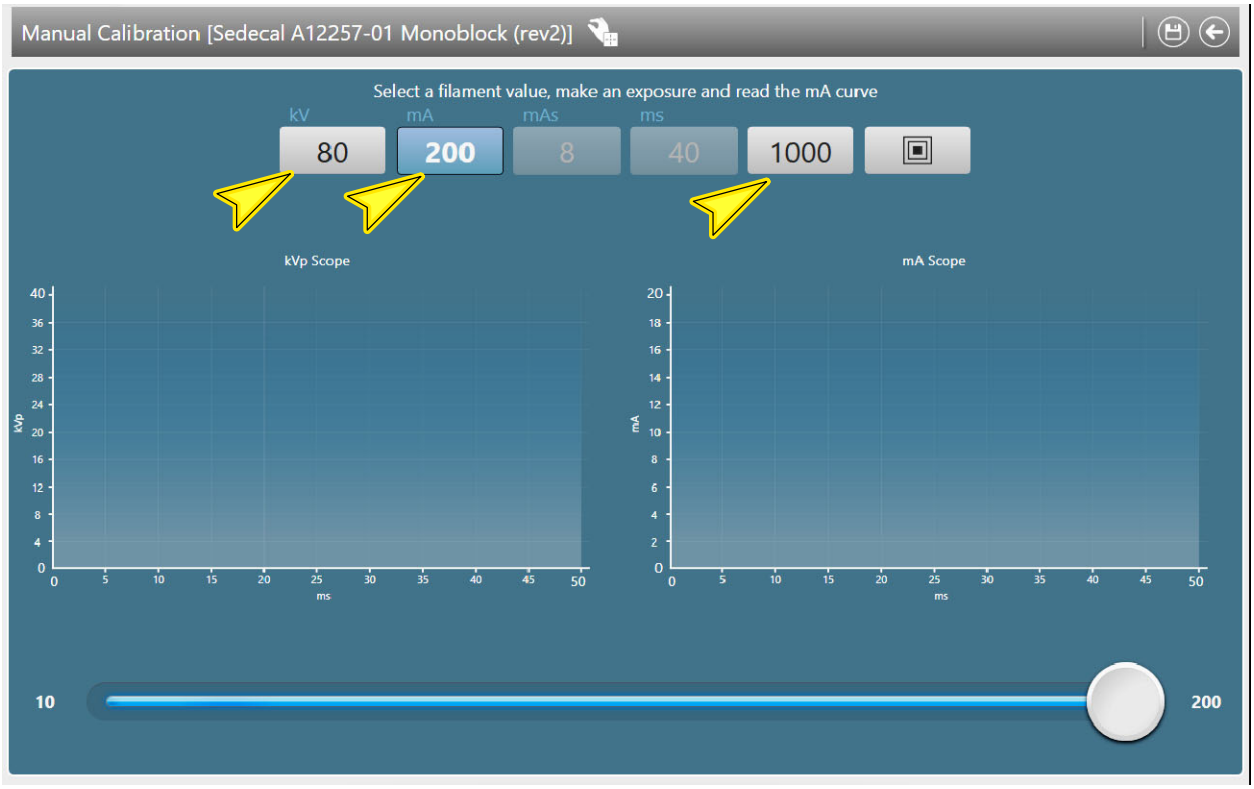
Illustration 2-40
Service Mode: Manual Calibration: 40kV-10mA



4. Select the lowest kV/mA combination available that was not automatically calibrated (Filament Data set to “1000”).

   E*.g., select* ***80kV, 200mA, Filament Data 1000 (Small Focus).***

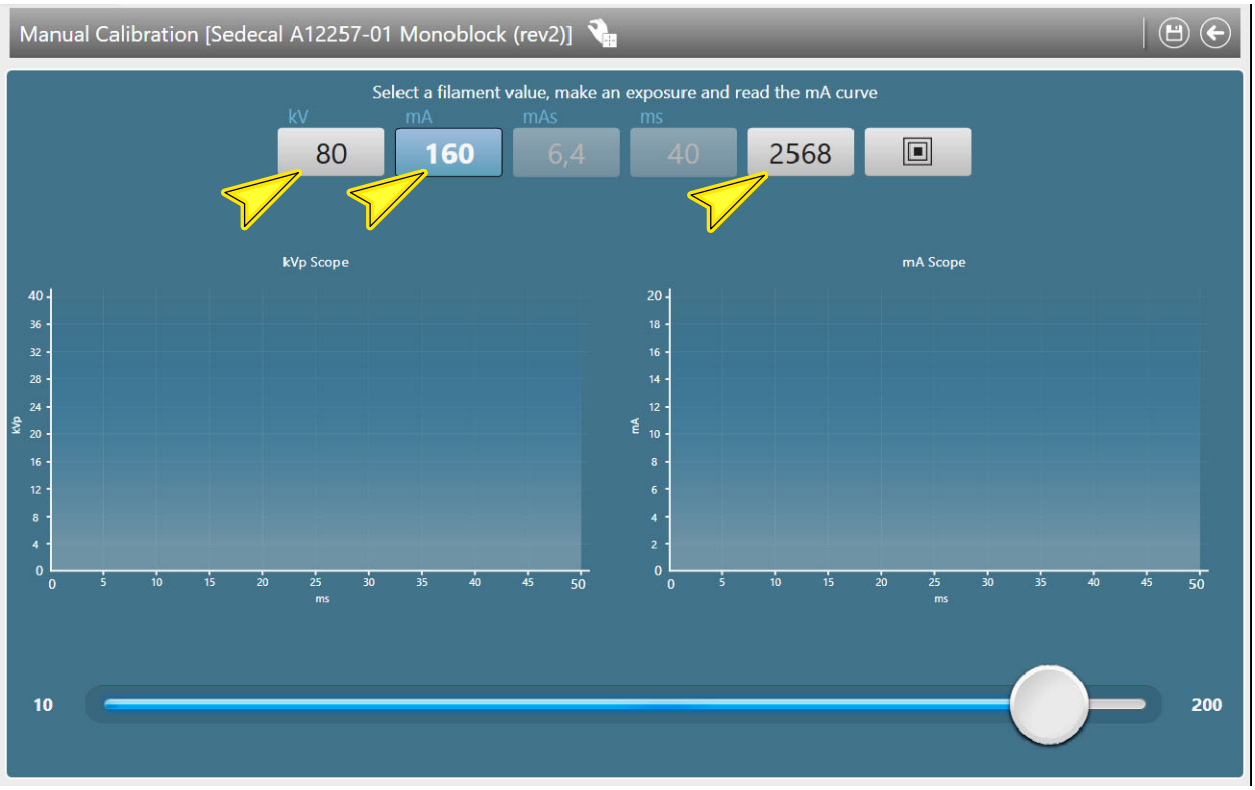
Illustration 2-41
Service Mode: Manual Calibration- 80kV, 200mA, Filament Data 1000.



5. Check the previous mA station.

   *E.g., select **80kV, 160mA, Filament Data 2568 (Small Focus).***

Illustration 2-42
Service Mode: Manual Calibration–Previous mA station: 80kV, 160mA, Filament Data 2568.

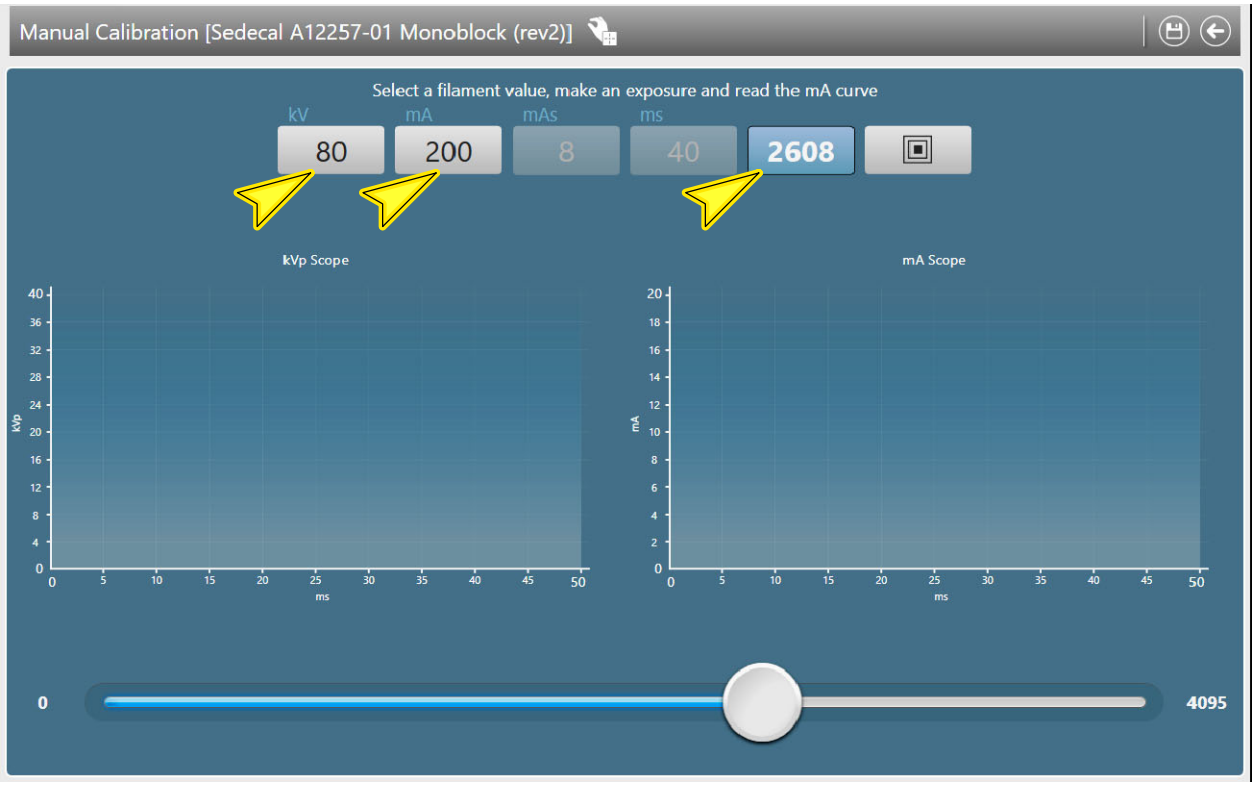


6. Return to step 4.

   Enter the Filament Current data of the previous mA station for the same kV **increased in 40** by using the slider.

   E.g., ***80kV, 200mA, Filament Data 2568+40 (Small Focus).***

Illustration 2-43
Service Mode: Manual Calibration- 80kV, 200mA, Filament Data 2568+40.



7. Make an exposure.

   The mAs read on the mA/mAs meter must be the same mAs displayed on the Calibration screen with a tolerance of ± 0.1 mAs (tolerance of the parameter and mA/mAs meter).

8. If the mAs is low, increase the filament data; if the mAs is high, decrease the filament data. Repeat until the mA station is calibrated.

9. Press on the the “Store Data” button once the kV/mA station is calibrated.

Note ☞ *Press on the "Store Data" button to store the new data (Filament Current) before selecting the next kV or mA stations.*

10. Select the next mA station at Low kVp, increase in 40 the Filament Current data calibrated for the previous mA station and repeat steps 7. and 8.

Note ☞ *To make calibration easier, Filament Data is kept the same when moving up or down one mA or kVp station after storing a new Filament value.*

To check the real value of a kVp/mA combination consecutive to the combination that has been just stored, select the kVp/mA combination to be checked, then, select the next or the previous kVp or mA station and return to the kVp/mA combination to be checked.

11. Complete the Calibration process for all mA stations at Low kVp as described before.

    The new values stored for the calibrated mA stations appear in the Filament Data field when selecting the desired station.

12. Select the kV/mA combinations not allowed for Low kVp and store as their Filament data the value of the previous mA station increased in 40.

13. Complete the Calibration process for the remaining kV/mA combinations at Medium and High kVp **using Table 2-1 as a guide.**
    It is not necessary to make exposures to do so.
    Calculate the value for all the kV break points of each available mA station, even for those combinations that are not reachable due to the Generator power limit.

    Select the corresponding kV/mA combination and enter the calculated value.

14. Check Calibration at all break points (making exposures) and correct any Filament data as needed.

Note ☞ *If the "Tube Overload" Error is displayed right after the selection of an allowed combination (refer to step-3.), wait for the X-ray Tube anode to cool down, in order to allow the Calibration of the mA station.*

15. Recalculate the values of the non-allowed combinations in accordance to the new values obtained by exposures. (*Refer to Table 2-1*).

16. Since exposures are required at this point, access the acquisition window of the Imaging System or access the “Exposure Scope” functionality in the Generator Setup menu of the Service Mode (*refer to Section 2.4.1.9*).

    Select the nearest allowed kVp value to each kV/mA combination not allowed (keeping the same mA).

    Check Calibration at these kV/mA combinations by making exposures.

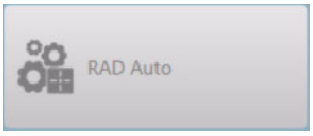
    If needed, correct the Filament Current data of the respective non-allowed kV/mA combination in the “Manual Calibration” screen.

17. Exit from the Manual Calibration mode.

18. After Calibration of the Filament Current data:

    - Switch the system Power OFF
    - Disconnect the mA/mAs meter from TPS1 and TPS2 on the *Advanced Control Board A3678-XX.*
    - Reinstall the link between TPS1 and TPS2.

2.4.1.7 AUTO CALIBRATION (RAD AUTO)

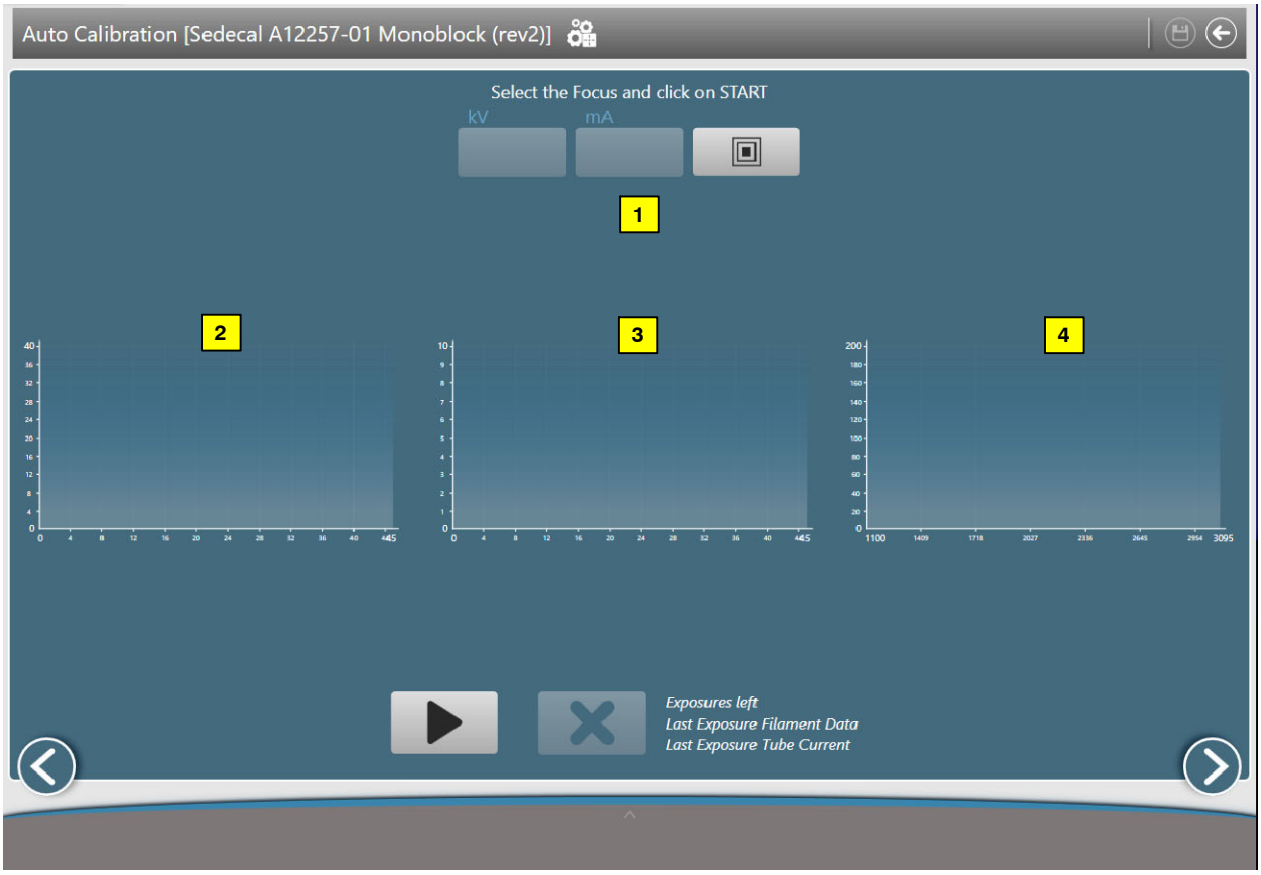


Refer to *Illustration 2-23 step of the Generator Setup Wizard (Section 2.4.1.2)*.

Perform the Auto Calibration when the Wizard procedure of Auto Calibration has not finished successfully or has not been completed for one or more stations; avoid repeating the stations successfully calibrated.

Illustration 2-44
Generator Setup: Auto Calibration (Calibration -> RAD Auto)

Illustration 2-45
Wizard: Auto Calibration



1. Focal Spot	3. mA scope
2. kVp scope	4. Filament scope

2.4.1.8 FILAMENTS GRAPHS

Check the Filament Graphs data to make sure that the Calibration is correct, after performing the Auto Calibration procedure.

Press on the “Filament Graphs” button to see the Filament curves of the calibrated Tube.

Illustration 2-46
Generator Setup: Filament Graphs

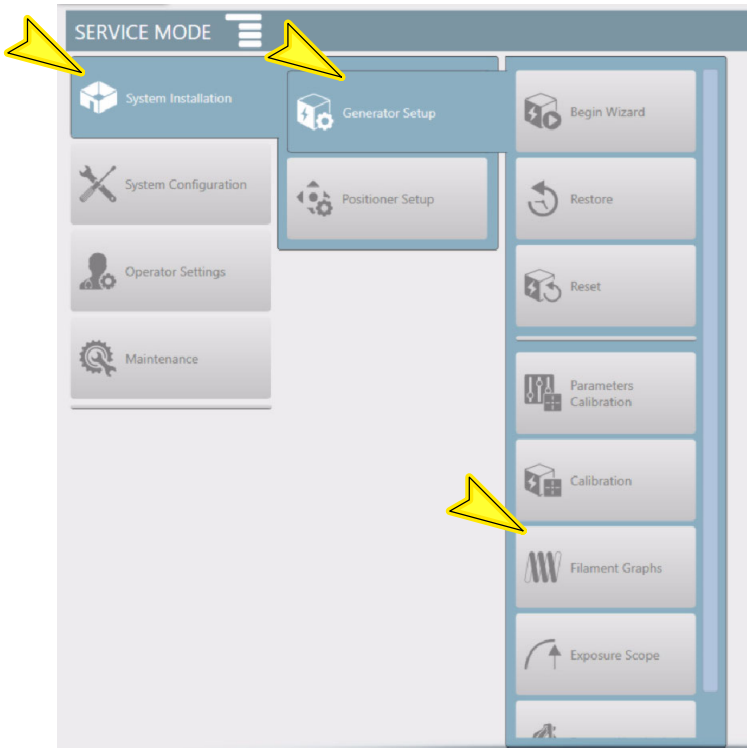
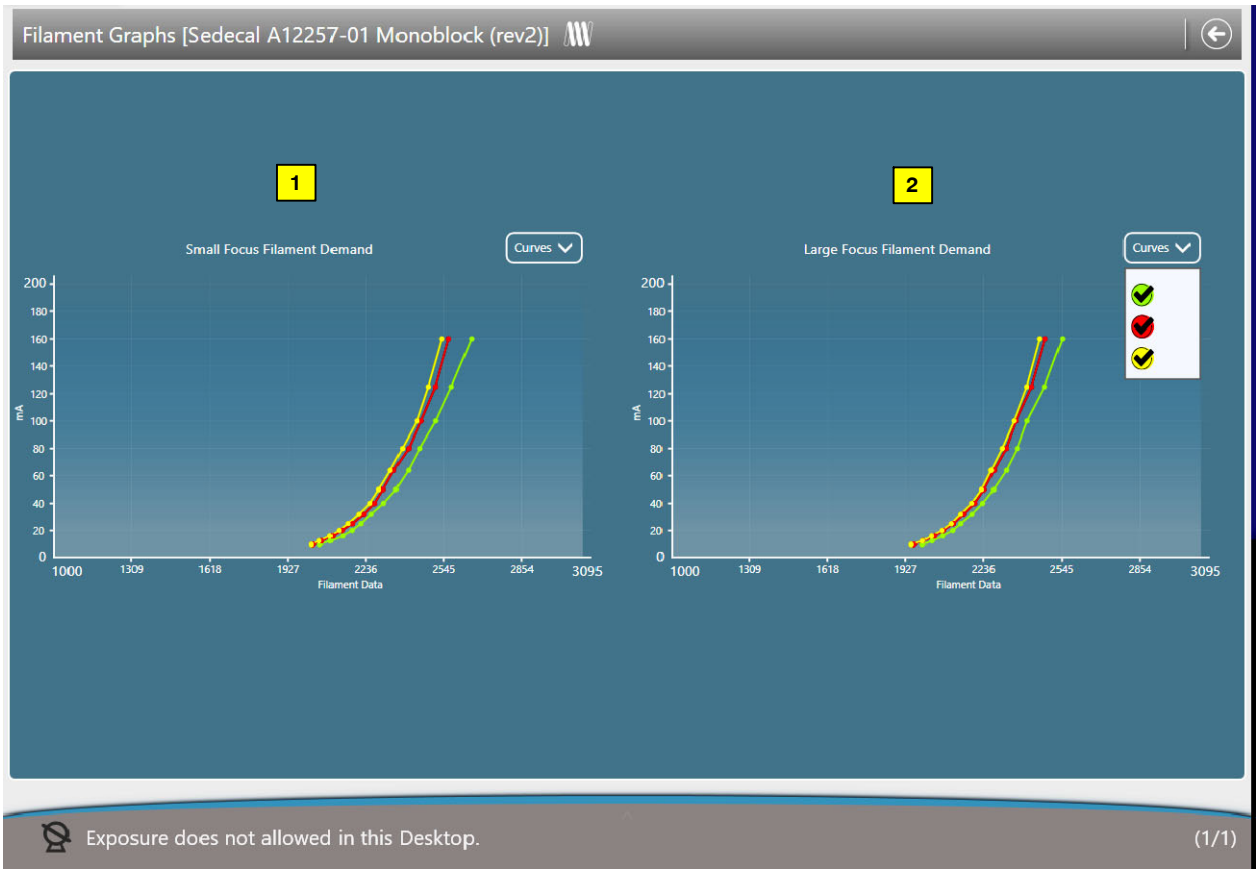


Illustration 2-47
Generator Setup: Filament Graphs-Curves

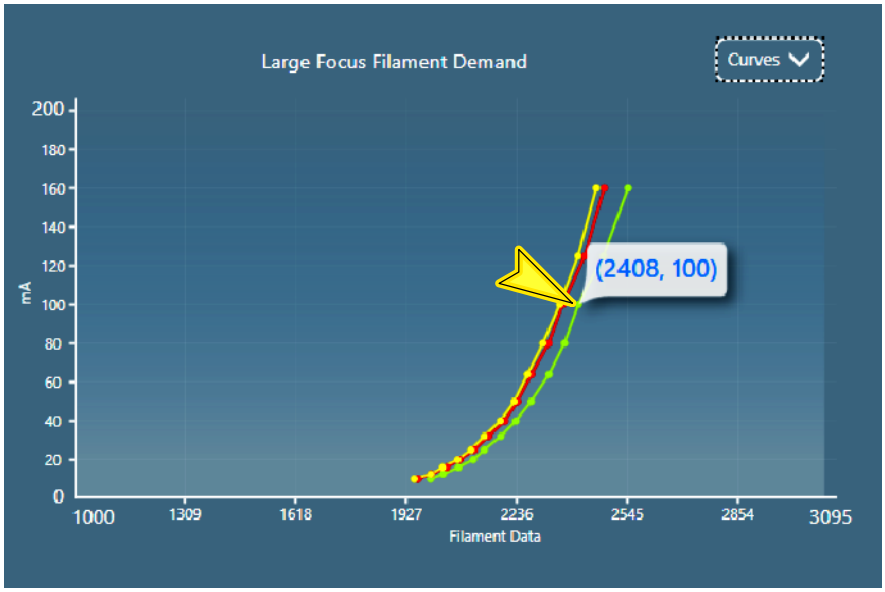


1. Small Focus Filament Demand
2. Large Focus Filament Demand

The left graphic shows the Small Focus Filament data and the right one shows the Large Focus Filament data.

Check that there are neither sawtooth waves nor step waves in the curves graphs; it would indicate an unreliable Calibration.

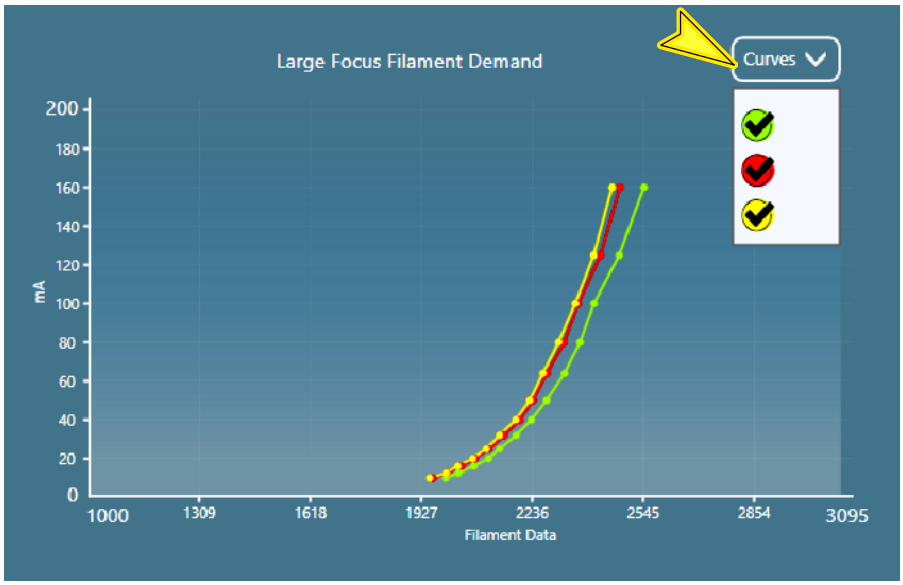
To check the Filament Current data of a specific kV/mA combination, click on the point of the curve that represents the corresponding combination; the Filament data and the mA are displayed at that point.



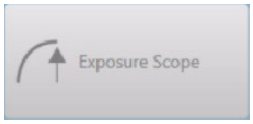
Press on the Curves field, the colors indicate:

- Green: low kVp Curve (40kVp).
- Red: medium kVp Curve (80kVp).
- Yellow: high kVp Curve (120kVp).

Click at the corresponding fields to check the desired curves.



2.4.1.9 EXPOSURE SCOPE



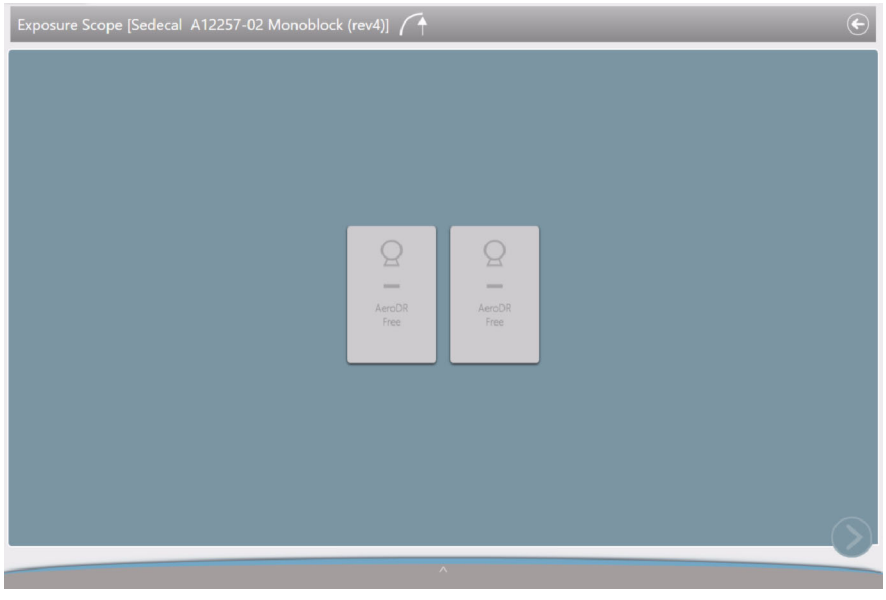
The Exposure Scope can be used as an internal oscilloscope, it shows the measurement made by the microprocessor located on the Advanced Control Board. Nevertheless, it is recommended to connect an external oscilloscope to the Unit to accurately perform the measurements indicated in this document. The measures obtained using the internal oscilloscope are not precise, they can only be used as a visual reference, not as trusted measurements.

Exposure Scope functionality can also be used as a “User Console” within the Service Tool / Service Mode, allowing Service Personnel to select any radiographic parameter (within the range of the Unit) and make exposures from this menu without the need to access the Imaging System / Operator Console.

Firstly select the Workstation where the exposure is going to be performed in accordance with the study selected in the Image Acquisition Software. This step is necessary to allow the synchronization of the Image System with the Workstation where the Ion Chamber and X-ray Detector are installed.

Note ☞ *To proceed with the Workstation selection it is necessary to access the Service Mode from the Head-Assembly Console, while the Acquisition Window of the Imaging System is running on the main screen.*

Illustration 2-48
Workstation Selection Window

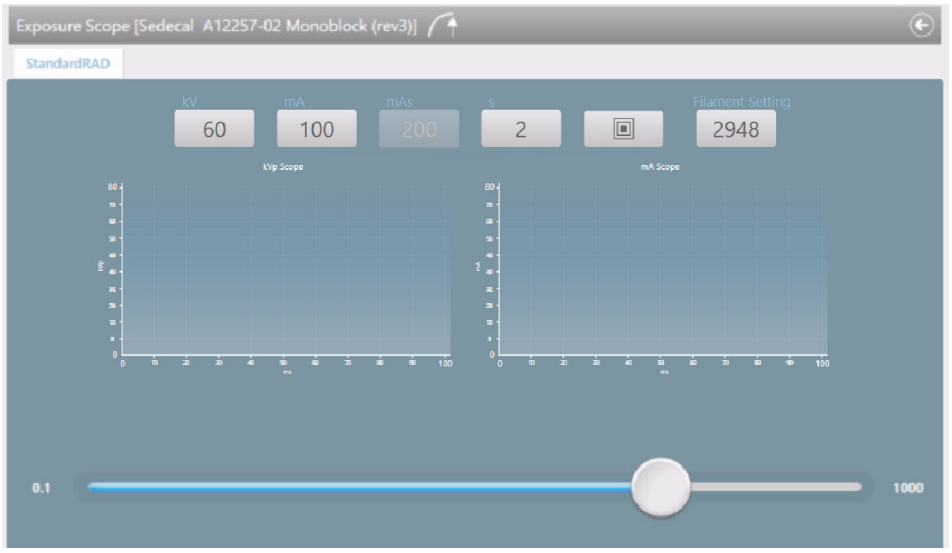


Note ☞ *If exposures without detector synchronization are required, make sure that a “Free” Workstation with a direct synchronization image receptor (“Film”) has been selected. Refer to Section 2.4.2.5.*

The following window is divided in two different fields, related to kVp and mA (with a graphical representation each). Measurement scale is automatically adjusted according to the performed measurements once the exposure has been made.

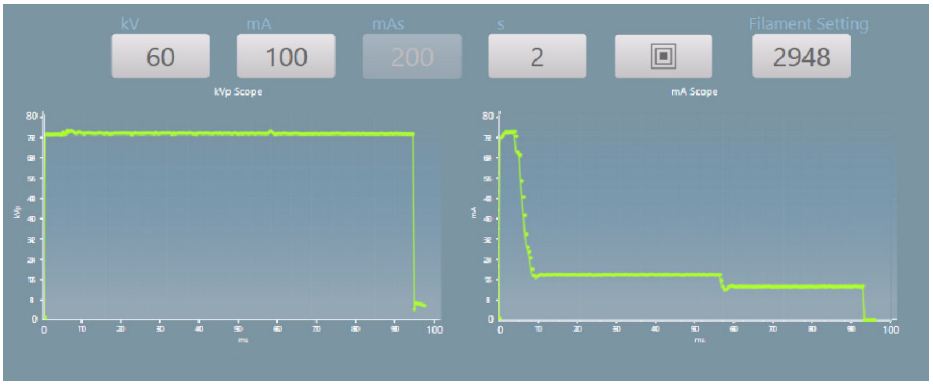
This window enables the selection of the desired parameters (kV, mAs, mA/ms, Filament Data, Focal Spot) for the performance of exposures.

Illustration 2-49
Exposure Scope Window

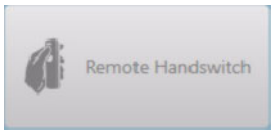


The Exposure Scope graphs display the variation of the radiographic kVp and mAs values during an exposure.

Illustration 2-50
Exposure Scope Graphs

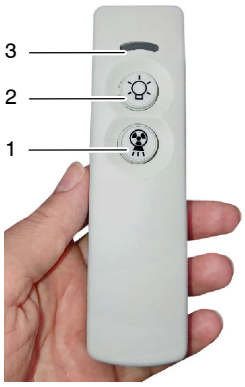


2.4.1.10 REMOTE HANDSWITCH



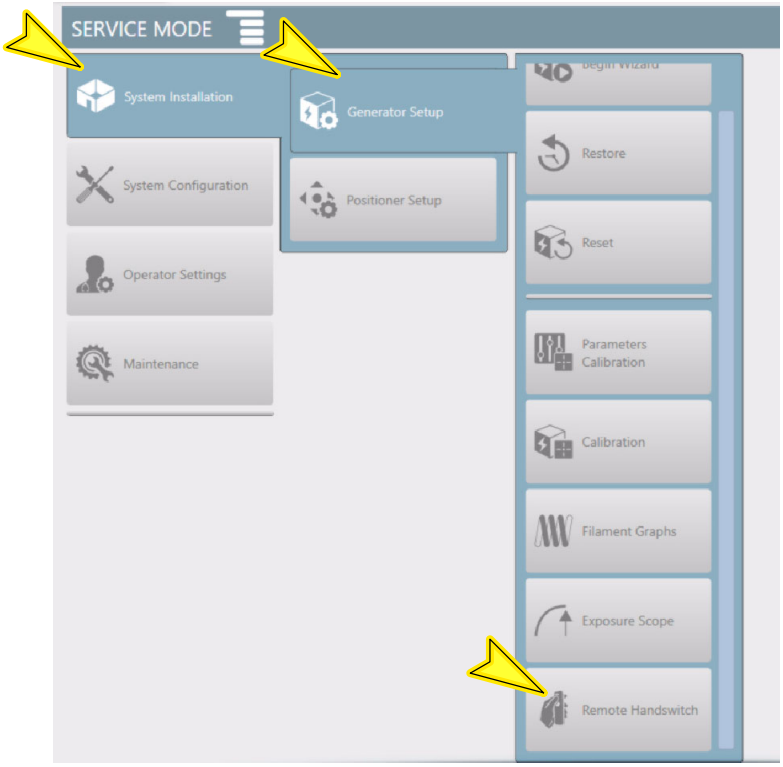
Access to the Remote Handswitch option from the Generator Setup menu, in order to Calibrate the Remote Handswitch, pairing the Remote Handswitch device to the Mobile system.

1 OFF / Prep / Exp
2 Collimator Light
3 Status LED



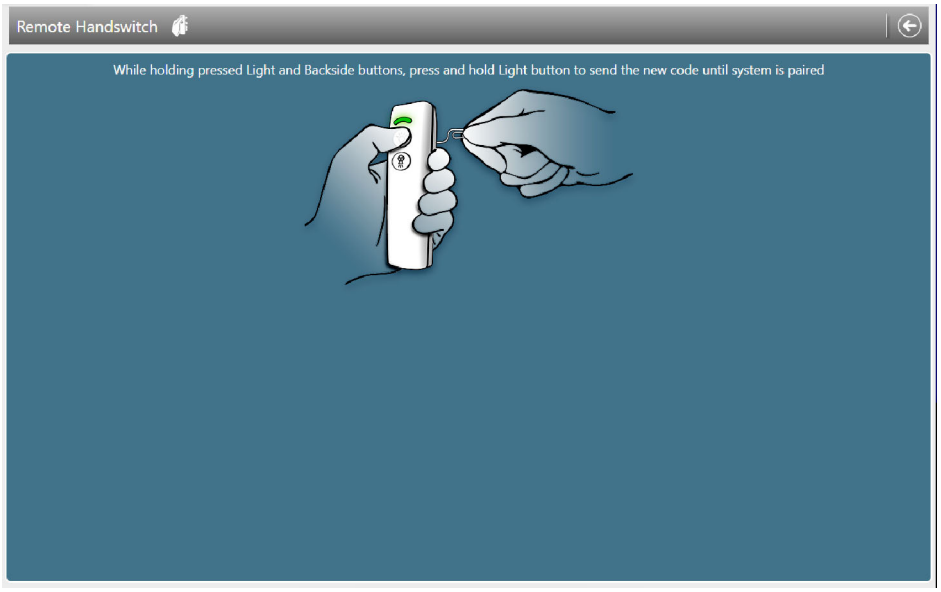
Note ☞ *A paper clip or similar is necessary to access to the inner rear button of the Remote Handswitch.*

Illustration 2-51
Generator Setup: Remote Handswitch



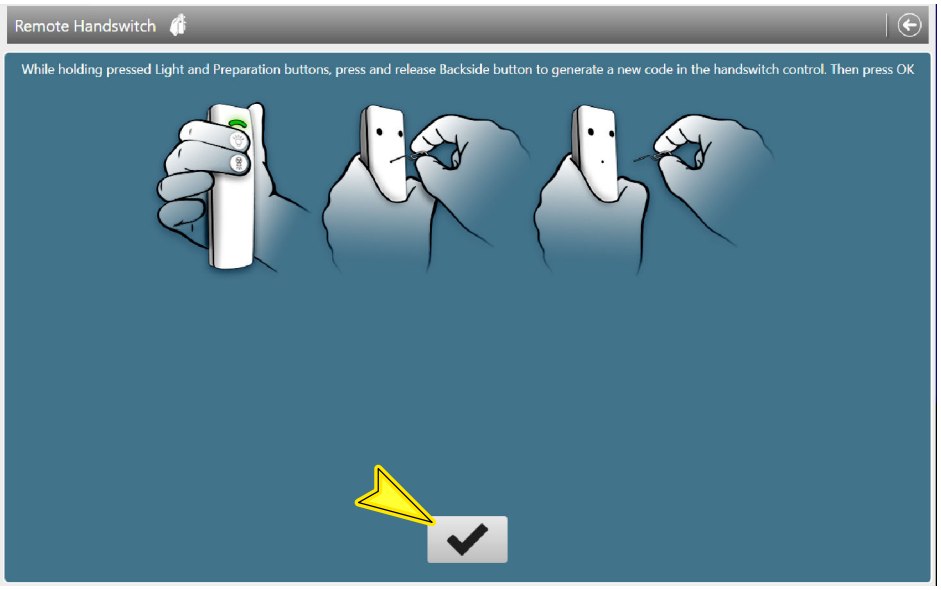
1. Fully press the Collimator Light button while pressing the inner rear button with the paperclip; the Handswitch will send a code to the system in order to be paired.

   Release when the next screen is displayed.

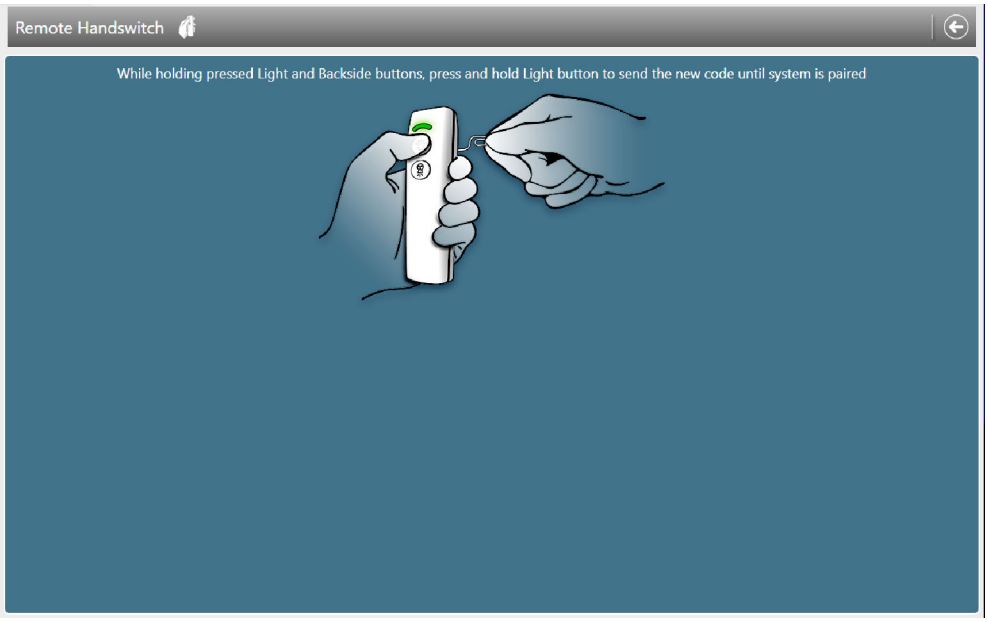


2. Fully press the Collimator Light and “Prep” buttons, while pressing the internal rear button with the paperclip.

   Release all the buttons and press “OK” button.

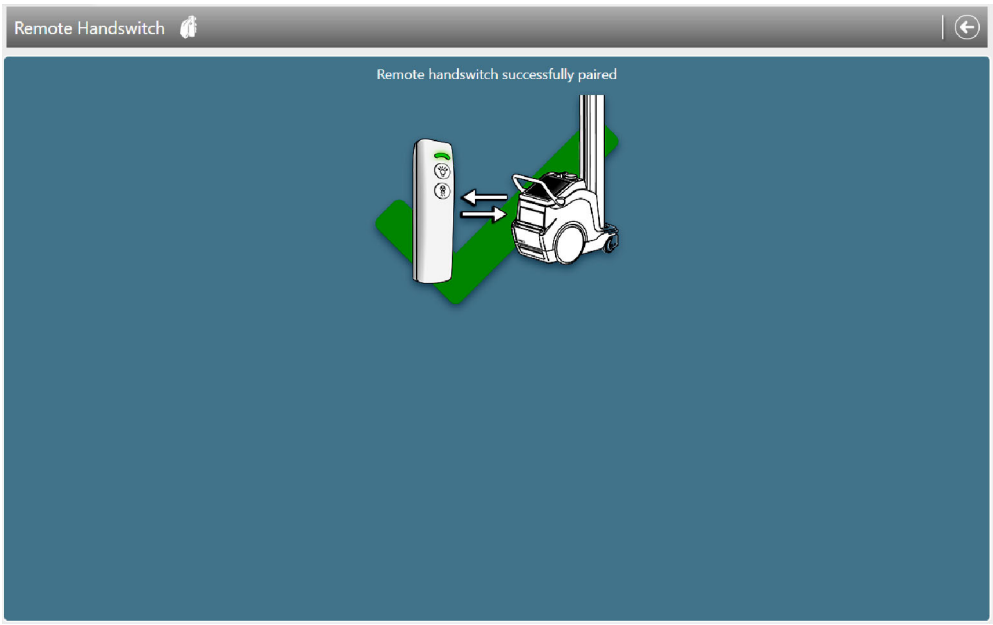


3. Fully press the Collimator Light button again, while pressing the internal rear button with the paperclip too.



4. Release all the buttons when the system displays a message confirming that the Remote Handswitch has been successfully paired to the system.

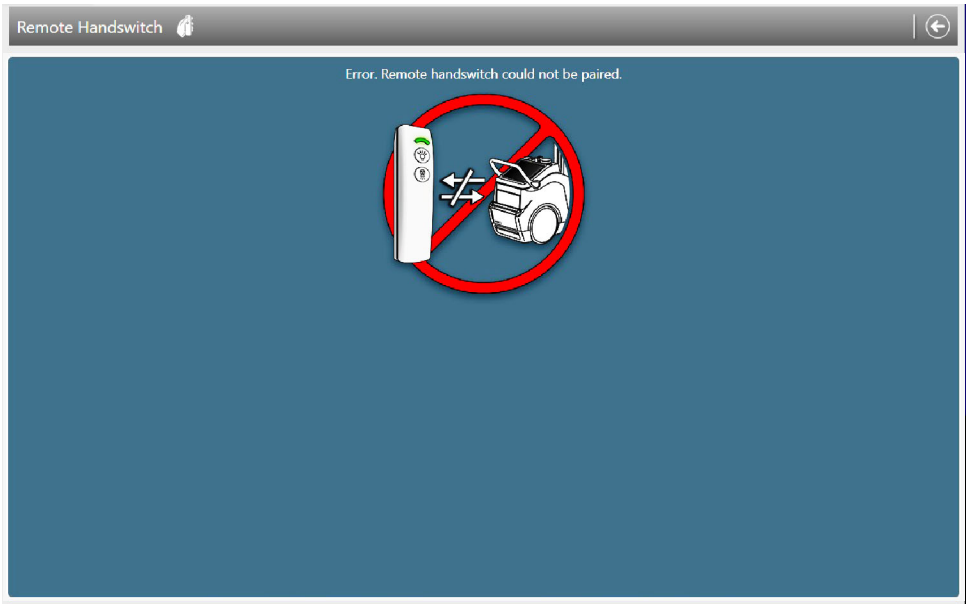
   Press on the “Back” button to return to the menu.



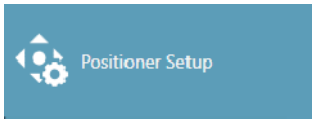
Note ☞

The system will display and error message if the Calibration has failed, indicating that the Remote Handswitch has not been paired.

In this case, repeat the entire procedure from step 1. to the end, ensuring to press the right buttons as required in every step.

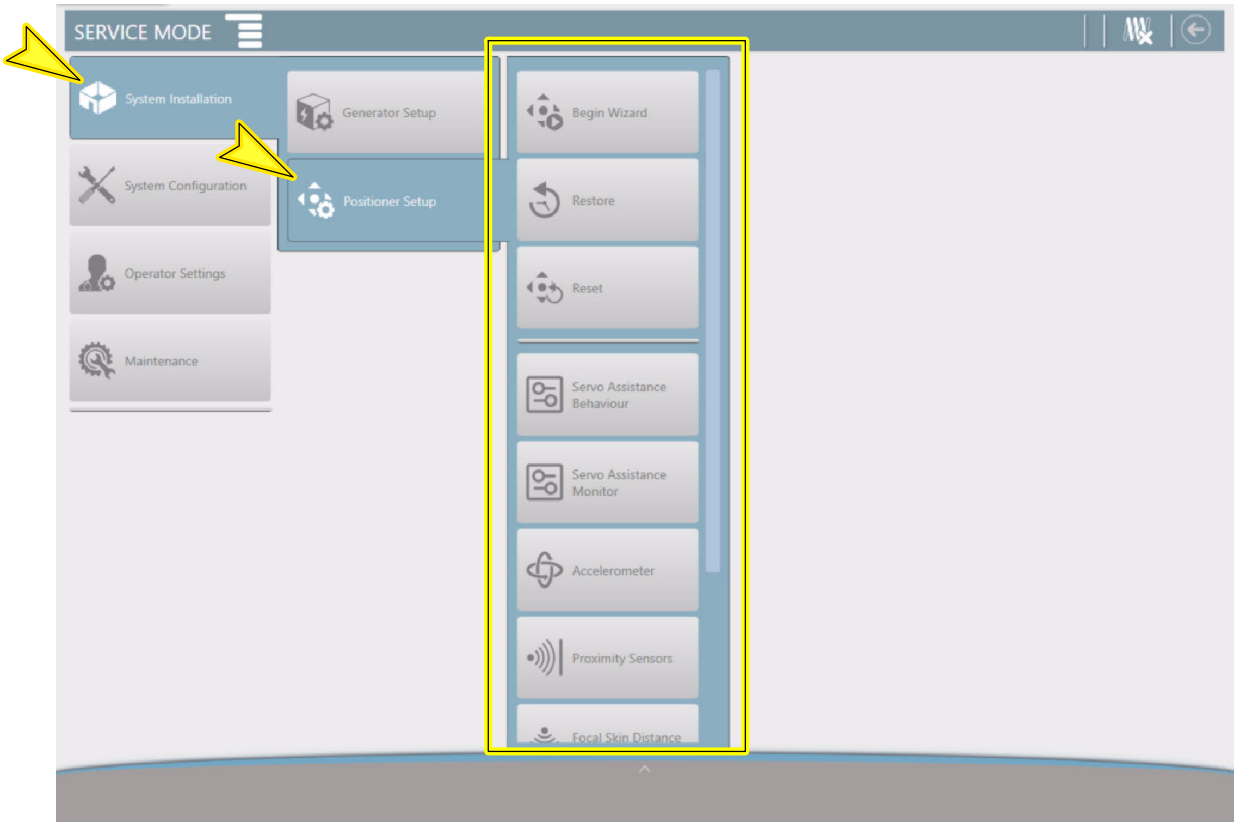


2.4.1.11 POSITIONER SETUP



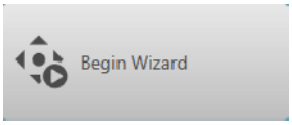
The “Positioner Setup” menu is used to calibrate the System Functions, other than the X-Ray Generator, such as Proximity Sensors, Servo Assistance, Accelerometer, etc.

Illustration 2-52
System Installation: Positioner Setup



- “Begin Wizard”; *refer to section 2.4.1.12.*
- “Restore”*, refer to section 2.4.1.13.*
- “Reset”*, refer to Section 2.4.1.14.*
- “Servo Assistance Behaviour”*, refer to section 2.4.1.15.*
- “Servo Assistance Monitor”*, refer to section 2.4.1.16.*
- “Accelerometer”*, refer to section 2.4.1.17.*
- “Proximity Sensors”*, refer to section 2.4.1.18.*
- “Focal Skin Distance Sensors”; *refer to Section 2.4.1.19*.
- “Collimator Blades”, *refer to Section 2.4.1.20*.
- “EDAP Calibration”, *refer to Section 2.4.1.21*.

2.4.1.12 BEGIN WIZARD

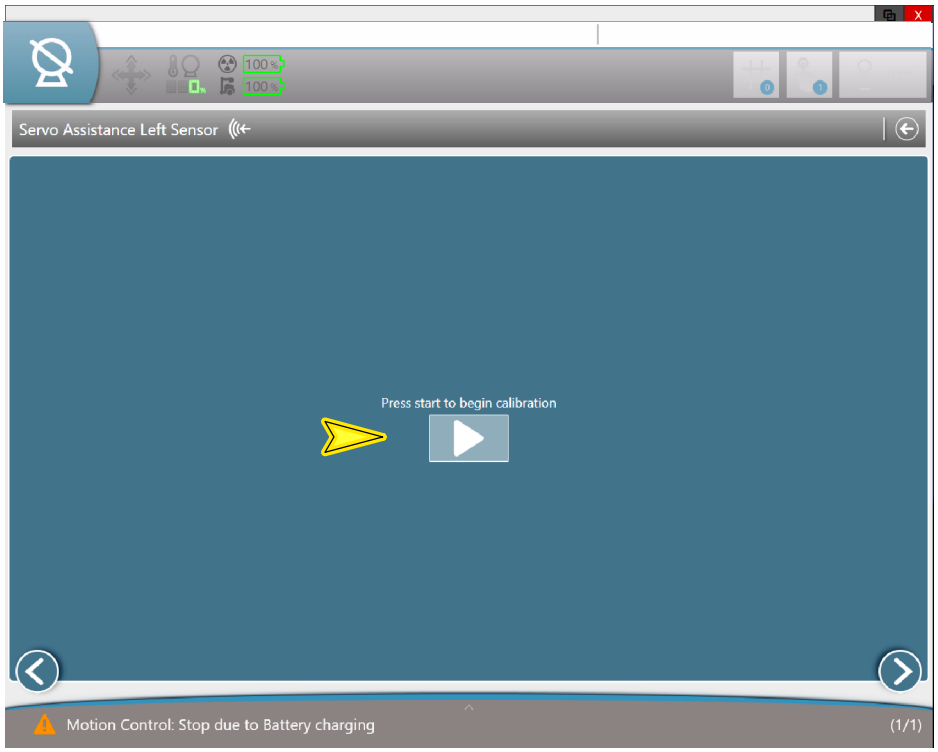


The “Begin Wizard” is the default option for the Positioner Setup Calibration. It is used to calibrate the left and right sensors of the Handlebar.

▶ **SERVO ASSISTANCE LEFT SENSOR:**

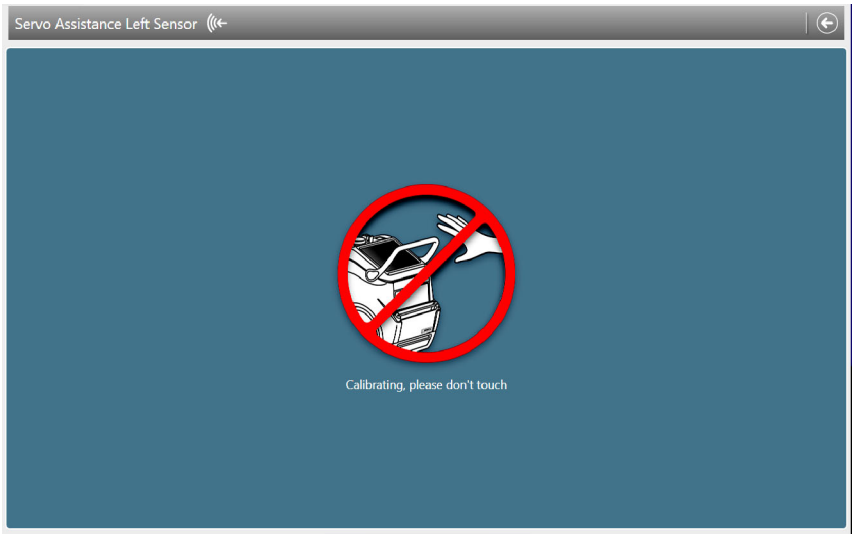
1. Press on the “Start” button to begin the Calibration of the Servo Assistance Left Sensor.

Illustration 2-53
Positioner Setup: Wizard - Servo Assistance Left Sensor



2. The system displays a message for a few seconds to alert the Service Engineer not to touch the Handlebar during this process.

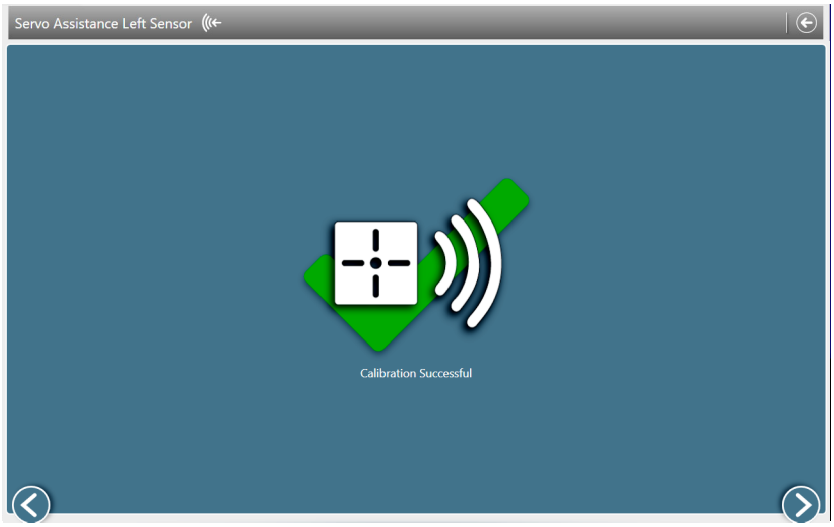
Illustration 2-54
Positioner Setup: Wizard - Servo Assistance Left Sensor: Calibrating



3. After a few seconds, the system displays a message indicating that the Calibration of the Servo Assistance Left Sensor has finished successfully.

   Press on the “Next Step” button to access to the next Calibration screen (*see step 4.*)

Illustration 2-55
Positioner Setup: Wizard - Servo Assistance Left Sensor: Calibration done

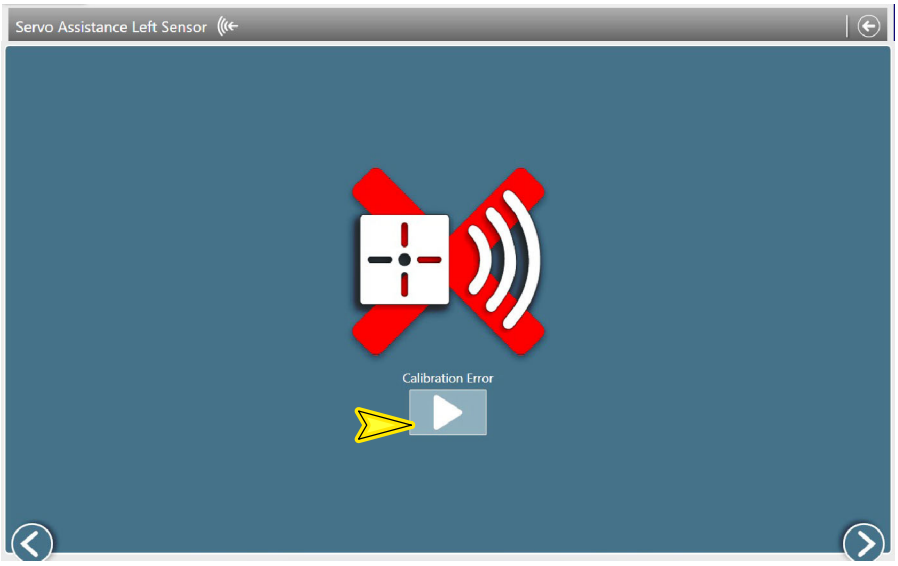


Note ☞

When a failure is detected, the system displays an Error message indicating that there have been a Calibration Error related to the corresponding servo assistance sensor (e.g., when the Handlebar has been accidentally pressed or pulled).

In this case, press the "Start" button to repeat the procedure for the Calibration of the Servo Assistance Left Sensor, taking care not to touch the Handlebar.

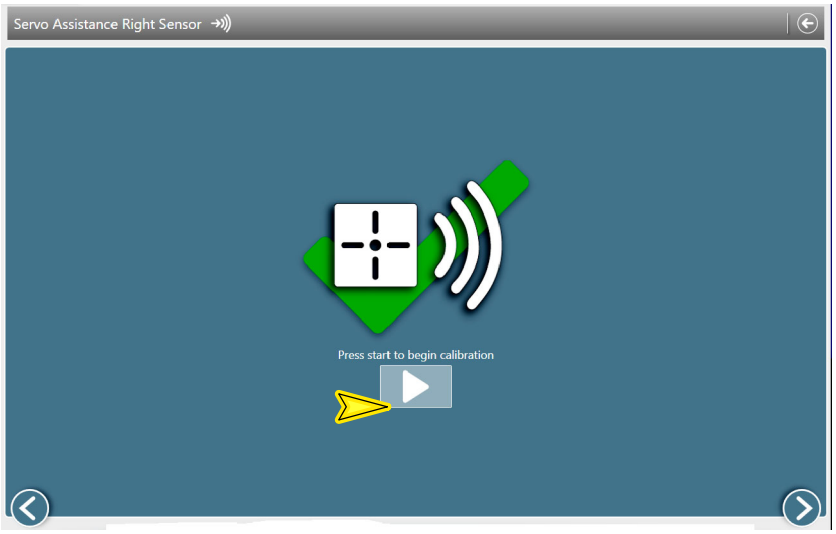
Illustration 2-56
Positioner Setup: Wizard – Servo Assistance Left Sensor: Calibration Error



▶ **SERVO ASSISTANCE RIGHT SENSOR:**

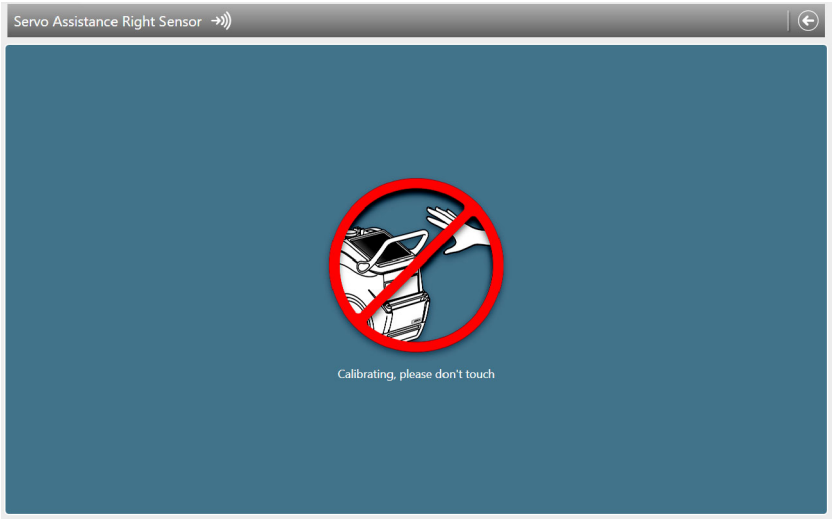
4. Press on the “Start” button to begin the Calibration of the Servo Assistance Right Sensor.

Illustration 2-57
Positioner Setup: Wizard - Servo Assistance Right Sensor



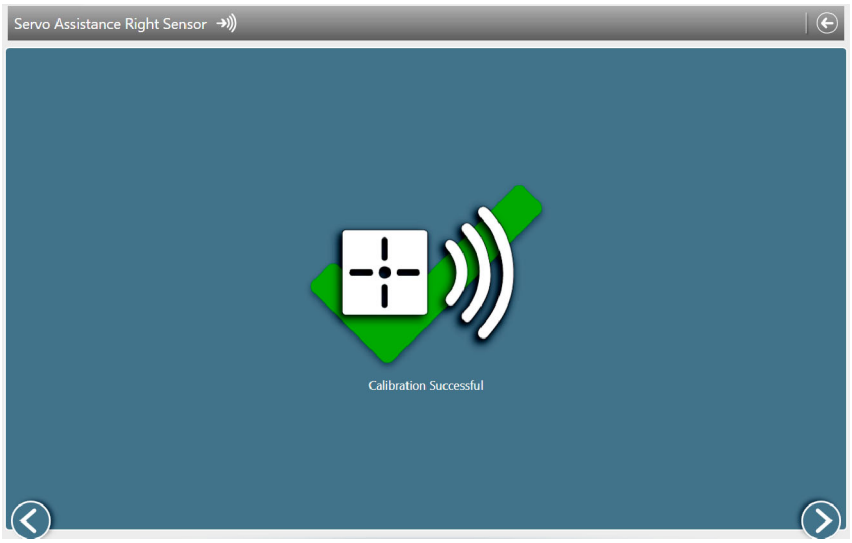
5. The system displays a message for a few seconds to alert the Service Engineer not to touch the Handlebar during this process.

Illustration 2-58
Positioner Setup: Wizard - Servo Assistance Right Sensor: Calibrating



6. After a few seconds, the system displays a message indicating that the Calibration of the Servo Assistance Right Sensor has finished successfully.

Illustration 2-59
Positioner Setup: Wizard – Servo Assistance Left Sensor: Calibration done



7. Press on the “Next Step” button to access to the next Calibration screen.

▶ **SERVO ASSISTANCE BEHAVIOUR**

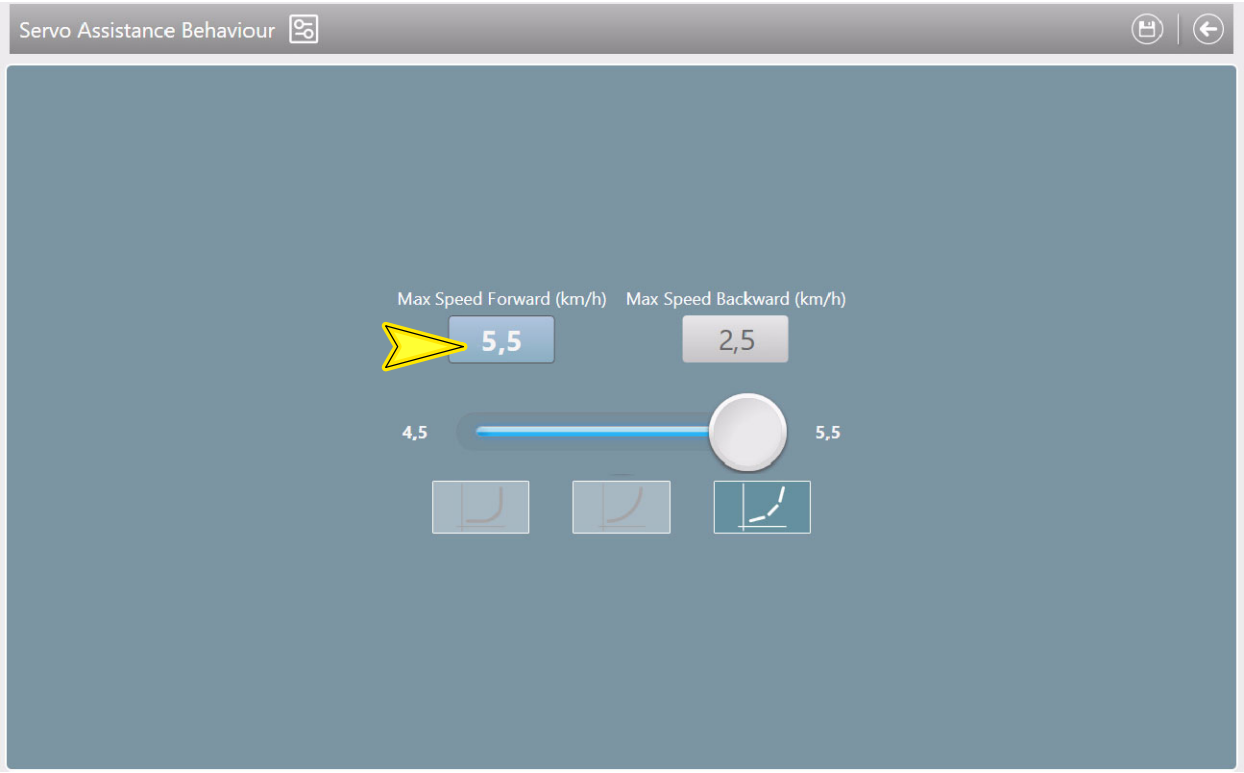
8. Select this option to set the desired driving characteristics for the manual movement of the Mobile system, which is Servo controlled.

   Firstly select the “Max Speed Forward (km/h)” field by pressing on it.

   Select the desired value of the Maximum Speed Forward with the slider, within the range of values allowed:

   4.5 km/h, 5 km/h, 5.5 km/h.

Illustration 2-60
Positioner Setup: Wizard-Servo Assistance Behaviour: Maximun Speed Forward



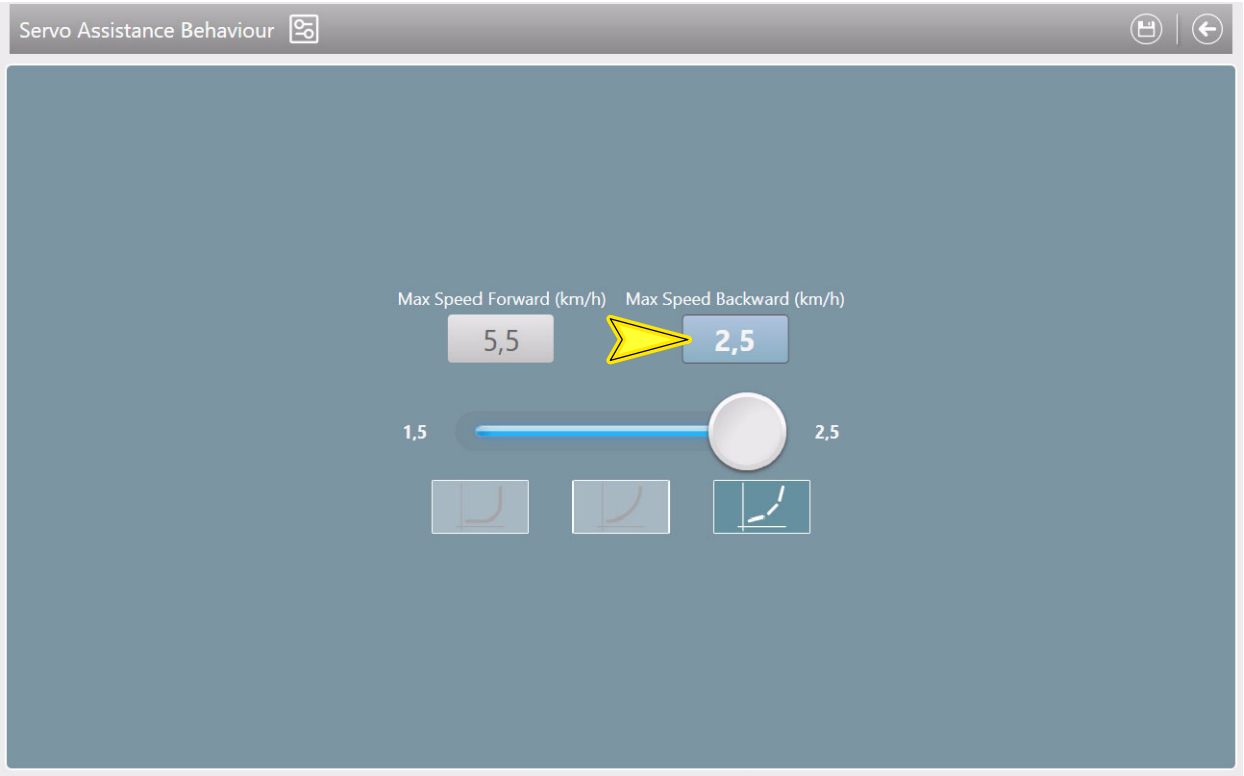
Press on the “Store Data” button, the selected value is automatically modified.

9. Select the “Max Speed Backward (km/h)” field by pressing on it.

   Set the desired value of the Maximum Speed Backward with the slider, within the range of values allowed:

   1.5 km/h, 2 km/h, 2.5 km/h.

Illustration 2-61
Positioner Setup: Wizard-Servo Assistance Behaviour: Maximun Speed Backward



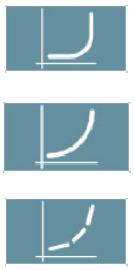
Press the “Store Data” button, the selected value is automatically modified.

10. Select one option of the “Low Speed Drive Response Curves” section.

    This selection is focused on the response of the Unit to short and slow movements operated from the Handlebar (similar to those performed with the Fine Positioning controls on the Head-Assembly).

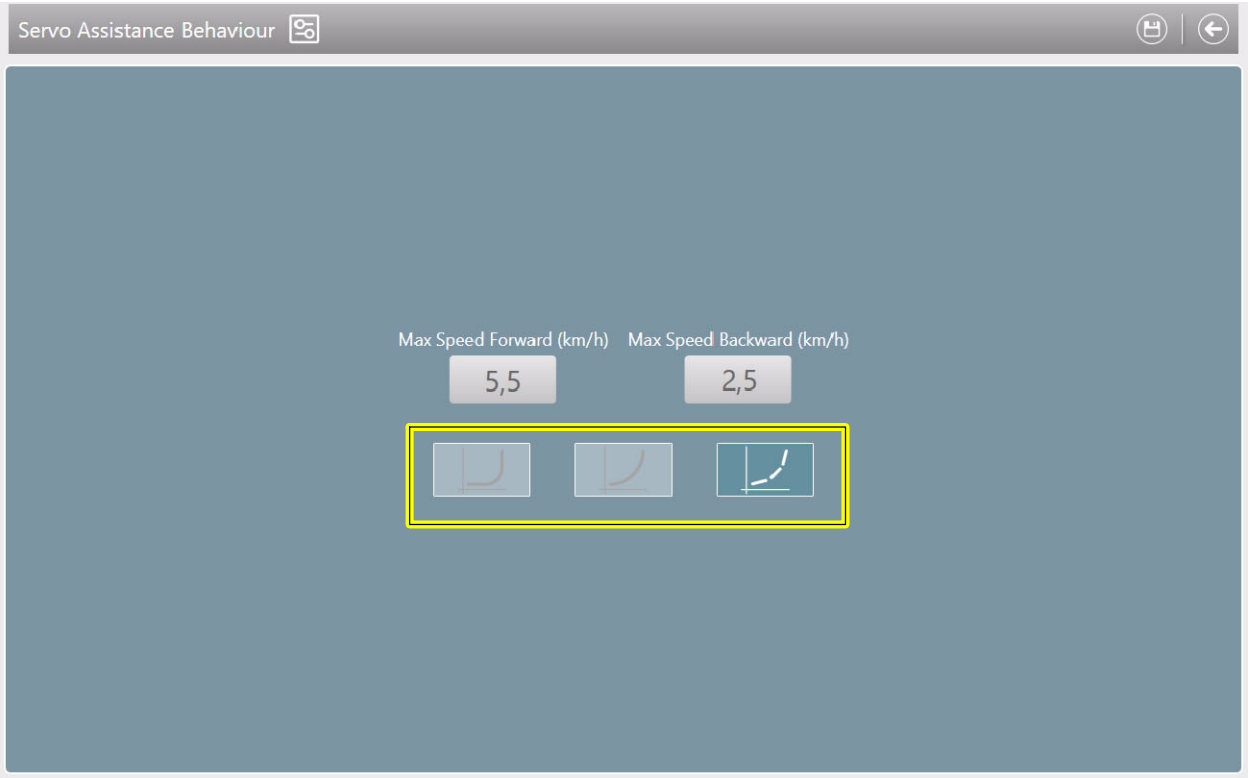
Note ☞ *The effects of each curve are only perceptible at low forces (intended for short distances of about 1 cm.).*

The three types of curves are:



- **Cubic**. Slow movements are performed with heavy driving that increases accuracy over short distances.
- **Quadratic**. The heaviness of the movements is not as pronounced as those of the cubic curve.
- **Straight lines joining**: The driving for slow movements is lighter over small distances but, therefore, more inaccurate.

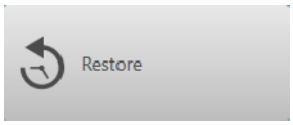
Illustration 2-62
Positioner Setup: Wizard-Servo Assistance Behaviour: Low Speed Drive Response Curves



Press on the “Store Data” button, the selected value is automatically set.

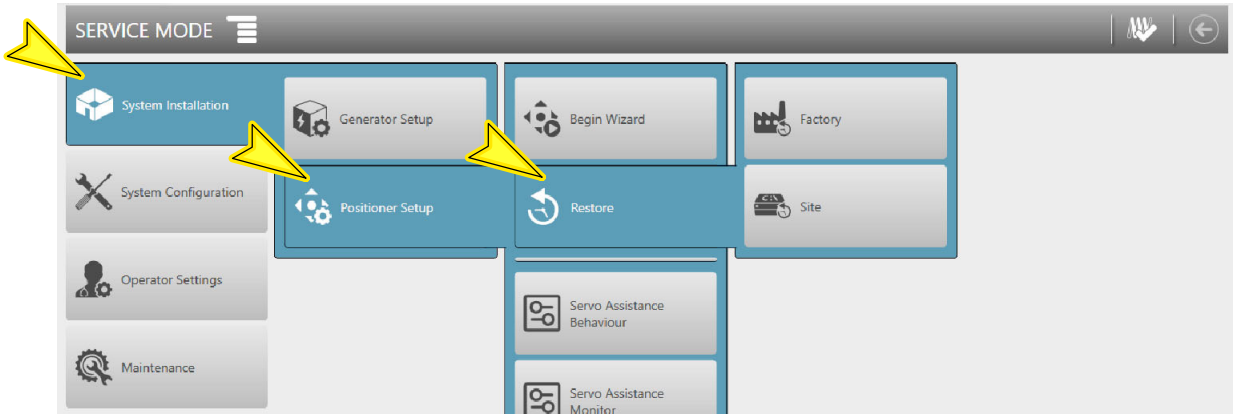
11. Press on the “Back” button to return to the “Positioner Setup” menu.

2.4.1.13 RESTORE POSITIONER SETUP SETTINGS



"Restore" option allows the Service Engineer to restore the Positioner Setup settings.

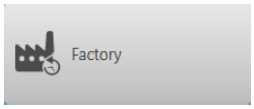
Illustration 2-63
Positioner Setup: Restore



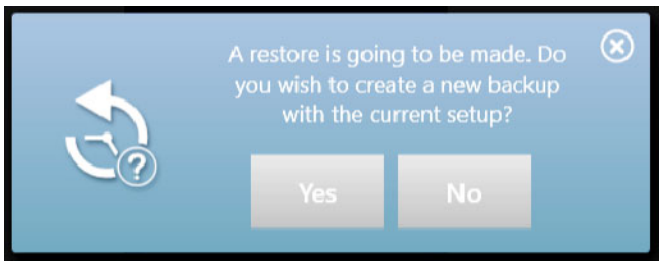
The following restoring options are available:

- "Factory".
- "Site".

▶ **FACTORY:**



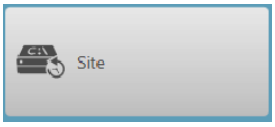
Press on the on "Factory" button to restore the Positioner settings to the Factory defaults for the client; a pop-up message is displayed:



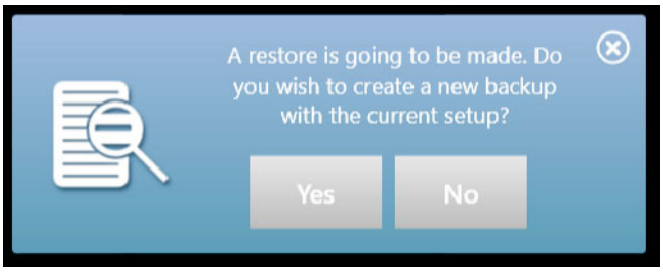
Select "YES" , to create a backup of the current setup before restoring.

Select "NO" to directly proceed to restore the Factory default Positioner Setup.

▶ **SITE:**

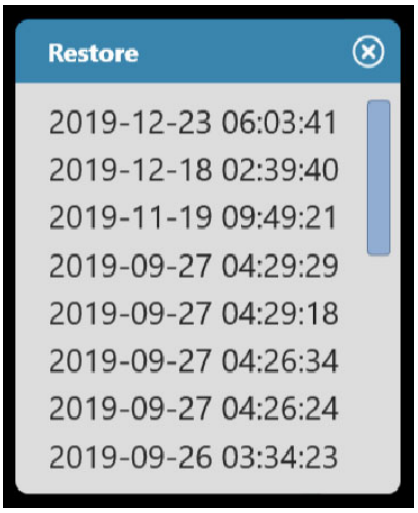


Press on the on “Site” button to restore the Positioner settings from a previous backup file stored in the system. A pop-up message is displayed:

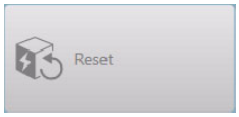


Select “YES” to save a backup of the current data, before restoring the Site Positioner Setup.

Select “NO” to directly access to the Site backup options; a backup list is displayed on the screen, with the date and time of the backup files stored; select the desired file to restore the Positioner Setup.

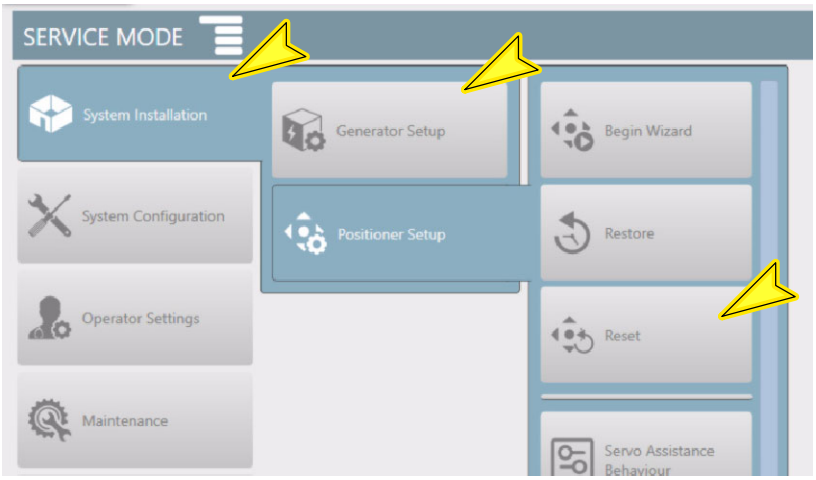


2.4.1.14 RESET (POSITIONER SETUP)



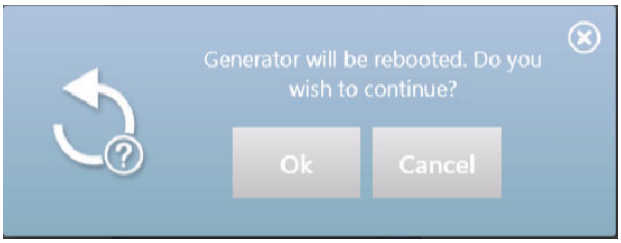
"Reset" option allows the Service Engineer to reboot the Unit and the Positioner Setup settings.

Illustration 2-64
Positioner Setup: Reset



After pressing the "Reset" button, a pop-up window will be displayed to confirm the reboot of the Unit.

Illustration 2-65
Positioner Setup: Reset Confirmation



Confirm the reset action to begin the restart.

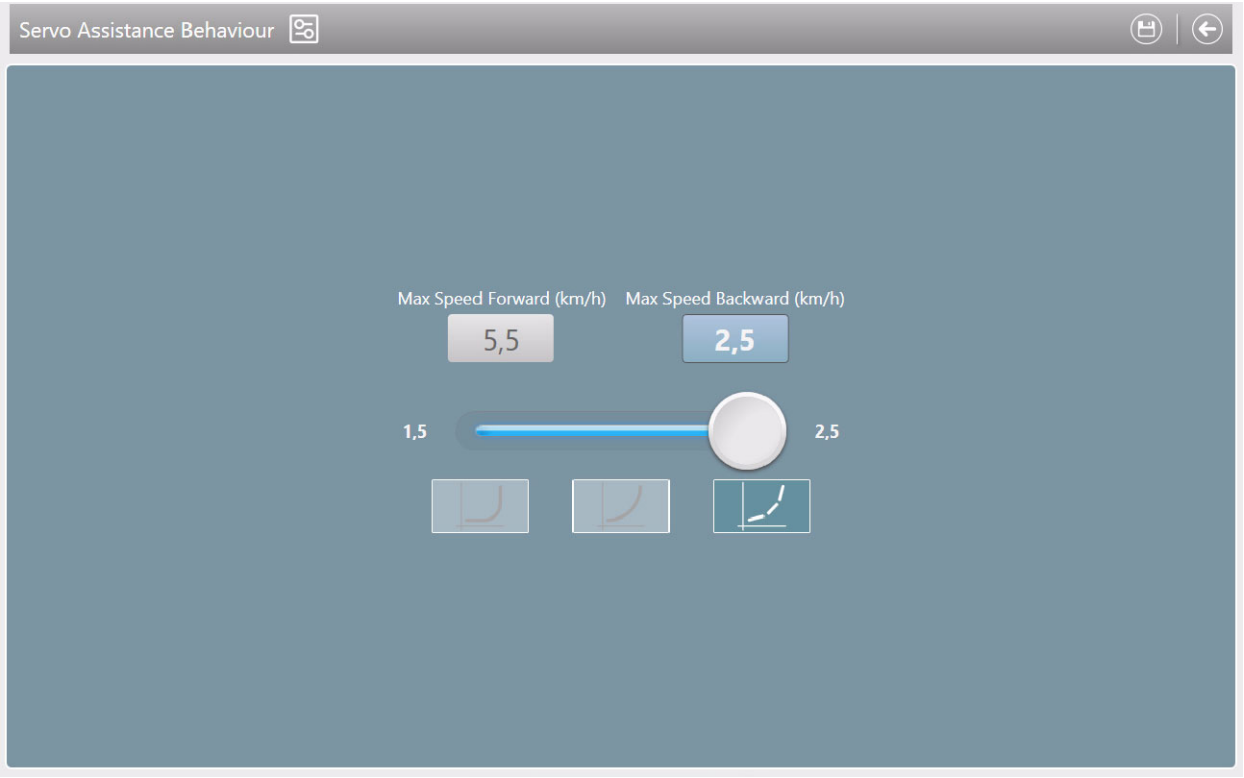
After the Unit reset, it is necessary to log back into the Service Tool, so the console will display the Login Screen again (*refer to Section 2.1.2*).

2.4.1.15 SERVO ASSISTANCE BEHAVIOUR

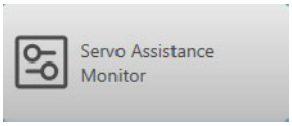
Select this option to set the desired driving characteristics for the manual movement of the Mobile system, which is Servo controlled.

Follow the procedures described fro Servo Assistance Behaviour in section 2.4.1.12 of the Wizard .

Illustration 2-66
Positioner Setup-Servo Assistance Behaviour



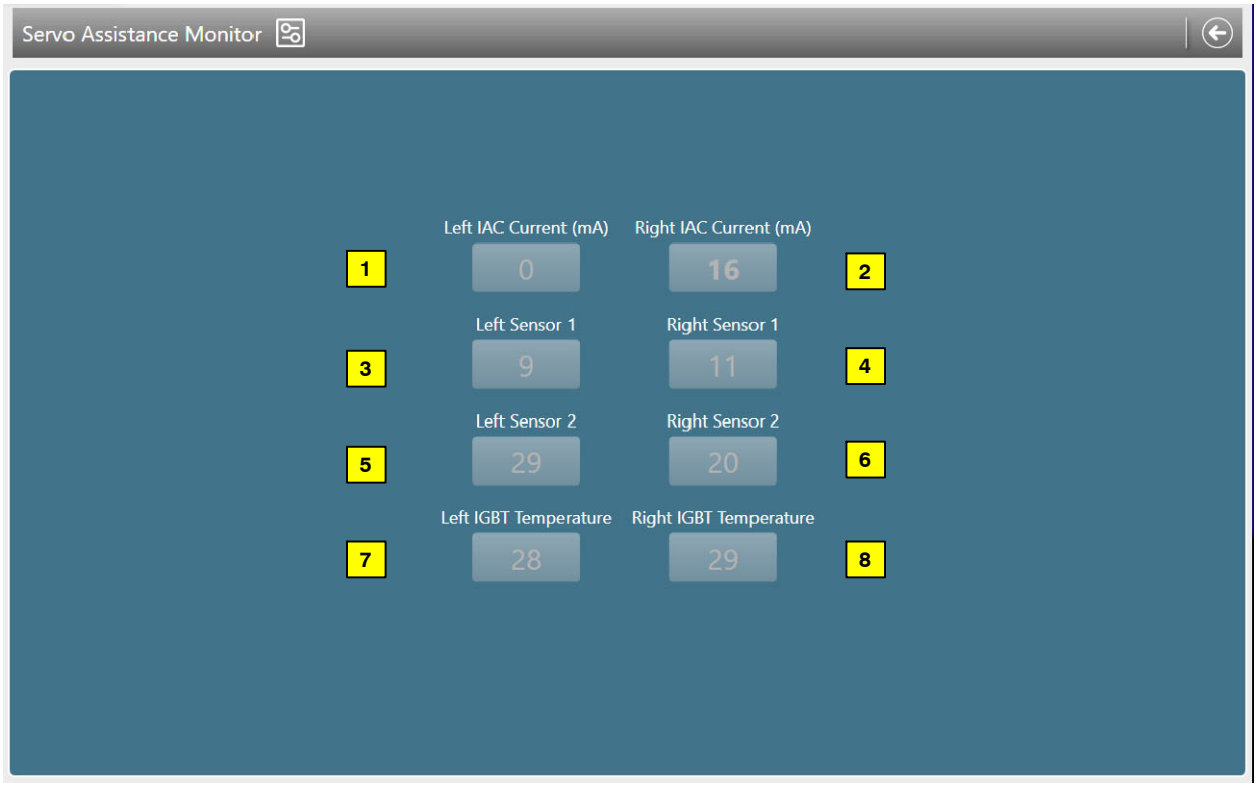
2.4.1.16 SERVO ASSISTANCE MONITOR



The “Servo Assistance Monitor” screen displays information related to the pressure detected by the left and right sensors of the Handlebar.

The information given on each field can be useful for Troubleshooting purposes; if the values displayed are out of the reference values, perform the Wizard procedure described in section 2.4.1.12.

Illustration 2-67
Positioner Setup: Servo Assistance Monitor



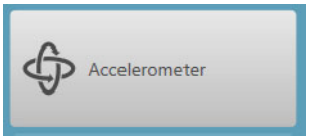
1. Left Motor Current
2. Right Motor Current
3. Left Sensor 1
4. Right Sensor 1
5. Left Sensor 2
6. Right Sensor 2
7. Left IGBT Temperature
8. Right IGBT Temperature

Note ☞ *Left and Right sensors-1, display the values obtained when the Handlebar is pushed forwards, to the left or to the right.*

Left and Right sensors-2, display the values obtained when the Handlebar is pulled backwards, to the left or to the right.

REFERENCE VALUES		
FIELDS	LEFT	RIGHT
Motor Current	≤100 mA	
Sensors-1	≤300	
Sensors-2		
IGBT Temperature	≤100	

2.4.1.17 ACCELEROMETER



The “Accelerometer” is used to calibrate the values for the roll rotation angle and the pitch rotation angle of the Head-Assembly; check that all the values are within the range.

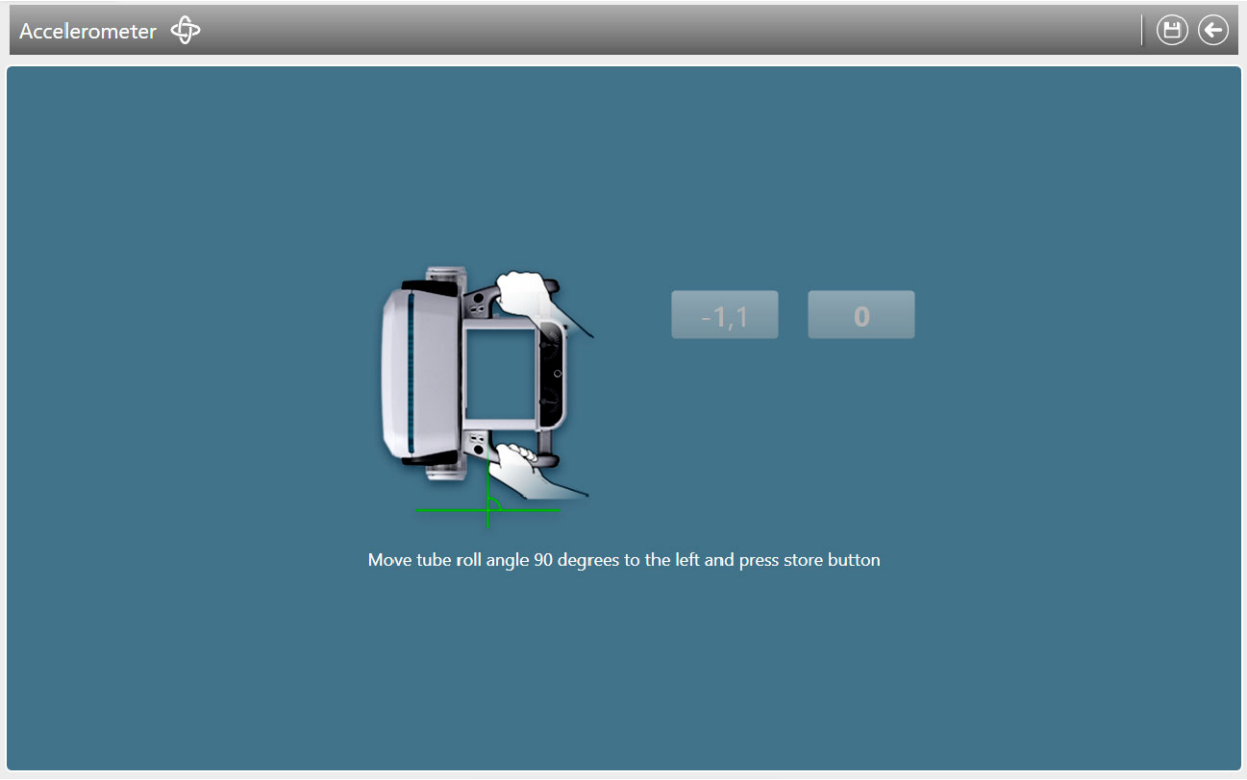
1. Place the Head-Assembly with the X-ray beam perpendicular to the floor, as indicated in the next screen, using the handles.

Illustration 2-68
Positioner Setup: Accelerometer 0º-0º

2. Press on the “Store Data” button.

3. Turn the Head-Assembly, –90º counterclockwise, i.e. Roll Angle.

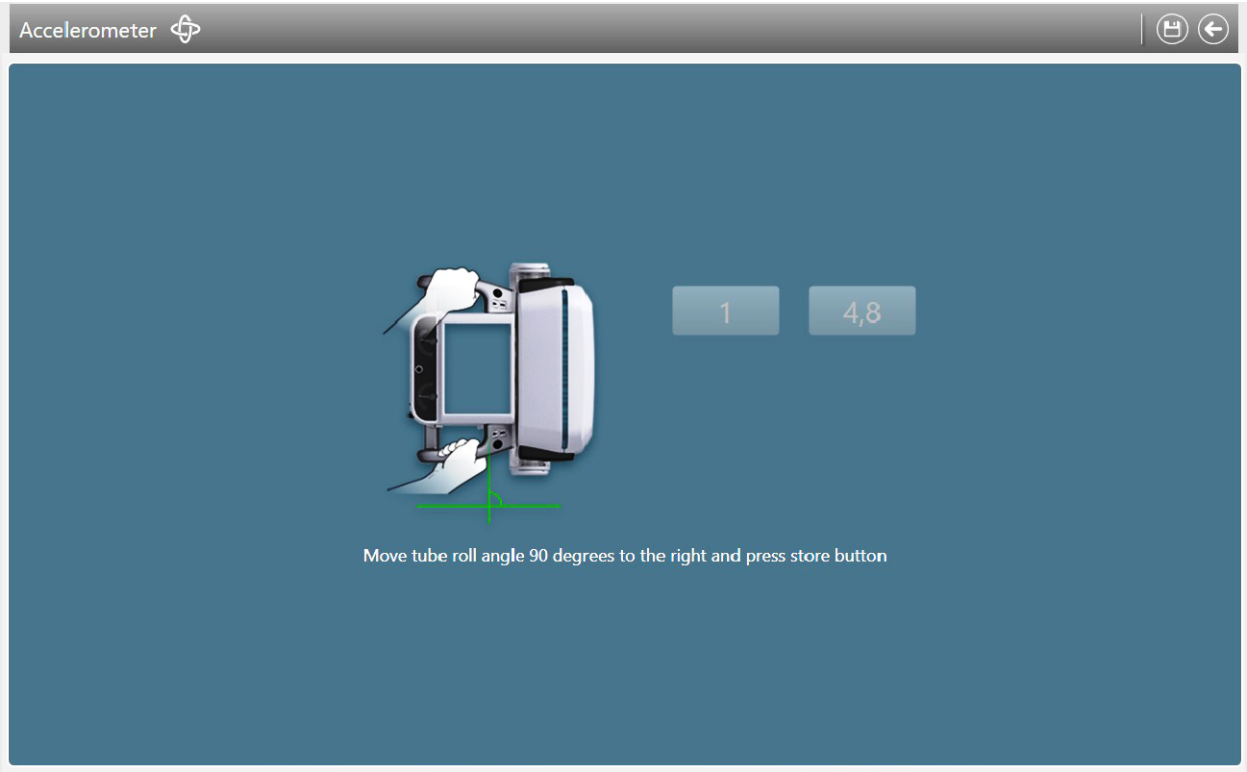
Illustration 2-69
Positioner Setup: Accelerometer, Roll Angle -90º



4. Press “Store Data”.

5. Turn the Head-Assembly, +90º clockwise; i.e. Roll Angle.

Illustration 2-70
Positioner Setup: Accelerometer, Roll Angle +90º



6. Press “Store Data”.

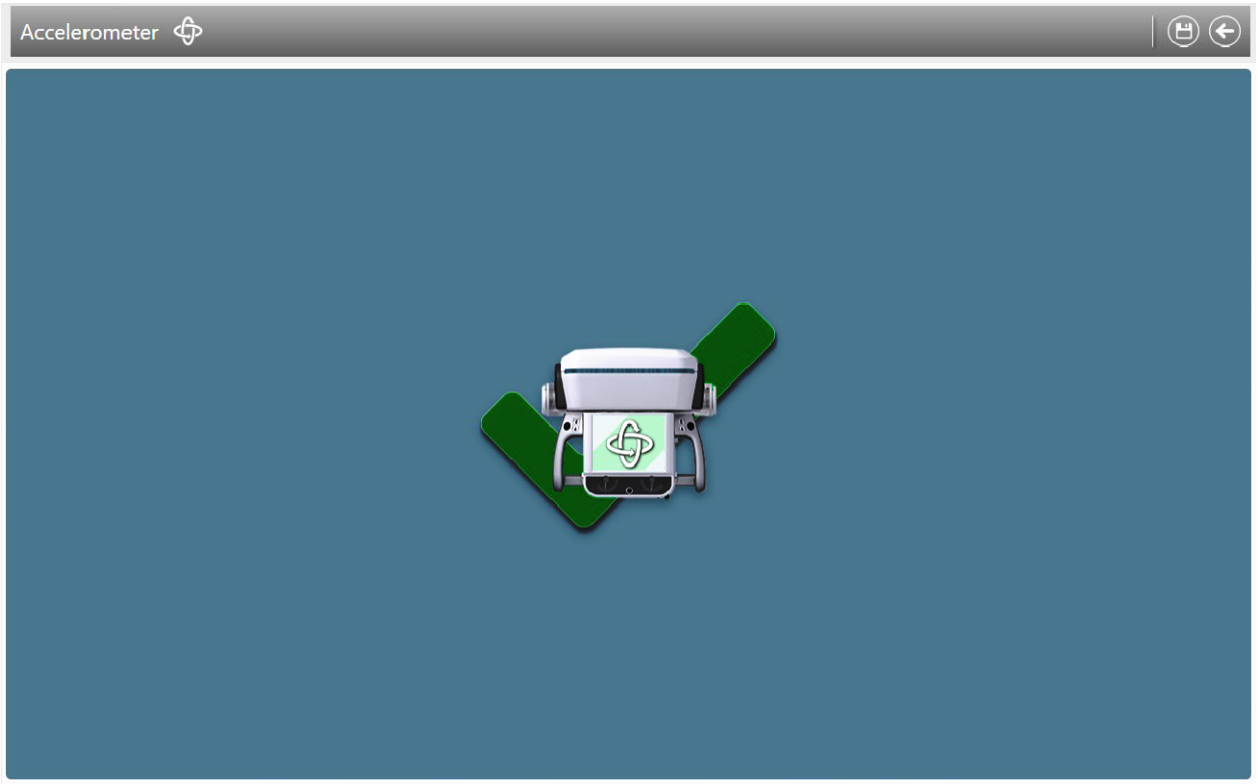
7. Turn the Head-Assembly 90º to the front, on its Pitch Angle, as shown in the following Illustration.

Illustration 2-71
Positioner Setup: Accelerometer, Pitch Angle +90º

8. Press “Store Data”.

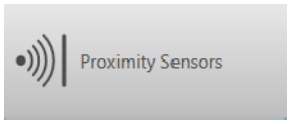
9. It is displayed the screen of the Accelerometer Calibration done.

Illustration 2-72
Positioner Setup: Accelerometer Calibration done.



10. Press on the “Back” button to return to the “Positioner Setup” menu.

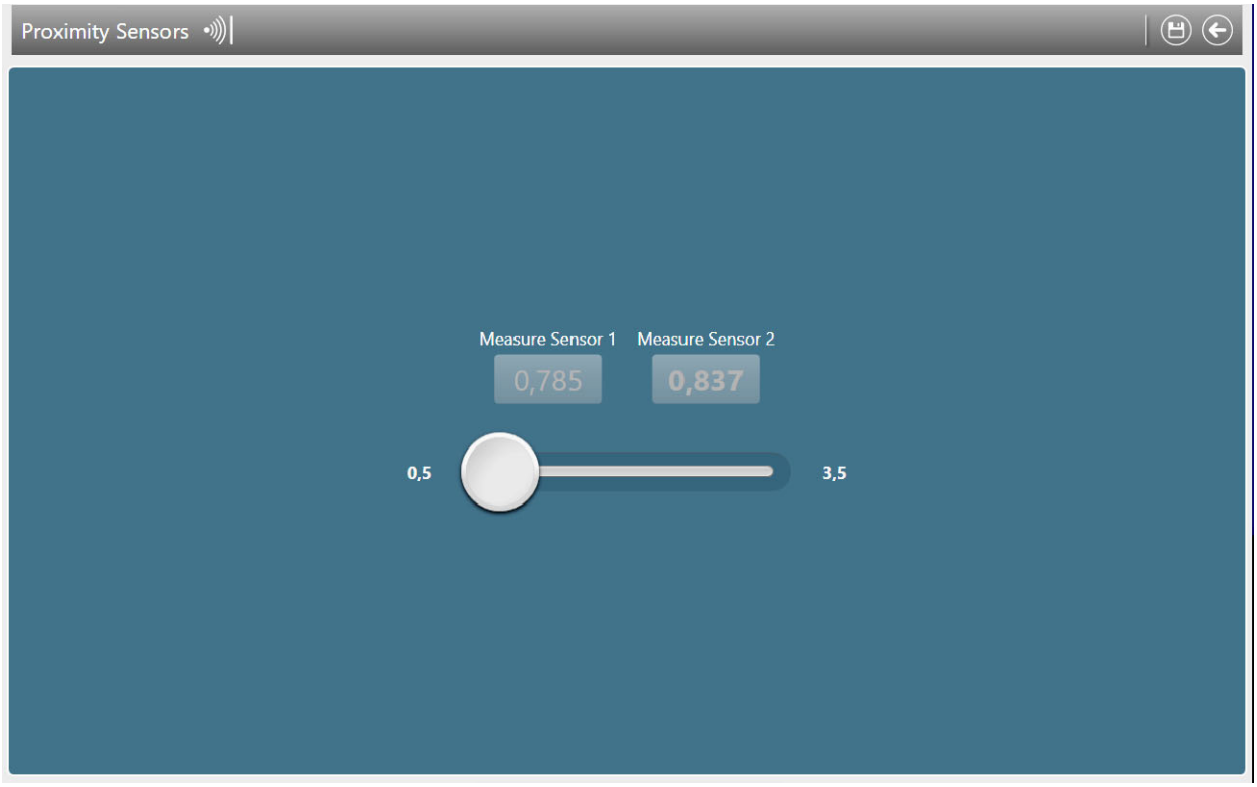
2.4.1.18 PROXIMITY SENSORS



The Proximity Sensors, located under the Front Bumper, reduce the system speed when detecting an obstacle at the configured distance; the Status Light Indicator blinks white (2.5 blinks/second, approx.). The system can emit an acoustic signal (if configured).

Select this option to configure the distance at which the system will detect an obstacle.

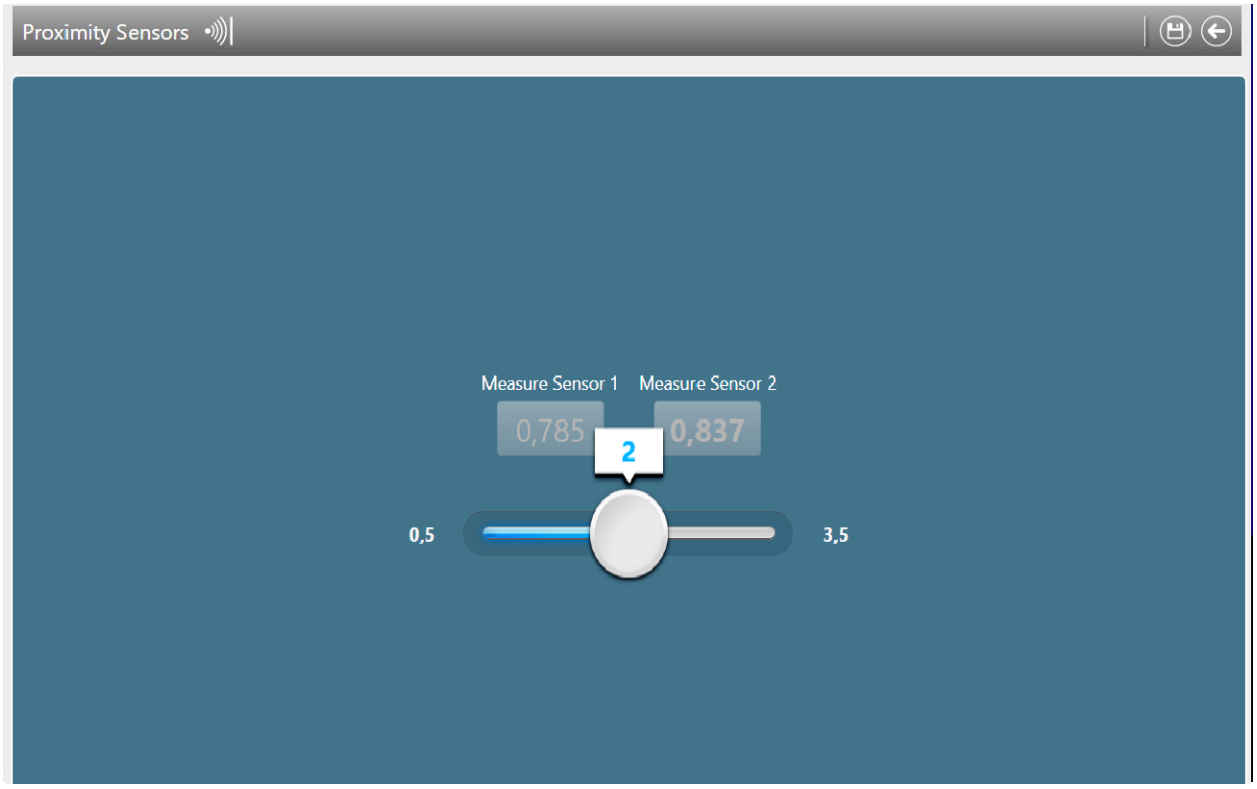
Illustration 2-73
Positioner Setup: Proximity Sensors



1. Use the slider to select the desired distance, within the range of values allowed:

   From 0.5 m to 3.5 m in 0.5 m steps.

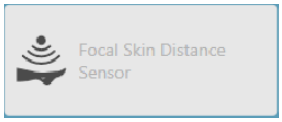
Illustration 2-74
Positioner Setup: Proximity Sensors



2. Press on the “Store Data” button to save the selection.

3. Press the “Back” button to return to the “Positioner Setup” menu.

2.4.1.19 FOCAL SKIN DISTANCE SENSOR



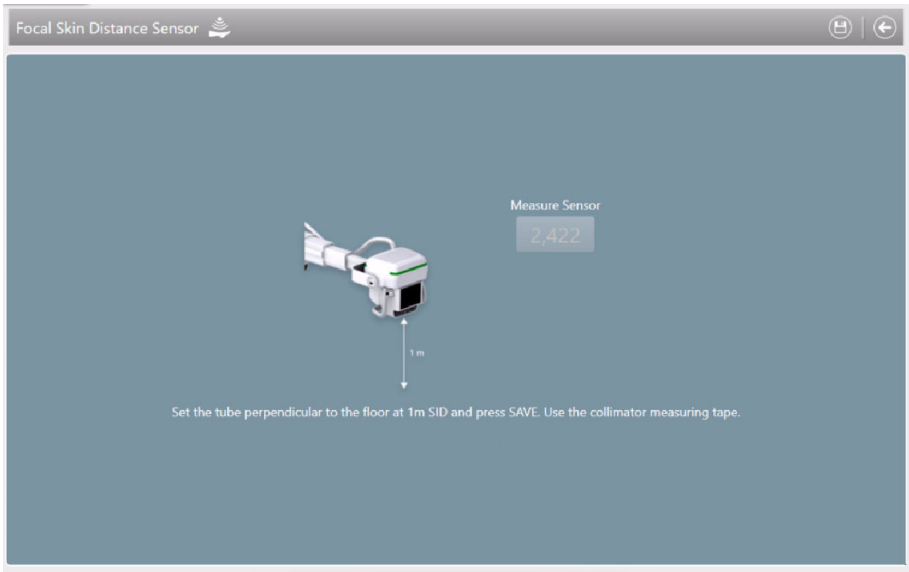
The Focal Skin Distance Sensor, located under the Collimator Controls, calculates the Focus to skin distance.

It is mandatory to calibrate and check the proper functioning of the FSD Sensor, whenever the Unit is equipped with the eDAP/eDOSE functionalities for Skin Dose Estimation.

Illustration 2-75
Positioner Setup: Focal Skin Distance Sensor - Location of the Sensor

1. To calibrate this sensor, place the Head-Assembly perpendicular to the floor at a SID distance of 1 meter. Use the measuring tape on the Collimator to set this distance.

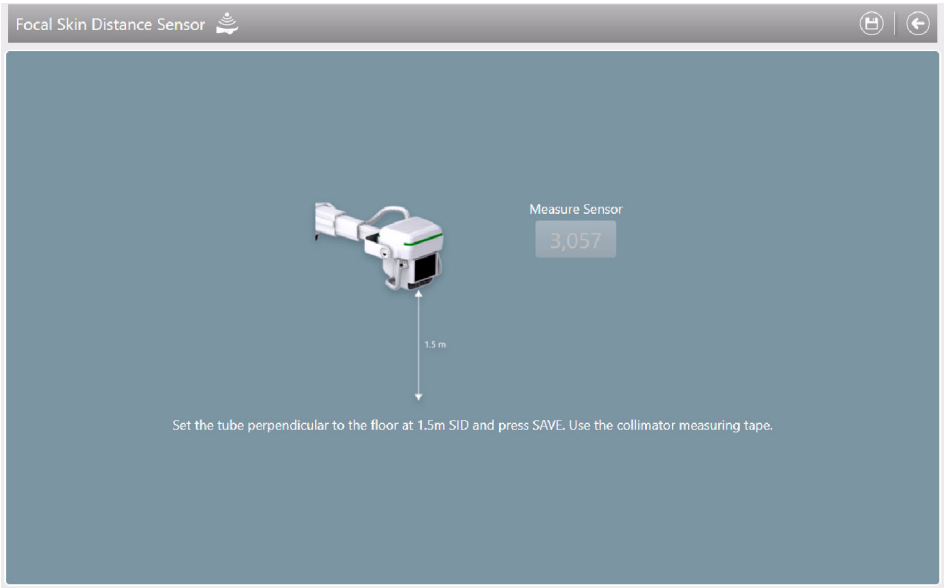
Illustration 2-76
Positioner Setup: Focal Skin Distance Sensor Calibration (Step 1)



2. When the distance indicated is set, press on the “Store Data” button.

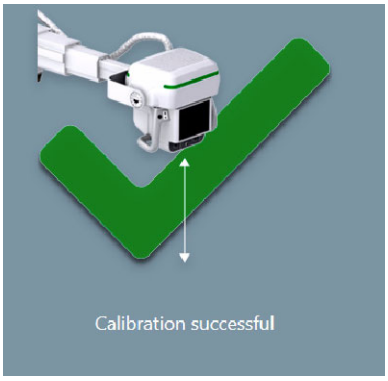
3. A new window will be displayed with instructions to repeat the process but this time with a SID distance of 1.5 meters. Press the “Store Data” button again when finished.

Illustration 2-77
Positioner Setup: Focal Skin Distance Sensor Calibration (Step 2)



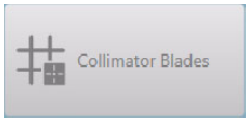
4. When the process is finished, the following successful calibration message is displayed.

Illustration 2-78
Positioner Setup: Focal Skin Distance Sensor Calibration – Successful Message



5. Press on the “Back” button to return to the “Positioner Setup” menu.

2.4.1.20 COLLIMATOR BLADES



Collimator Blades are used to calibrate the aperture of the Collimator. Its configuration consists of an eight point Calibration: 0x0, 13x13, 18x18, 24x24, 30x30, 35x35, 40x40 and 43x43.

It is mandatory to calibrate and check the proper functioning of the Collimator Blades, whenever the Unit is equipped with the eDAP functionality. Otherwise, this calibration is not necessary.

To perform this calibration, follow the instructions on the screen:

1. Firstly, set the Collimator knobs to 0x0 cm, in order to fully close the cross and long blades. Then, press the “Store Data” button.

Illustration 2-79
Positioner Setup: Collimator Blades - Calibration (0x0)

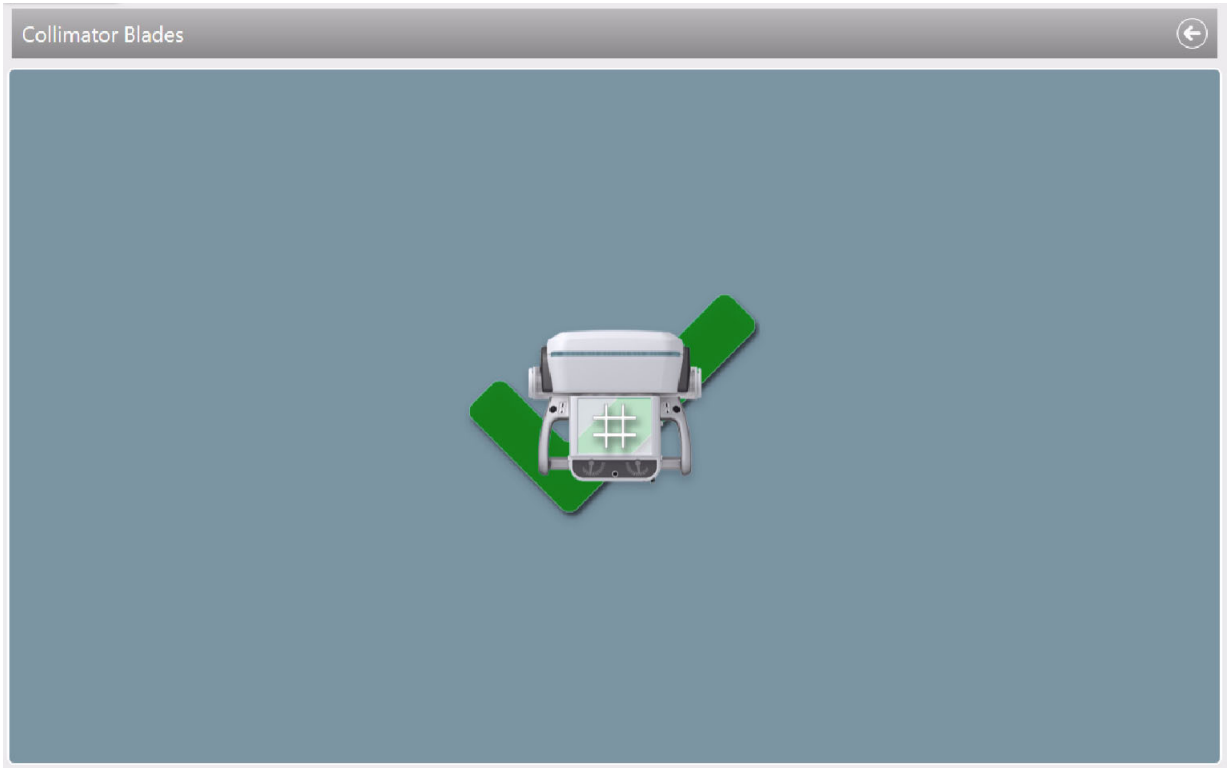
2. Next, set the Collimator knobs to 13x13 cm. at FFD 100 cm. as indicated on the screen and press the “Store Data” button.

Illustration 2-80
Positioner Setup: Collimator Blades - Calibration (13x13)

3. Repeat consecutively the same process, as indicated on the screen, for the 18x18, 24x24, 30x30, 35x35, 40x40 and 43x43 cm field sizes.

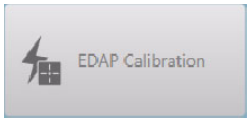
4. Once the data has been saved after the last Collimator opening setting (43x43 cm), the following successful calibration icon is displayed.

Illustration 2-81
Positioner Setup: Collimator Blades – Successful Calibration



5. Press on the “Back” button to return to the “Positioner Setup” menu.

2.4.1.21 EDAP CALIBRATION



This functionality calculates the Dose and DAP values based on an equation where the radiographic parameters, the collimator aperture, the FSD sensor value and the actual Unit values are used as input elements. For functionality calibration, dose measurements will be taken for each of the collimator filters.

The eDAP/eDOSE functionality must be enabled by license and the dose estimation type selection between eDAP (*mGy*cm²*), eDOSE (*mGy*) or both, must be set during the installation of the Unit.

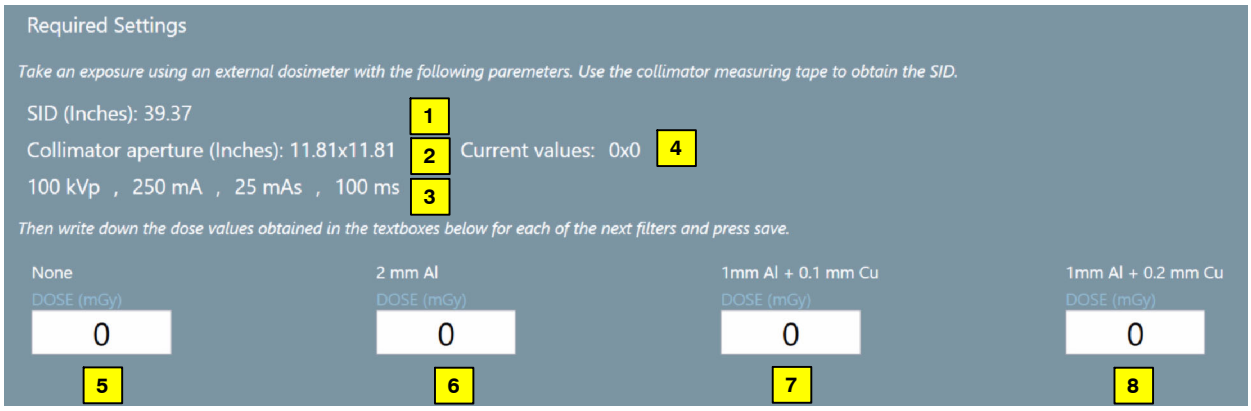
Note ☞ *By license, Estimated Dose and Real Dose cannot be provided in the same Unit (refer to Section 2.4.4.3).*

Note ☞ *This calibration window will not be available if the eDAP/eDOSE functionalities are not activated in the "Positioners" configuration window in the System Configuration Menu (refer to Section 2.4.2.3).*

Note ☞ *To use the eDAP/eDOSE functionality the Collimator Blades of the Collimator must have been previously calibrated. Refer to Section 2.4.1.20 Collimator Blades.*

Note ☞ *To use the eDOSE functionality the Unit must be equipped with the Focus-Skin Distance Sensor and it must have been previously calibrated. Refer to Section 2.4.1.19 Focal Skin Distance Sensor.*

Illustration 2-82
Positioner Setup: EDAP Calibration - Calibration Window



1. Focal Skin Distance Value
2. Collimator Aperture Value (To be set)
3. Radiographic Parameters (To be set)
4. Collimator Aperture Current Value
5. Measured Dose Value without filter
6. Measured Dose Value (2 mm Al filter)
7. Measured Dose Value (1 mm Al +0.1 mm Cu filter)
8. Measured Dose Value (1 mm Al +0.2 mm Cu filter)

To perform the eDAP calibration it is necessary to take several exposures using a external Dosimeter accordingly the parameters displayed on this screen to be set. Proceed as follows:

1. Firstly, place a Dosimeter on the floor or on a flat surface accessible by the Unit.

Note ☞ *The Dosimeter must be located in the center of the Collimator projection.*

2. Set the Head-Assembly at 0° pointing at the Dosimeter, and place at a distance of 1 meter (39″) from the Dosimeter surface. Use the tape measure on the Collimator to set this distance.

Note ☞ *The one meter measurement taken with the tape measure should ALWAYS be the reference measurement for this calibration.*

The Focal-Skin Distance value display on the screen can be used ONLY as a guide for approaching the SID distance. Please note that the Focal-Skin Distance sensor is located at some distance from the center of the Collimator. The measurement displayed by this sensor may be taking the floor as a reference, instead of the Dosimeter surface.

3. Use the Collimator Knobs to set the Blades aperture according to the specified field size displayed on the screen. The value of the selected Collimator aperture is displayed in the “Current values” field.

4. Note down the Radiographic Parameters displayed on this screen (*refer to Illustration 2-82*).

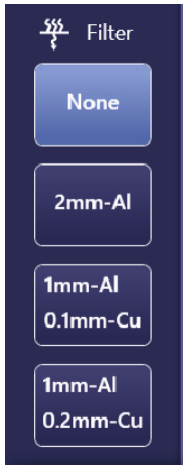
5. Exit the EDAP Calibration window and exit the Service Tool / Service Mode to access the Head-Assembly Control Console in order to perform exposures and modify the Collimator Filters selection.

Note ☞ *Alternatively, it is possible to perform exposures from the “Exposure Scope” window within the Service Tool / Service Mode in: System Installation > Generator Setup > Exposure Scope (refer to Section 2.4.1.9).*

6. Set the radiographic parameters noted above in the Operator Control Console.

7. Select “None” in the Collimator filter selection.

Illustration 2-83
Positioner Setup: EDAP Calibration – Filter Selection in the Operator Control Console



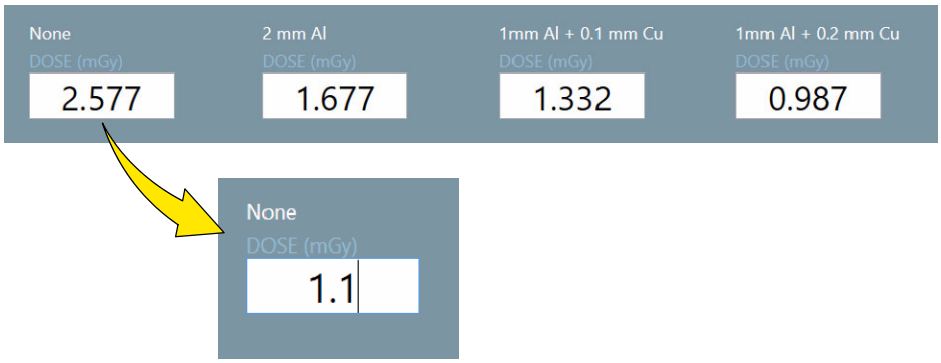
8. Perform an exposure and note down the dose value (mGy) measured by the Dosimeter.

9. Repeat the process (steps 6. to 8.) by selecting each of the other filters (“2 mm Al”, “1 mm Al + 0.1 mm Cu” and “1 mm Al + 0.2 mm Cu”).

10. Once all measurements with the four filter options have been noted, re-enter the EDAP Calibration window of the Service Tool / Service Mode.

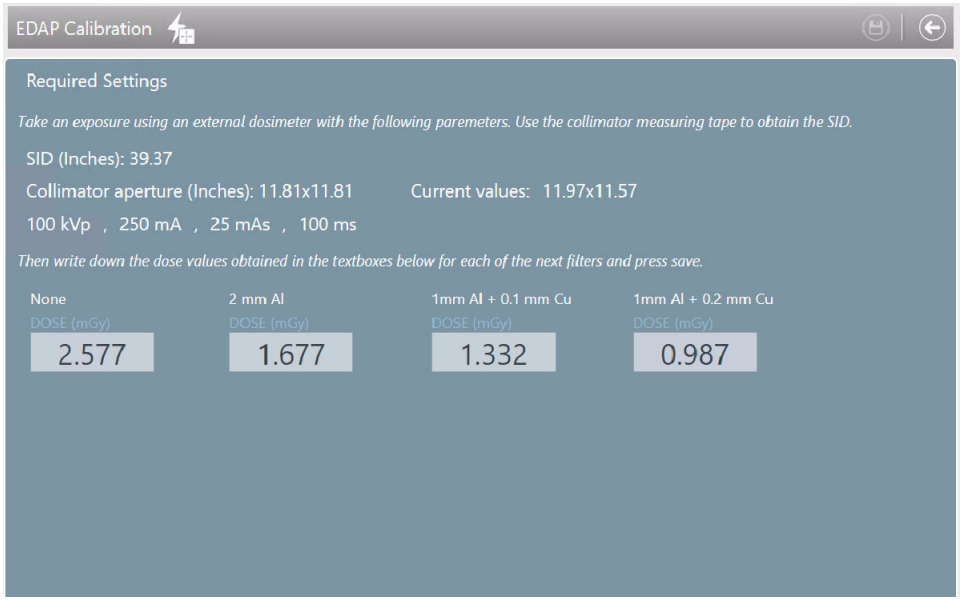
11. Use a keyboard to enter all measured dose values in each of the fields corresponding to each filter in the calibration window.

Illustration 2-84
Positioner Setup: EDAP Calibration – Entering Measured Dose Value



12. Press the “Store Data” button . All fields (including the “Store Data” button) will be grayed out and cannot be modified without leaving this window.

Illustration 2-85
Positioner Setup: EDAP Calibration - Saving Calibration Values



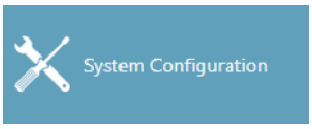
If any of the dose values entered are outside the preset range for that filter, an error message will be displayed indicating this and the calibration values will not be saved until a correct value is entered.

In this case, press the “Accept” button in the Notifications window, exit the EDAP Calibration window and enter again to set the correct values.

Illustration 2-86
Positioner Setup: EDAP Calibration - Range Error Message

13. Once the calibration is completed, press the “Back” button to return to the “Positioner Setup” menu.

2.4.2 SYSTEM CONFIGURATION

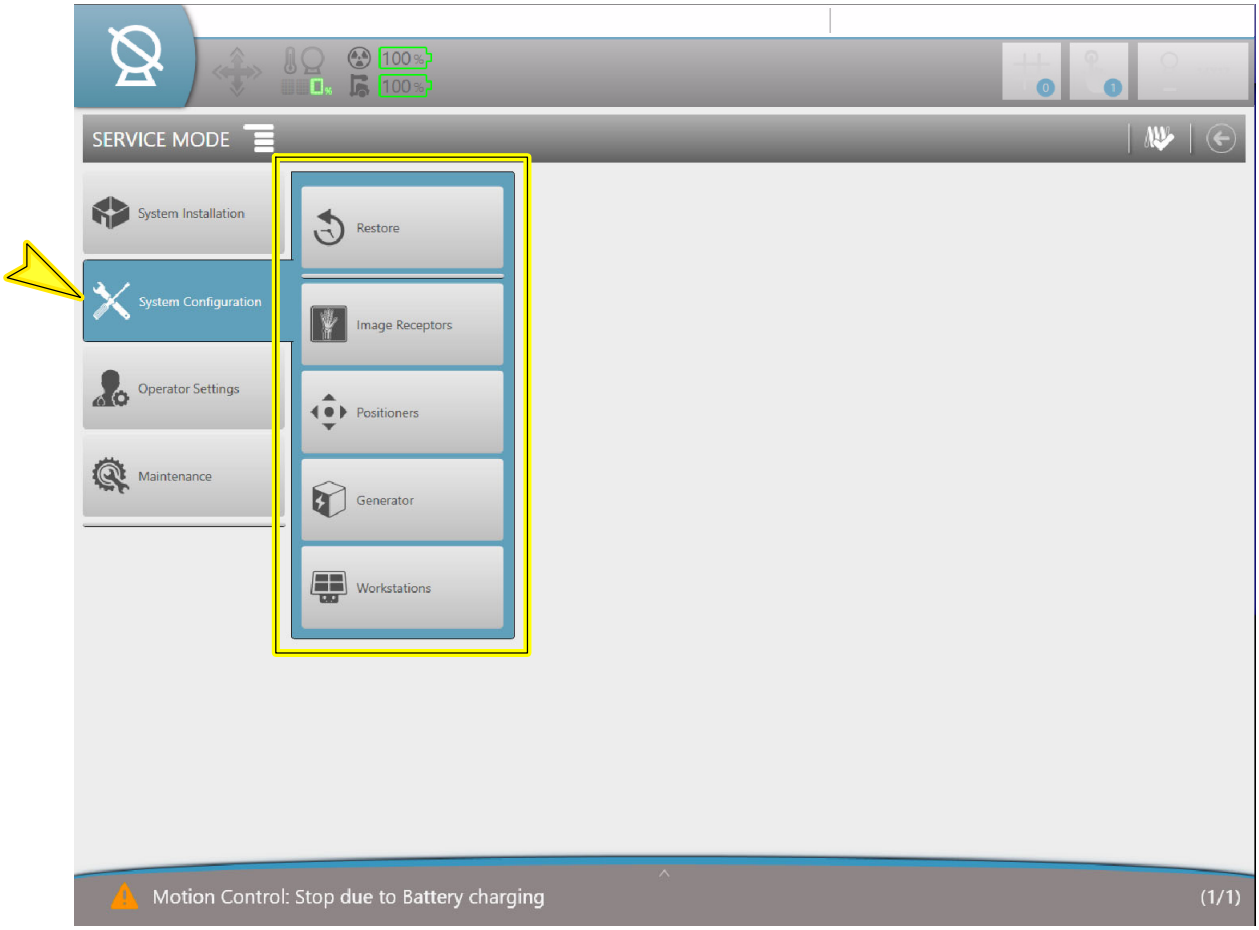


Select the “System Configuration” in order to select the different components of the equipment (Receptors, Positioners) and to perform other System Configuration procedures (Workstations, exposure Switches).

Each configuration procedure can be performed separately, without a pre-established order.

Note ☞ *It is neccessary to set all these configuration menu options before starting the calibration procedure in “System Installation”.*

Illustration 2-87
System Configuration



The following options are displayed for System Configuration menu:

- "Restore", *refer to section 2.4.2.1.*
- "Image Receptors, *refer to section 2.4.2.2.*
- "Positioners", *refer to section 2.4.2.3.*
- "Generator", *refer to section 2.4.2.4.*
- "Workstations", *refer to section 2.4.2.5.*

The "System Configuration" screens have some common controls:

Note ☞ *For further information about icons, refer to section 2.2*.

ADD:
Press to add a new item to the list.

STORE: Press to apply the changes. This icon becomes active when any field of the screen is modified.

RESTORE DATA: Press to load the client's factory configuration data. This icon becomes active when any field of the screen is modified and saved.

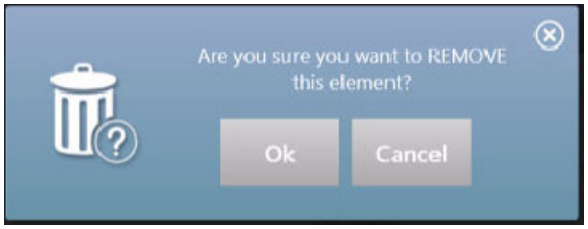
BACK: Press to leave the current screen. A confirmation message will be displayed if the changes have not been previously saved.

EDIT: Press to modify the configuration of the selected item. The gray shaded fields become highlighted to indicate they can be edited.

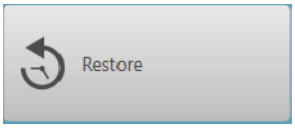
DELETE: Press to delete the selected item from the list.

Whenever you modify or delete any of the configurable elements, a pop-up window will appear asking for confirmation of the requested action.

Illustration 2-88
System Configuration Confirmation Window



2.4.2.1 RESTORE SYSTEM CONFIGURATION SETTINGS



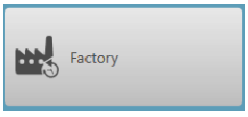
"Restore" option allows the Service Engineer to restore the System Configuration.

Illustration 2-89
System Configuration: Restore

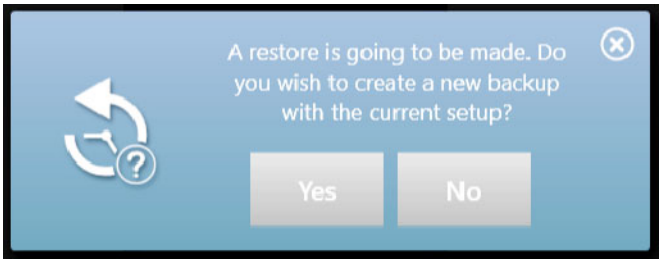
The following restoring options are available:

- "Factory".
- "Site".

▶ **FACTORY:**



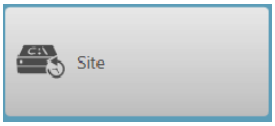
Press on the "Factory" button to restore the Positioner settings to the Factory defaults for the client; a pop-up message is displayed:



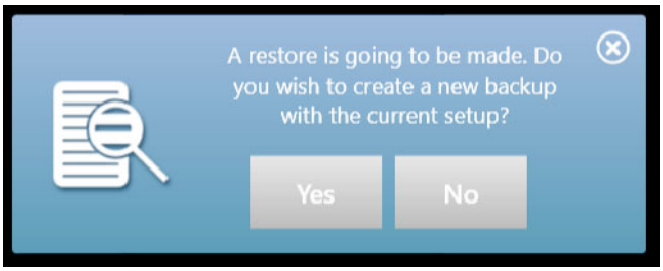
Select "YES" , to create a backup of the current setup before restoring.

Select "NO" to directly proceed to restore the Factory default System Configuration.

▶ **SITE:**

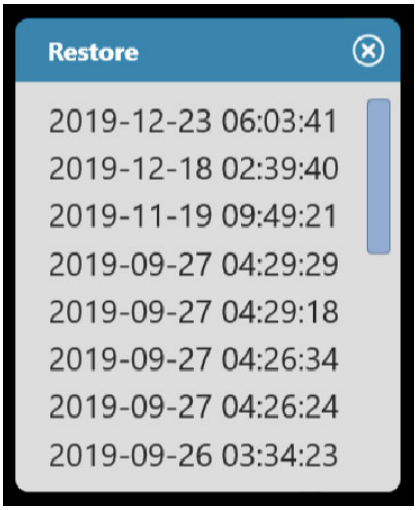


Press on the “Site” button to restore the Positioner settings from a previous backup file stored in the system. A pop-up message is displayed:

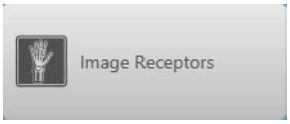


Select “YES” to save a backup of the current data, before restoring the Site System Configuration.

Select “NO” to directly access to the Site backup options; a backup list is displayed on the screen, with the date and time of the backup files stored; select the desired file to restore the System Configuration.



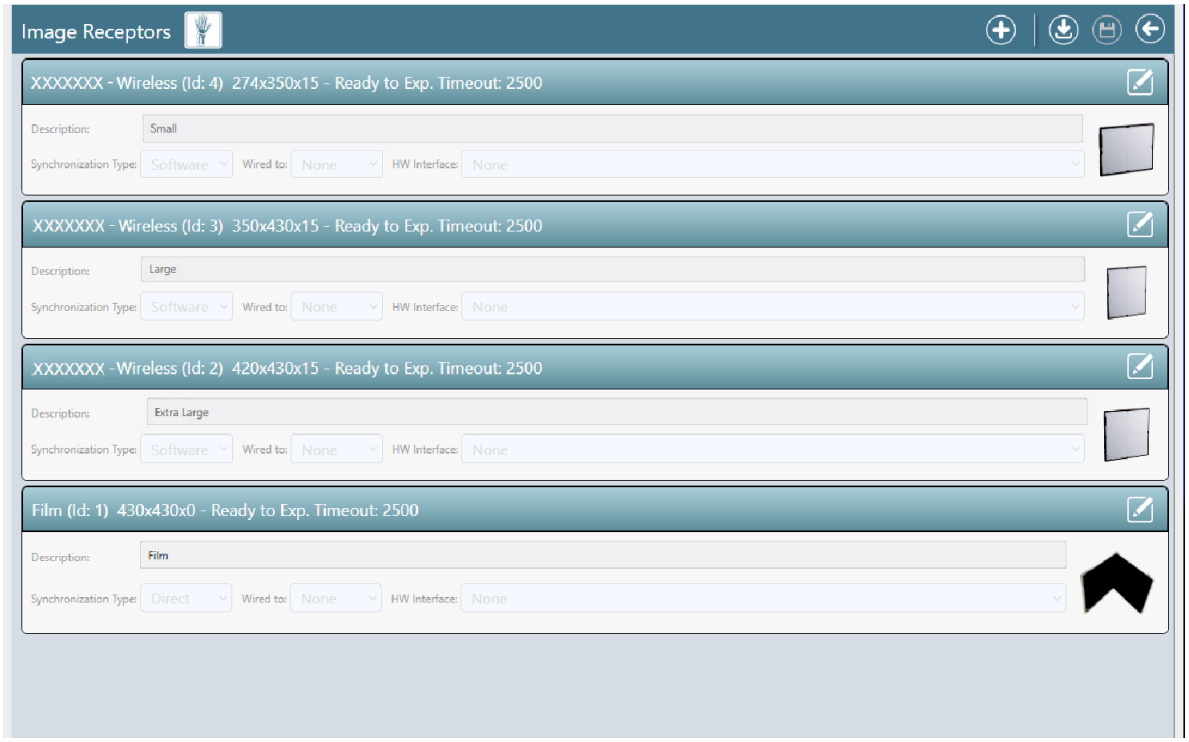
2.4.2.2 IMAGE RECEPTORS



The “Image Receptors” screen shows the receptor options for the system.

Apart from the factory settings, it would be possible to add a new receptor or to modify the values of the current receptors on the list.

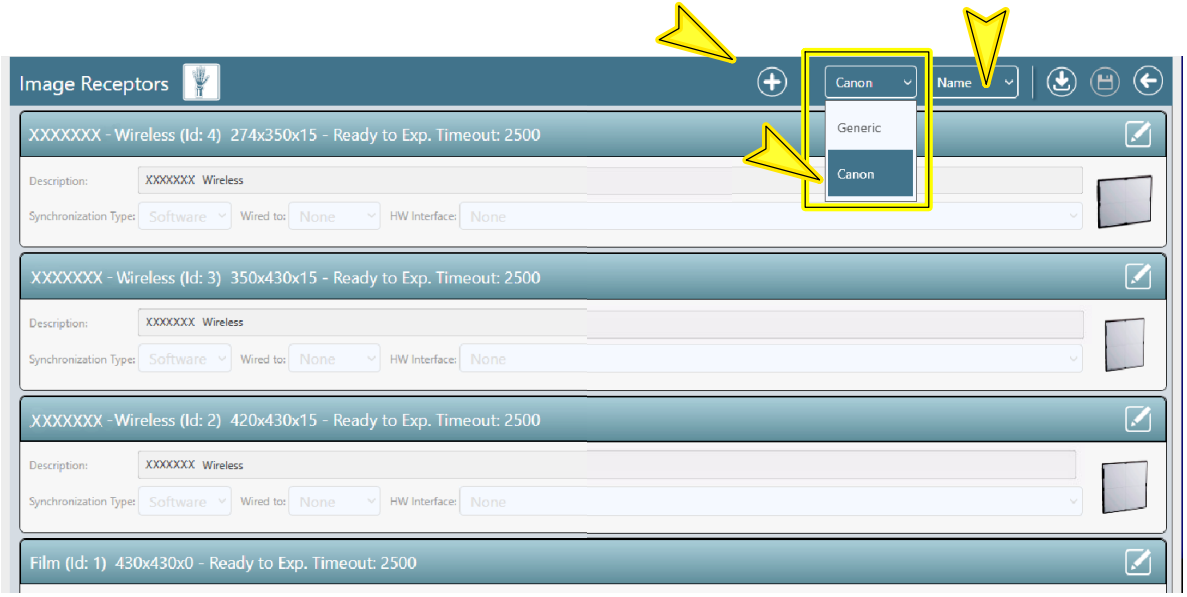
Illustration 2-90
System Configuration: Image Receptors



Note ☞ *The system can have up to a maximum of 5 registered Image Receptors.*

For adding a new receptor, press the “Add” button *(“+” icon)*; then, select the Manufacturer and Model Name among the available options.

Illustration 2-91
System Configuration: Image Receptors–Adding a New Receptor



Note ☞ *Although a Receptor in Direct Mode is factory-set, in case it is necessary to create it again, press the “Add” button, then select “Generic” (Manufacturer) and finally “Film” (Model).*

Once the Receptor is selected, it will be added to the list with an **Id** number and the Model Name as a **Description** to facilitate its identification.

Illustration 2-92
System Configuration: Image Receptors–Newly Created Receptor

An Image Receptor can be deleted by using the *Erase* button (“*Trash*” icon).

As long as a Receptor is linked to a Workstation at *Workstations* window, the Erase button will not be displayed.

In this case, to delete the Receptor, the Workstation involved must be deleted first or the linked Receptor must be replaced by another one (*refer to Section 2.4.2.5 - Workstations*).

Press the "*Edit*" button to configure the Receptor:

- **Description**: Modify the default description.

- **Synchronization Type**:

  - **Direct**: There is no connection with the Receptor. Confirmation signal is not sent before the exposure.

    This option is intended for receptors in Direct Mode (*Generic -> Film*), in order to be linked to a newly created "Free" Workstation in 'Workstations' menu (*refer to Section 2.4.2.5*).

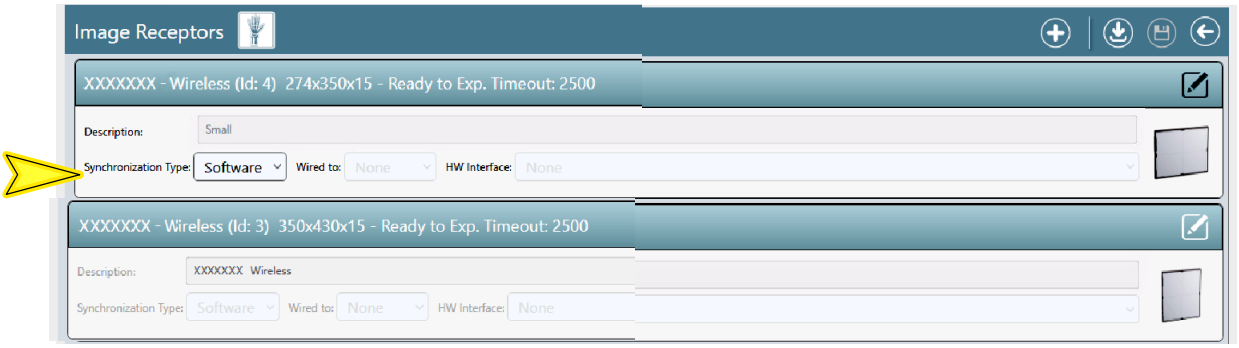
  - **Software**: Receptor sends the confirmation signal via software. It is not connected to the Generator.

    This option is intended for digital detectors.

  - **Standard Hardwired**:Receptor is connected to the Generator.

  - **Dynamic Hardwired**: *[Not Applicable]*

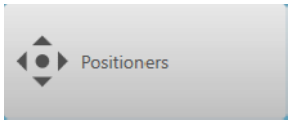
Illustration 2-93
System Configuration: Image Receptors-Select Synchronization Type



- **Wired To**: Always "*Generator*" as the default value for Standard Hardwired synchronization. "None" for all other options than *Hardwired*.

- **HW Interface**: The value depends on the type of detector synchronization and the Imaging System configuration. "None" for all other options than *Hardwired*.

2.4.2.3 POSITIONERS

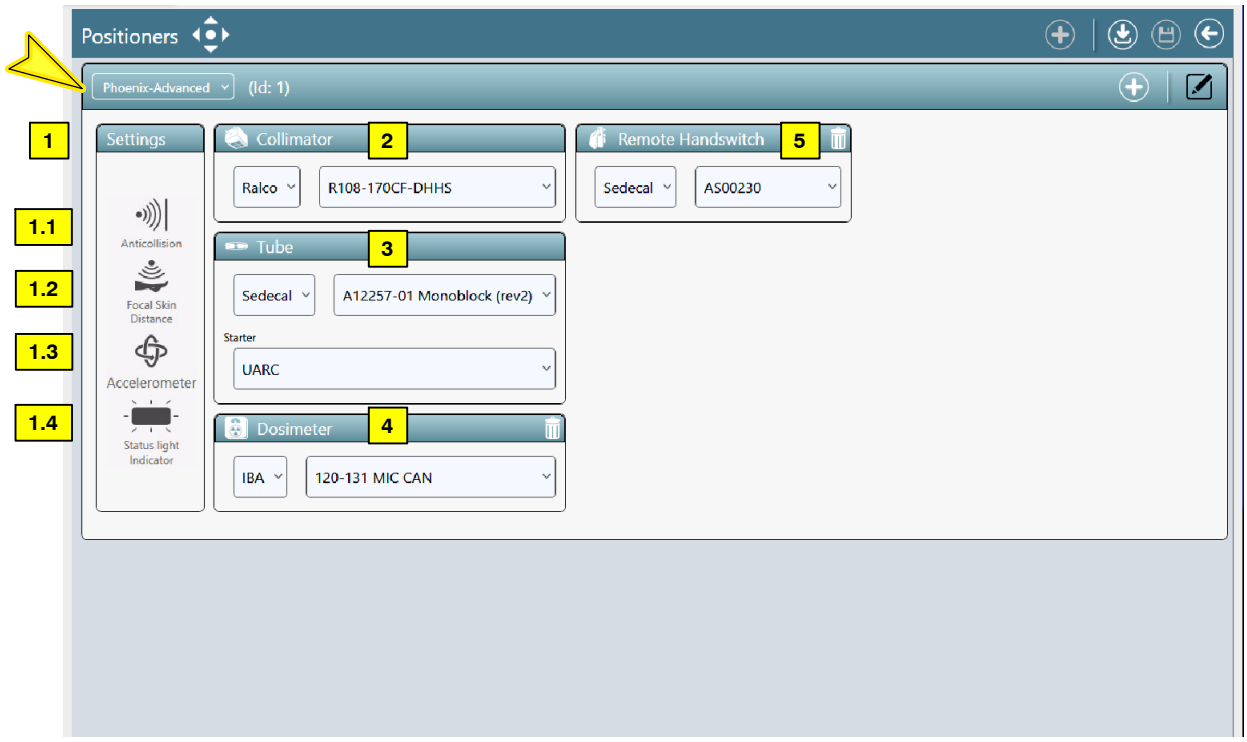


The “Positioners” screen allows to add or modify the different components of the provided Unit, as well as enable/disable the system options.

Each time a system component is added or modified, its corresponding calibration will be needed in the menu option. Likewise, some system options need to be calibrated when they are first enabled in the “Settings” section.

By default, the system model selected is “Phoenix-Advanced”, displaying the factory set components and options according to the purchased license. A new system could be added for technical purposes by pressing the “Add” icon.

Illustration 2-94
Positioners Configuration Screen: Settings and System Components



SYSTEM OPTIONS

1. Settings
1.1 Anticollision
1.2 Focal Skin Distance
1.3 Accelerometer
1.4 Status Light indicator

SYSTEM COMPONENTS

2. Collimator: Manufacturer and Model
3. Tube: Manufacturer, Model, Starter
4. Dosimeter. Manufacturer and Model
5. Remote Handswitch Manufacturer and Model

The Settings section, allows to enable or disable system options.

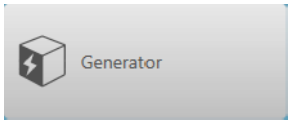
- Anticollision (Proximity Sensors).
- Focal Skin Distance Sensor.
- Accelerometer.
- Status Light Indicator.
- eDAP
- eDOSE

Note ☞ *Depending on the License purchased, if the Unit is equipped with a Dosimeter, the eDAP and eDOSE system options may not be available in this menu, and vice versa.*

To modify the components of the system or to select the components of a newly added system, select the manufacturer and model from the drop-down list among the available options for each component.

- Collimator.
- X-ray Tube.
- Dosimeter (*depending on the License, may not be available if the eDAP or eDOSE options are enabled*).
- Remote Handswitch.

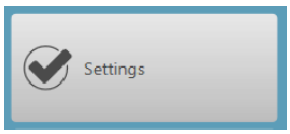
2.4.2.4 GENERATOR CONFIGURATION



Press the “Generator” button to display the Generator configuration options:

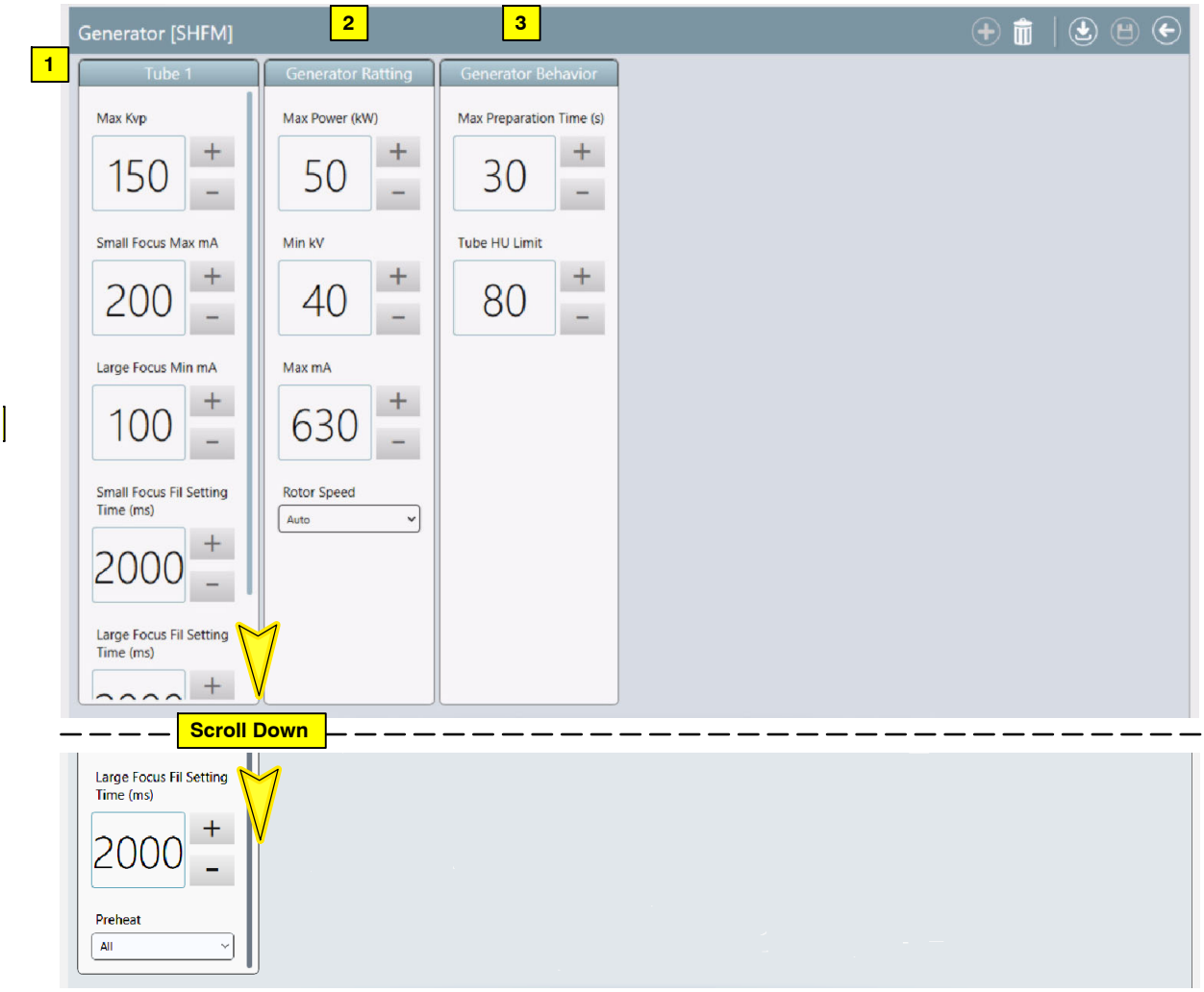
- “Settings”.
- “Dropout Stations”.

Illustration 2-95
System Configuration: Generator



▶ **SETTINGS**

Illustration 2-96
System Configuration - Generator: Settings



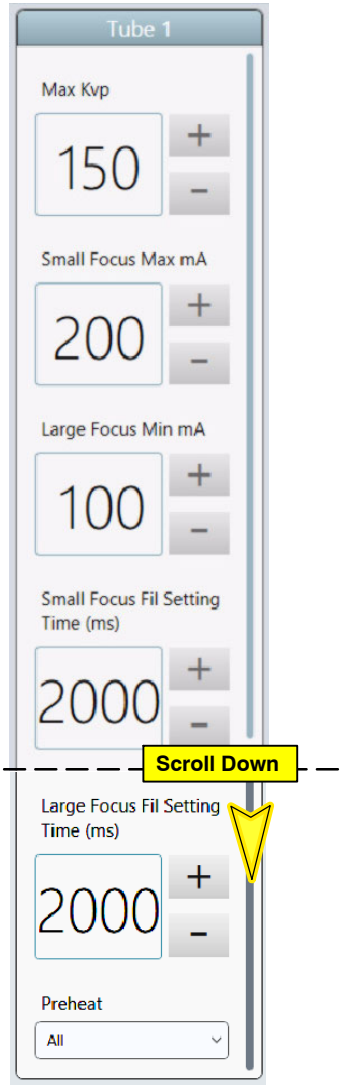
1. Tube 1
2. Generator Ratting
3. Generator Behavior

The Generator Settings screen is divided in several columns.
Each column is related to a specific group of parameters:

- Tube 1
- Generator Rating Settings
- Generator Behaviour Settings

When all the configuration parameters are set, press the “Store Data” button to save the changes and the “Back” icon to leave the “Settings” screen.

Note ☞ *After saving the configuration settings, it is necessary to reset the Service Mode / Service Tool to apply the changes to the Generator. Exit the Unit Service Mode and re-enter.*



TUBE 1

Use the Scroll bar to navigate through the different configuration options.

- **Max kVp**

  Maximum kVp of the equipment can be limited from the maximum to the minimum allowed by the licence. This option is especially useful when the X-ray Tube is not working properly at high voltage techniques.

- **Small Focus max mA and Large Focus min mA**

  This configuration determines the highest mA station for the Small Focal Spot and the smallest mA station for the Large Focal Spot.

  Small and Large Focal Spots can overlap each other, so it is possible to configure all the mA stations for the Large Focal Spot.

  The smallest mA station for the Large Focal Spot must be selected according to the customer preference.

  When the mA stations are configured, a pop-up message alerts about the Focal Spot change condition, which can be automatic or non-automatic.

CAUTION

If more mA stations are selected for any of the Focal Spots after performing the calibration procedure, calibration of the new mA stations must be completed before using the equipment. Otherwise, the X-ray tube could be damaged.

a. Select the maximum mA station for the Small Focal Spot.
If the maximum mA station configured for the Small Focal Spot exceeds the limits allowed by the X-ray Tube, it will be limited by software. The value will not be reachable in the User Console.

b. Select the minimum mA station for the Large Focal Spot.

Note ☞

If the mA stations selection is not correct, a pop-up message is shown alerting about it and the selection will not be modified.

- **Small Focus and Large Focus Fil Setting Time: ms**

  This option is used to set the minimum preparation time.

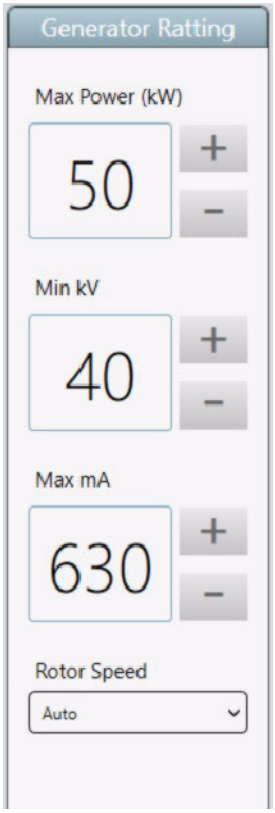
  Filament Setting Time for both Focal Spots is configurable, so it can be modified, if needed, depending on the tube characteristics.

- **Preheat**

  This option is used to preheat the selected filaments of the X-ray Tube.

  The allowed options are:

  - *None*: When this option is selected, no filament is preheated ever.
  - *Small*: Select this option to preheat the small filament when it is selected. The large filament will not be preheated when selected.
  - *Large*: Select this option to preheat the large filament when it is selected. The small filament will not be preheated when selected.
  - *All [Default setting]*: Select this option to preheat both filaments in studies where both filaments are available. Otherwise, only the used filament is preheated.



GENERATOR RATING SETTINGS

Use the Scroll bar to navigate through the different configuration options.

- **Max Power (kW)**

  The maximum kW of the Generator is factory set according to the Generator performance.

  Generator kW can be limited to a lower value. This reduction is applied to the Generator not only in user mode, but also during calibration.

  This reduction is applied to the Generator not only in user mode, but also during calibration.

- **Min kV**

  Minimum kV of the Generator is 40. However, it can be limited to 50, so the 40 kV station will not be calibrated during the autocalibration procedure and 50 kV will be automatically picked by the Generator as the minimum kV station available.

- **Max mA**

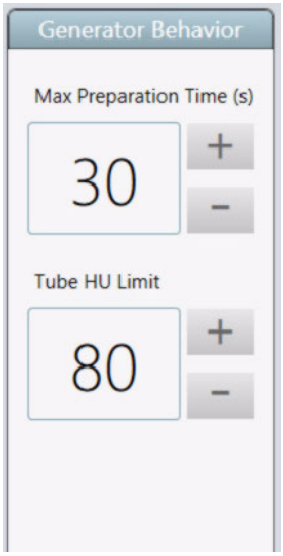
  Maximum mA can be limited down, so the mA stations over the established limit will not be calibrated during the Auto Calibration procedure.

- **Rotor Speed**

  Depending on the customer preferences, the Generator can be set to work permanently in high speed, whenever the Tube allows it, or in low speed.

  The allowed options are:

  - High: to work always in High speed.
  - Low: to work always in Low speed.
  - Auto: high speed is only used when the exposure parameters can not be achieved in low speed (it is the recommended option).



GENERATOR BEHAVIOUR SETTINGS

Use the Scroll bar to navigate through the different configuration options; note that some features may not be configured for this system.

- **Max Preparation Time: s**

  A maximum preparation time can be established to protect the Tube filament. When the Exposure control is pressed halfway (“Prep” position), the X-ray Tube is ready for the exposure.

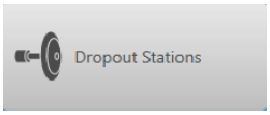
  If the handswitch remains pressed in “Prep” position longer than the maximum preparation time, the Filament will be automatically switched to stand-by position.

- **Tube HU Limit: %**

  The maximum heating of the Tube in respect to its capacity can be limited to a lower value in 5% steps, from 100% to 50%.

  The default setting is “80” %.

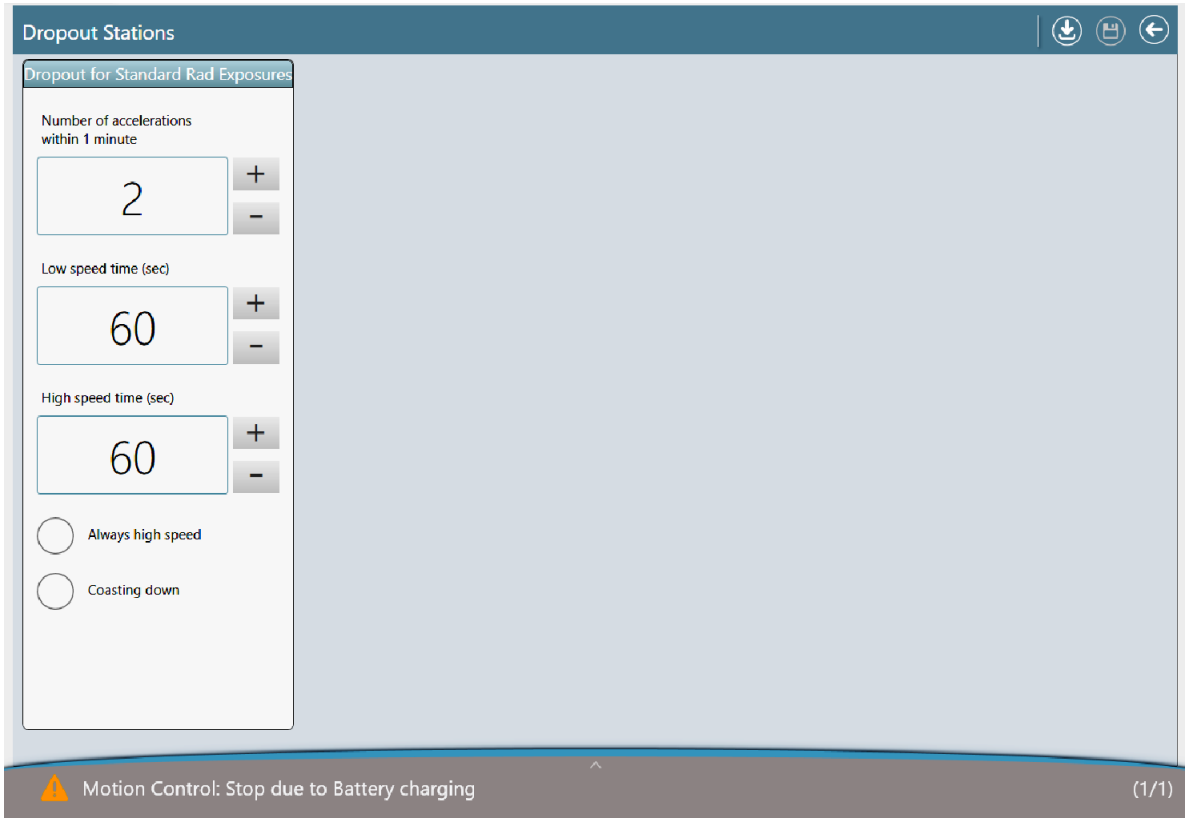
  The Heat Units value will always be displayed to the user in a scale from 0 to 100, with 100 being the maximum value set in this field.



▶ DROPOUT STATIONS

Use the Scroll bar to navigate through the different configuration options.

Illustration 2-97
System Configuration - Dropout Stations



DROPOUT FOR STANDARD RAD EXPOSURES

- **Number of accelerations within 1 minute**

  Select the desired number of times the Exposure Control has to be pressed in less than one minute in order to start the Dropout Time, as set in the “Low speed time (sec)” and “High speed time (sec)” fields in all the columns.

  0 means no dropout time.

- **Low speed time (sec) and High Speed time (sec)**

Select the Tube Dropout Time for High speed and Low speed depending on the tube requirements according to the technique to be used.

Note ☞ *If the Low Speed Dropout Time is longer than the High Speed one, Dropout Time will be always the selected value for Low Speed, even in High Speed.*

The anode rotation continues during the selected time when the Exposure Control is pressed to preparation position a predetermined number of times in less than one minute, as set in the “Number of accelerations within 1 minute” field.

If the Exposure Control is pressed during Dropout Time, the Tube anode will continue rotating to complete a whole new Dropout Time cycle.

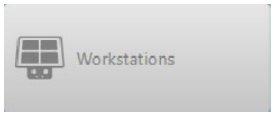
0 means no Dropout Time.

- **Always high speed**
  - Check off this option to keep High speed active.

- **Coasting down**
  - Check off this option to deactivate the Low speed brake.
  - Uncheck to activate the Low speed brake.

Note ☞ *High speed brake is always active. If the Tube is in High speed, it first reduces to Low speed regardless of the selected option.*

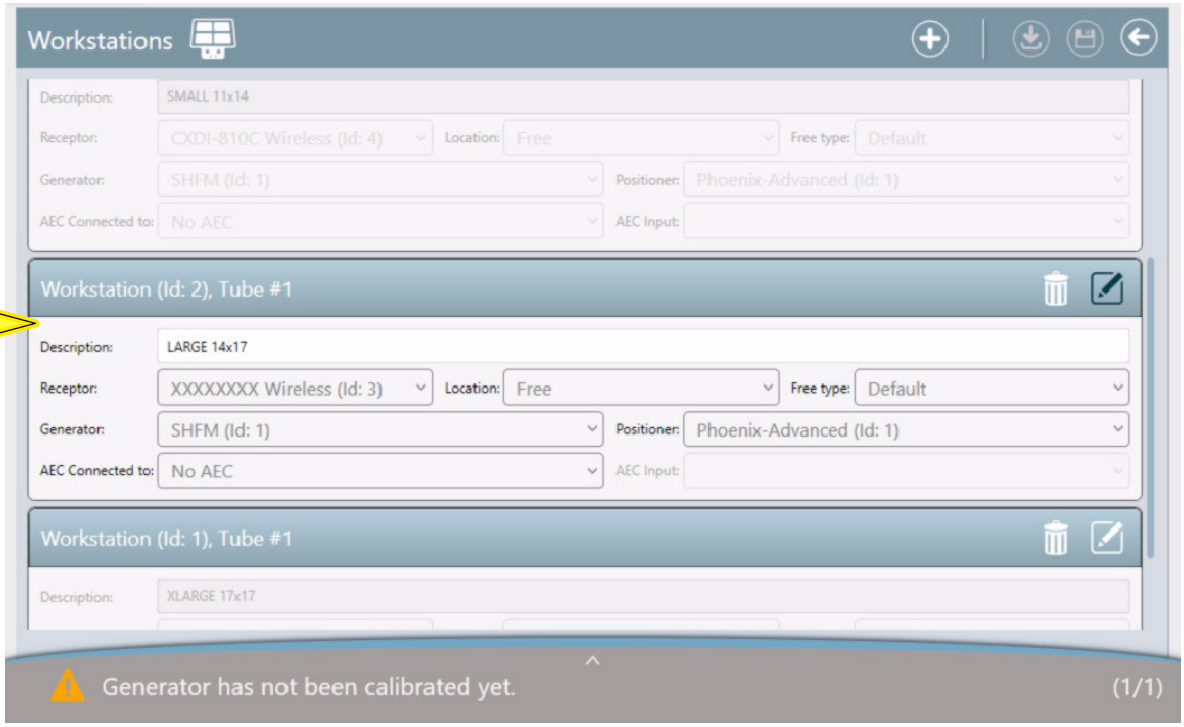
2.4.2.5 WORKSTATIONS



The Workstations can be configured according to the customer preferences.

Apart from the factory settings, it would be possible to add a new Workstation or to modify the values of the current workstations on the list.

Illustration 2-98
Workstations Configuration Screen



Note ☞ *The system can have up to a maximum of 5 registered Workstations.*

For adding a new Workstation, press the “Add” button *(“+” icon)*. Then, a new empty workstation frame is displayed on the list.

Once the Workstation is added, the new frame displays an **Id** number, the number associated with the default system’s **Tube** and a default **Description** to facilitate its identification.

Illustration 2-99
System Configuration: Workstation – Newly Created Workstation

Whether you press the “*Edit*” button or set the configuration of a newly created Workstation, the fields included in a workstation frame are:

- **Description:** Workstation description to facilitate the identification.
- **Receptor:** Receptor selection. *[The selection of a receptor is mandatory]*.

Note ☞ *In order to set a “Free” Workstation, select the Direct Mode receptor (“Film”) in this field. Refer to Section 2.4.2.2*.

- **Location:** *[Not Applicable]*. Always “Free” as default value.
- **Free type:** *[Not Applicable]*. Always “Default” as default value.
- **Generator:** *[Not Applicable]*. Always “SHFM” as default value.
- **Positioner:** *[Not Applicable]*. Always “Phoenix Advanced” as default value.
- **AEC Connected to:** *[Not Applicable]*.
- **AEC Input:** *[Not Applicable]*.

Note ☞ *When selecting an option that is not compatible with any of the other selectable options for a workstation, unsupported values will be grayed out.*

A Workstation can be deleted by using the *Erase* button (“*Trash*” icon).

2.4.3 OPERATOR SETTINGS

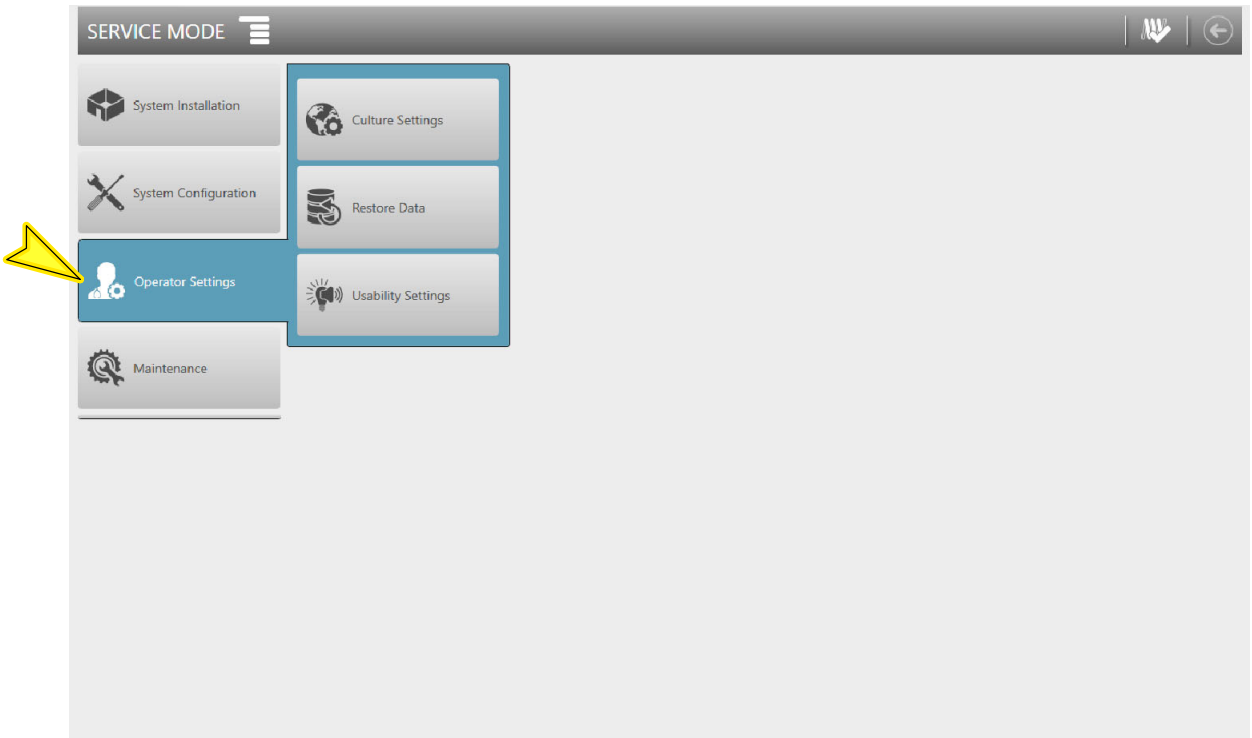
"Operator Settings" menu comprises two configuration options for system operation: Culture Settings and Usability Settings.

Note ☞

To apply the parameters of the settings performed on the Head-Assembly Console software, it is necessary to have entered the Service Mode on the Head-Assembly Console.

Modifications applied in the Service Tool from the main screen will not take effect in the Operating Mode of the head console.

Illustration 2-100
Operator Settings



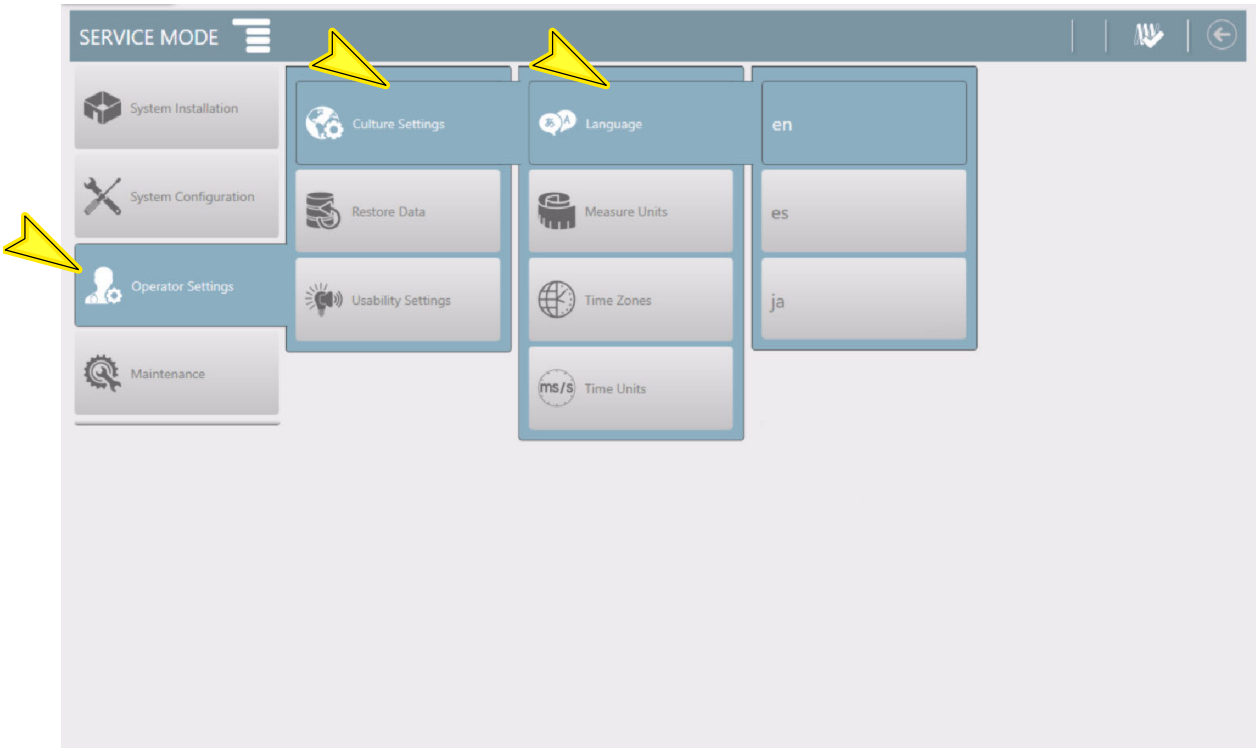
2.4.3.1 CULTURE SETTINGS

▶ LANGUAGE

Press the “Language” icon to switch between the available languages.

The Service Mode and the Operator application will be automatically updated to match the selected language.

Illustration 2-101
Operator Settings: Culture Settings, Language Selection

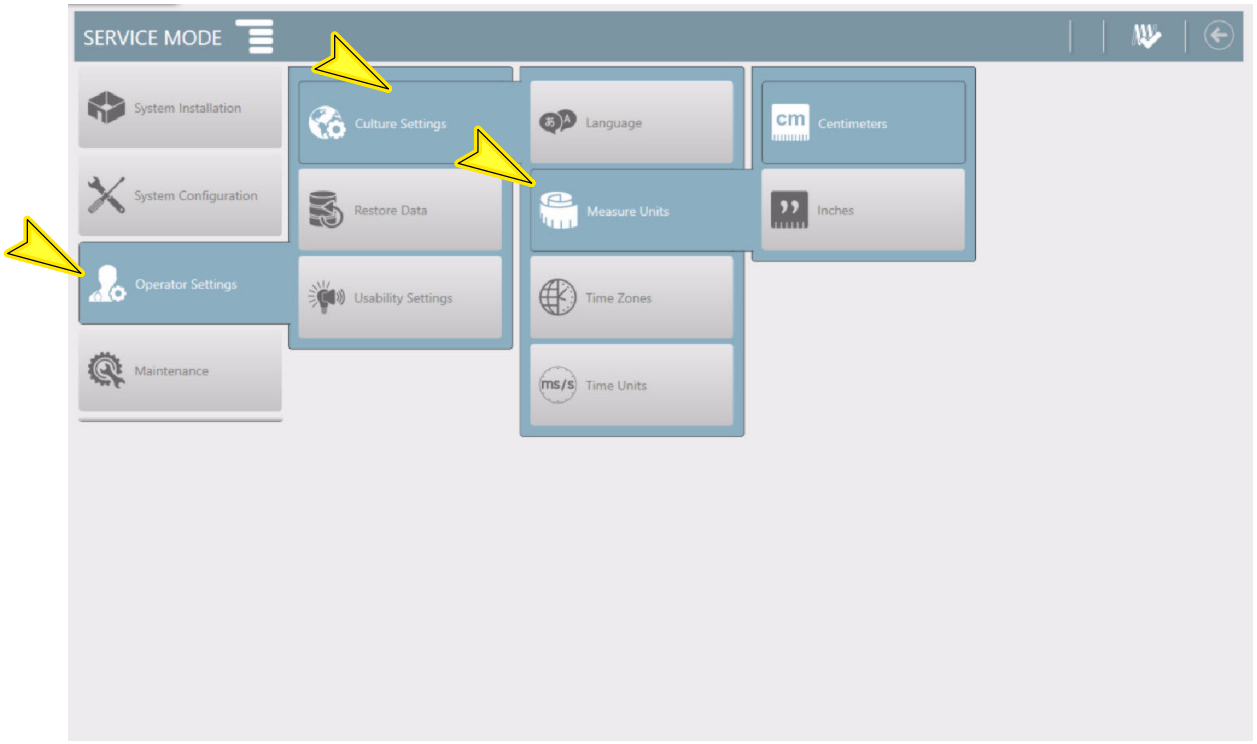


▶ MEASURE UNITS

Use the “Measure Units” button to switch between the Metric system and the American/Imperial system. Available options are “Centimeters” or “Inches”.

Note ☞ *It is necessary to reboot the Console to apply the change of Measurement Units, but not the whole system.*

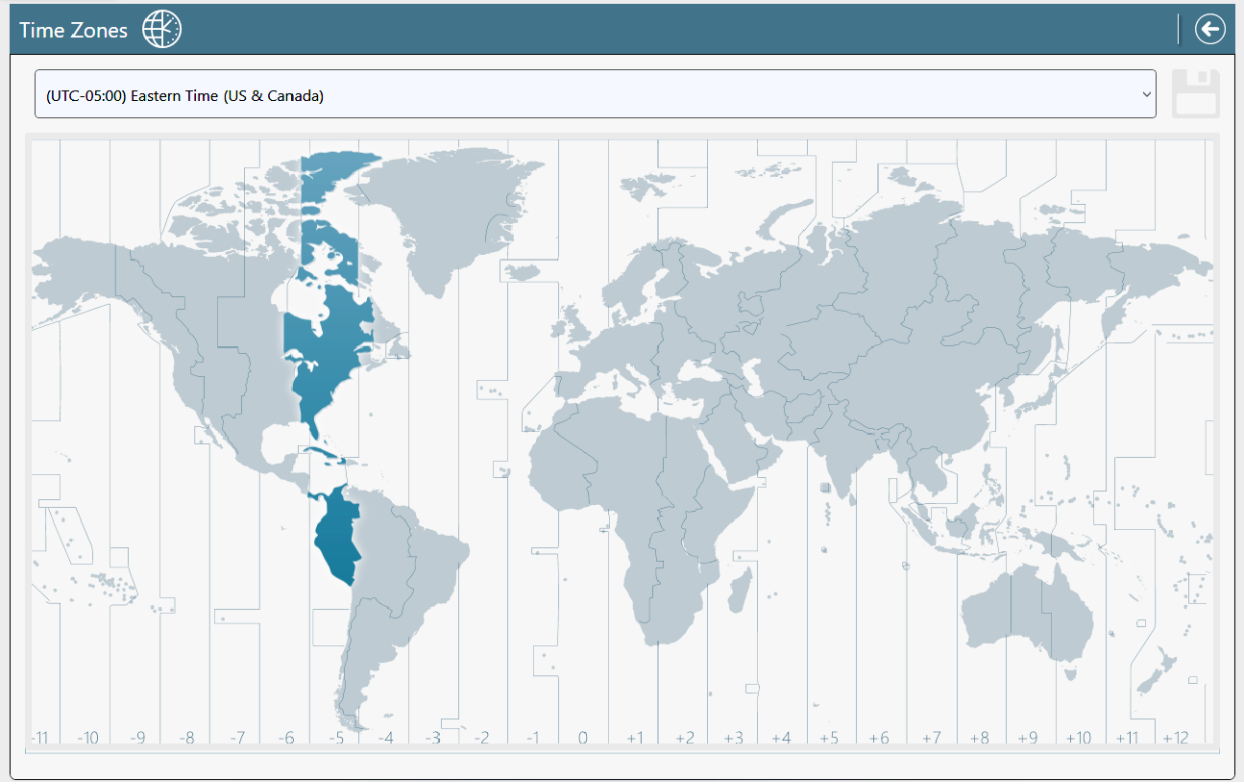
Illustration 2-102
Operator Settings: Culture Settings, Measuring units



▶ TIME ZONES

Use the “Time Zones” button to to select the relevant time zone. Press the “Store” button to store the selected zone.

Illustration 2-103
Time Zone Selection

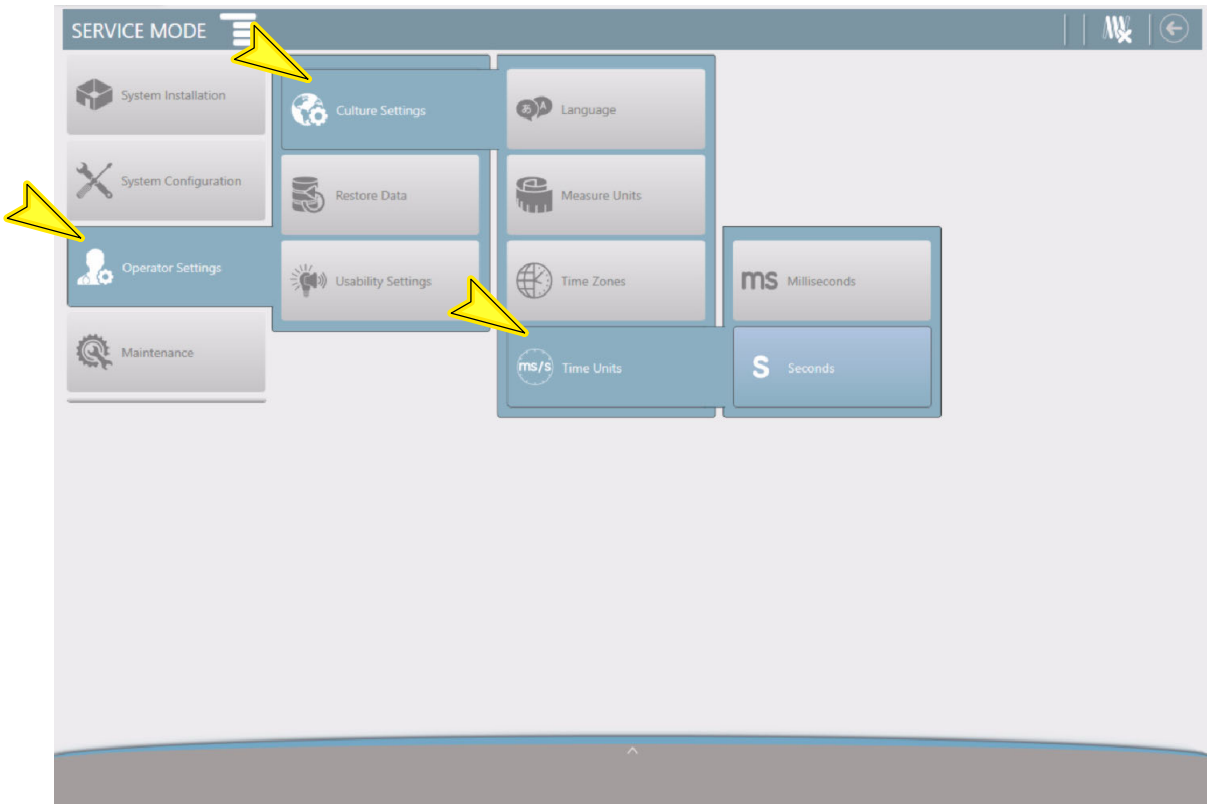


▶ TIME UNITS

Use the “Time Units” menu to select “Milliseconds” or “Seconds” as the time unit in the exposure parameters.

Note ☞ *It is necessary to reboot the Console to apply the change of Time Units, but not the whole system.*

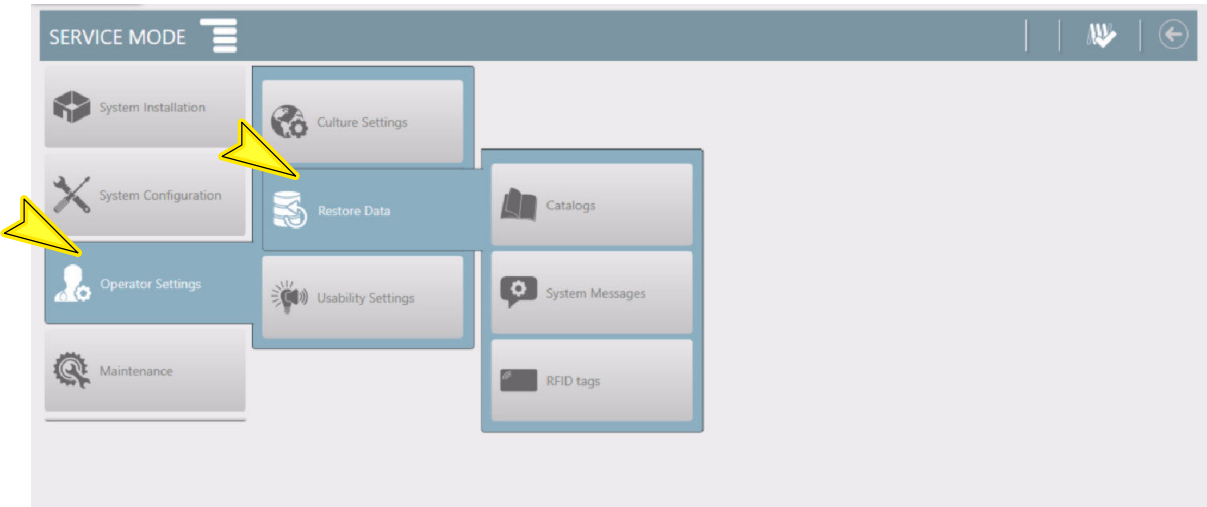
Illustration 2-104
Operator Settings: Culture Settings, Time Units



2.4.3.2 RESTORE DATA

The “Restore Data” option in Operator Settings enables restoration or updating of the system components Catalogs (available in system configuration menus), the System Messages database or the stored RFID Tags.

Illustration 2-105
Operator Settings: Restore Data



▶ **CATALOGS**

Replace a system components (X-ray Tubes, Detectors, Collimators...) Catalog file from the equipment memory (“Site” option).

▶ **SYSTEM MESSAGES**

Replace the System Messages database from the equipment memory (“Site” option).

▶ **RFID TAGS**

Replace the RFID Tags from the equipment memory (“Site” option) or a USB flash drive (”USB Drive” option).

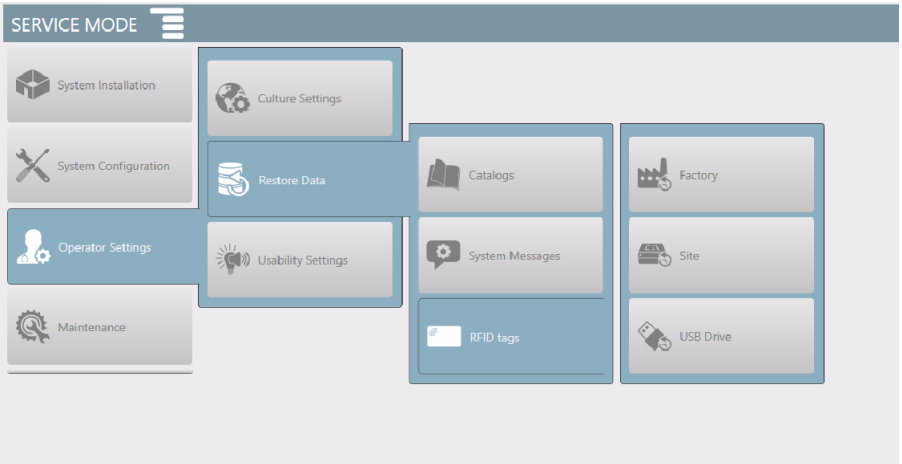
Note ☞ *For all options it is possible to restore the factory default data by selecting the “Factory” option.*

To restore Catalogs, System Messages or RFID Tags from “Site” (backup data from the equipment memory) or “USB Drive” (backup data stored a USB flash drive), proceed as follows:

Note ☞ *The “Site” options involve the backup data created from the “Backup” menu (refer to Section 2.4.4.5).*

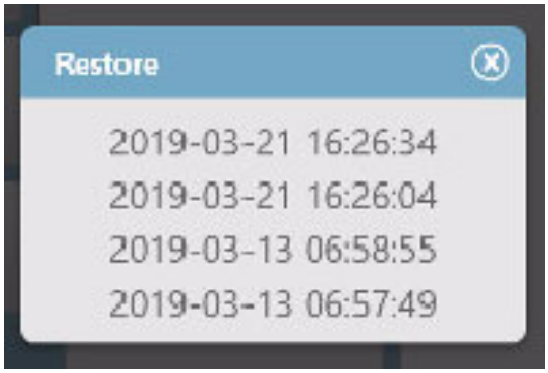
1. Select“Site” or “USB Drive” option from the desired menu (Catalogs, System Messages or RFID Tags).

Illustration 2-106
Operator Settings – Restore Data Selection



2. A pop-up window will display the stored backup files, which are identified by creation date and time. Select the desired backup file.

Illustration 2-107
Operator Settings – Restore Data: Backup Selection



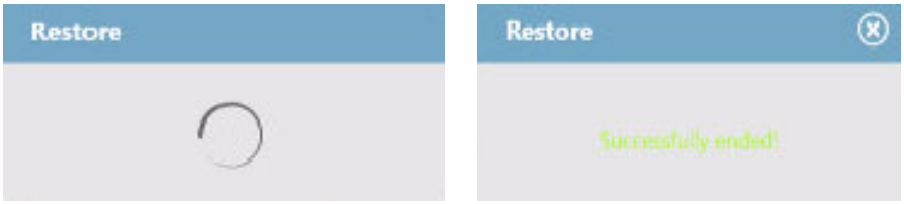
3. Regardless of the option selected (”Factory”, “Site” or “USB Device”), since the saved configuration will be deleted, a pop-up confirmation window will offer the possibility of making an automatic backup of the current configuration so as not to lose the data.

   - Press “Yes” to proceed with the restoration process by creating a new backup.
   - Press “No” to proceed with the restoration process without creating a backup.
   - Press the “Close” button to cancel the restoration and return to the menu.

Illustration 2-108
Operator Settings – Restore Data: Restore Confirmation Window

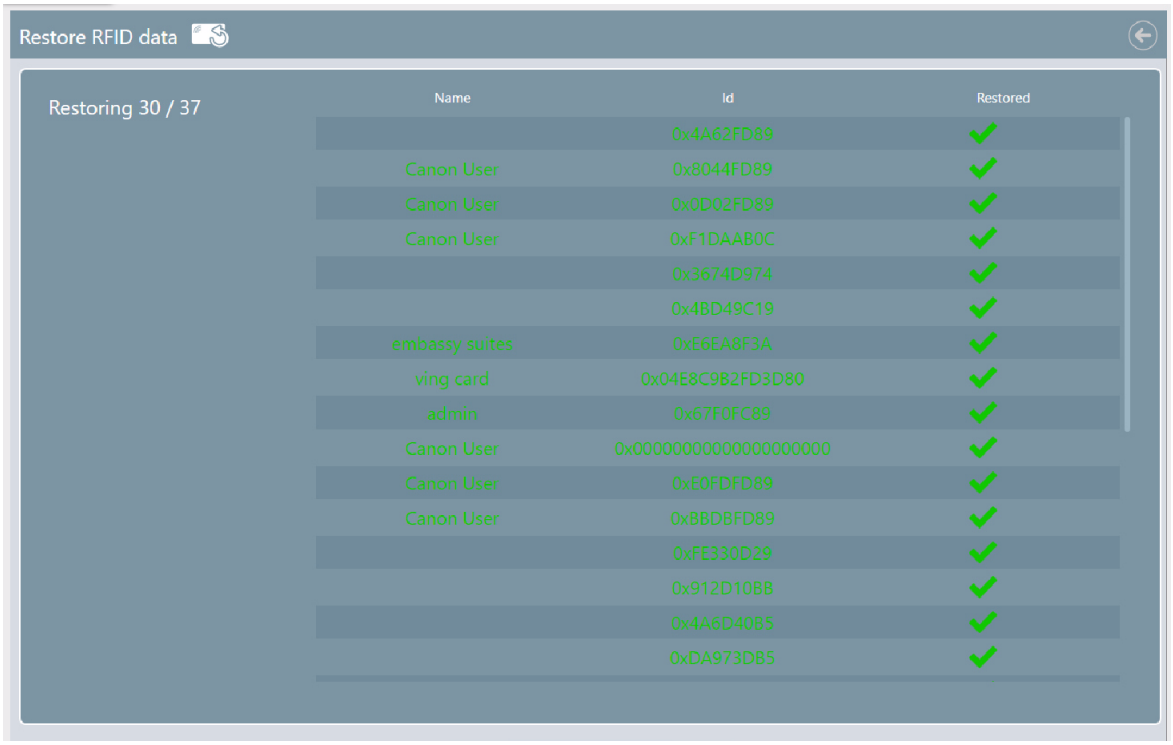
4. A pop-up window shows the progress of restoration process. Once all the system settings has been restored, press the “Close” to confirm.

Illustration 2-109
Operator Settings – Restore Data: Restoration Process



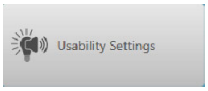
In the case of RFID Tags data restoration, a detailed window shows the progress of each tag (displaying “Name”, “Id” and “Restoration Status”).

Illustration 2-110
Operator Settings – Restore Data: RFID Tags



5. Once the data restoration process is complete, press the “Back” button to go back to the main menu.

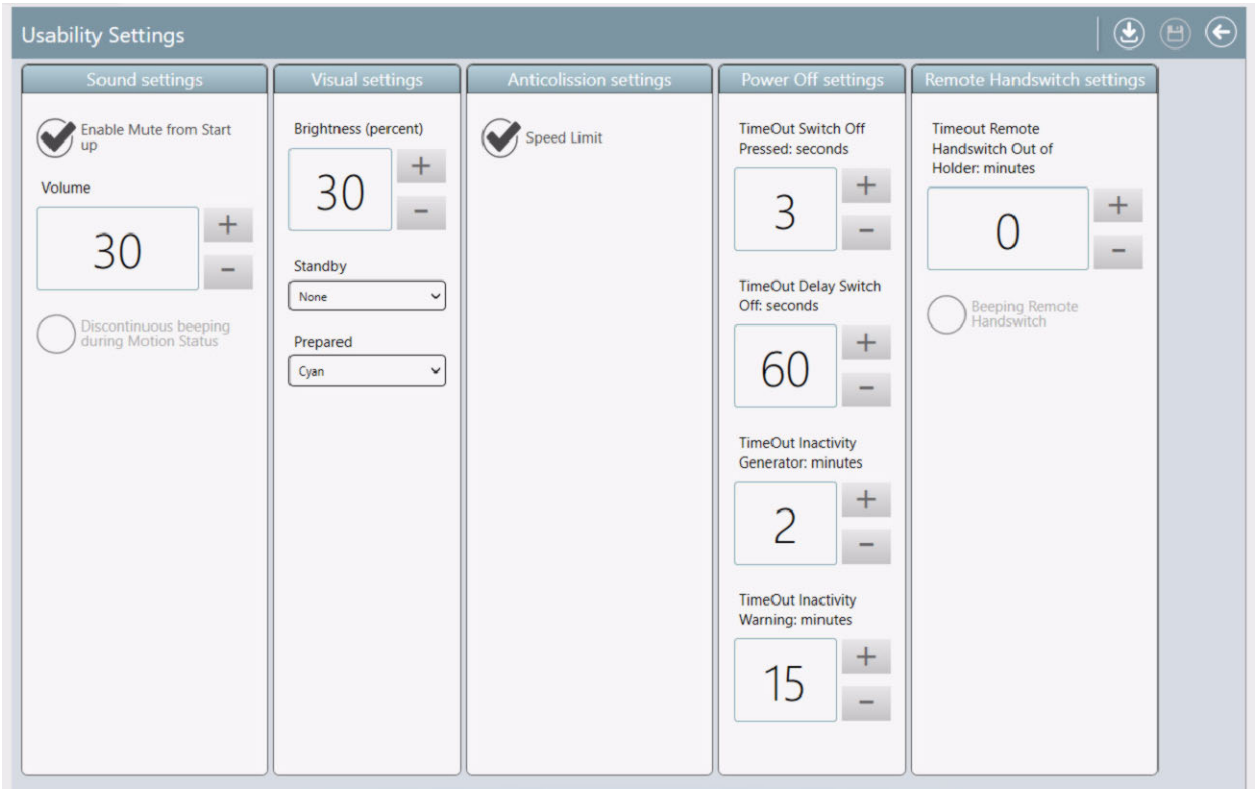
2.4.3.3 USABILITY SETTINGS



The “Usability Settings” screen is used to set the Sound Settings, Visual Settings, Anticollision Settings and the Power Off settings of the system.

Note ☞ *It is recommended to select the values shown in the next screen.*

Illustration 2-111
Usability Settings



▶ SOUND SETTINGS

To set parameters such as enable mute, Volume, and discontinuous beeping during Motion.

▶ VISUAL SETTINGS

To set the brightness percentage and the colors for Standby and Prepared status of the Mobile Unit.

▶ ANTICOLLISION SETTINGS

Speed Limit option can be selected in this Section.

▶ POWER OFF SETTINGS

Time Out Switch Off Pressed.

Default configured time: 3 seconds.

Press and hold the *Switch OFF* button for 3 seconds; the system will start the turning OFF process.

Time Out Delay Switch Off.

Default configured time: 60 seconds.

After holding pressed for 3 seconds the *Switch OFF* button, the system will be completely turned OFF in 60 seconds; during this time only movements are enabled (e.g., it is useful for the user to put the system in the Parking position, if necessary).

Time Out Inactivity Generator.

Default configured time: 2 minutes.

When the system is disconnected from mains and there is not any Generator activity during 2 minutes, the Generator Tube Filaments turn off, unless the user performs any action on the RAD screen, presses the handswitch/remote control (option) or connects the system to the mains; it will delay the *Time Out Inactivity Generator* for another 2 minutes without any Generator activity.

Time Out Inactivity Warning.

Default configured time: 15 minutes.

When the system is disconnected from the mains and there is not any Generator activity for 15 minutes, a Warning message is displayed on the screens to alert the user of an automatic shutdown after finishing a countdown timer for another 15 minutes.

If the Operator presses on *Accept* button or performs any system action (touches on the RAD Screen, activates any of the movement controls, presses the handswitch/remote control option) within the configured time; it will delay the *Time Out Inactivity Warning* for another 15 minutes. In case the system is connected to the mains, the 15 minute countdown will be interrupted and the system will remain ON indefinitely.

If the Operator does not respond within the countdown time of 15 minutes, the system will automatically shut down; i.e., the system will be completely turned OFF after 30 minutes without activity.

▶ REMOTE HANDSWITCH SETTINGS

Timeout Remote Handswitch Out of Holder.

Default configured time: 0.

To configure the time (in minutes) that the system will take to display an informational message if the IR Remote Control is not placed in its holder.

Beeping Remote Handswitch.

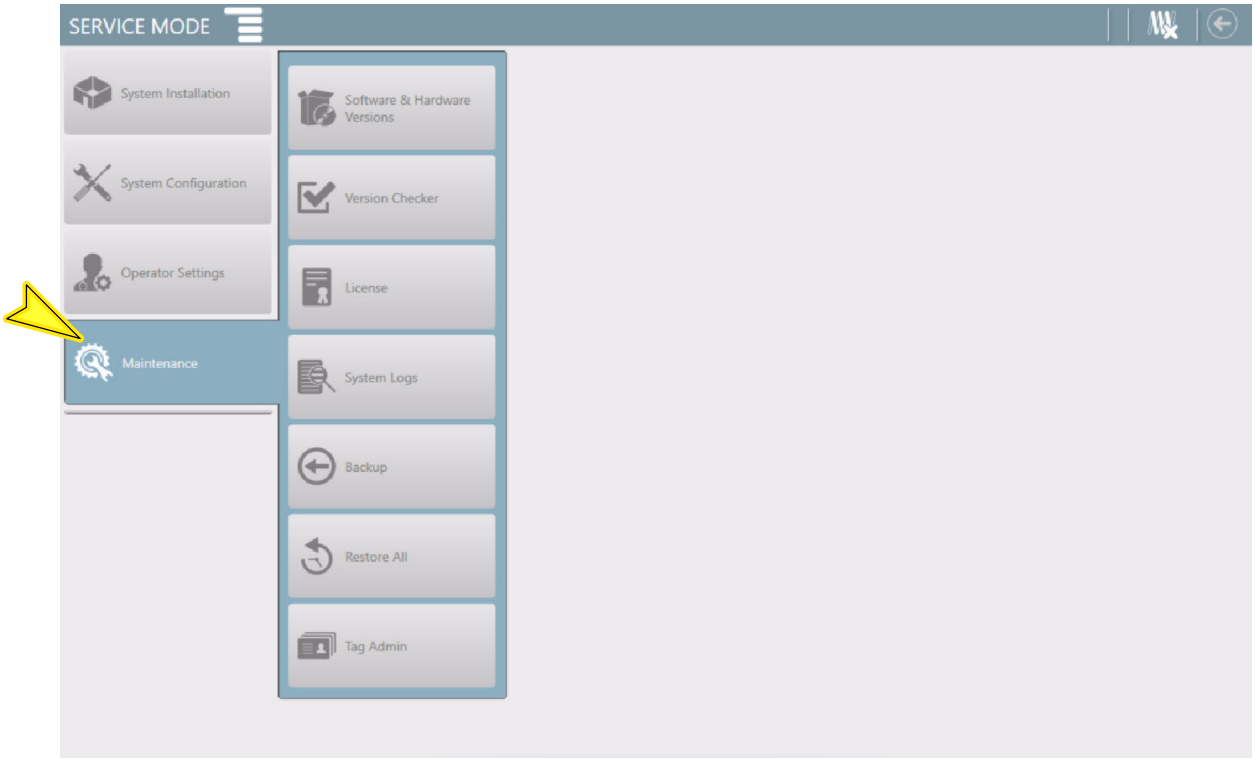
Disabled by default.

Enable this radio button to add a discontinuous beeping to the previous informational message each time the timeout specified in the “Timeout Remote Handswitch Out of Holder” field is exceeded.

2.4.4 MAINTENANCE

The “Maintenance” menu is used to check the system information (components versions, software package version, license functionalities), generate logs, recover backup and configure RFID tags.

Illustration 2-112
Maintenance Options

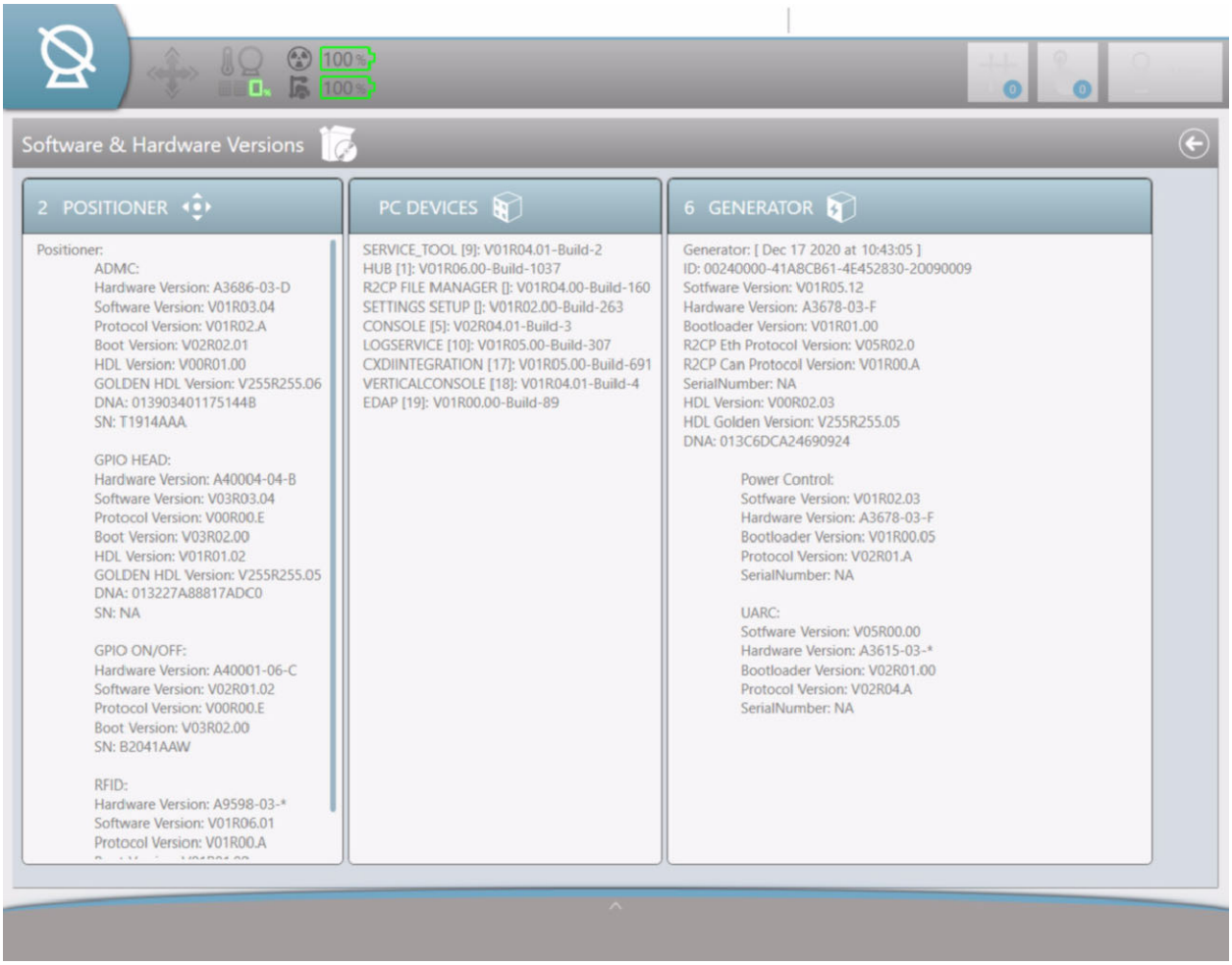


2.4.4.1 SOFTWARE / HARDWARE VERSIONS

Press the “Software / Hardware Versions” button to display the software and hardware versions of all the system components.

Press the “Back” button to go back to the main menu.

Illustration 2-113
Software / Hardware Versions Screen

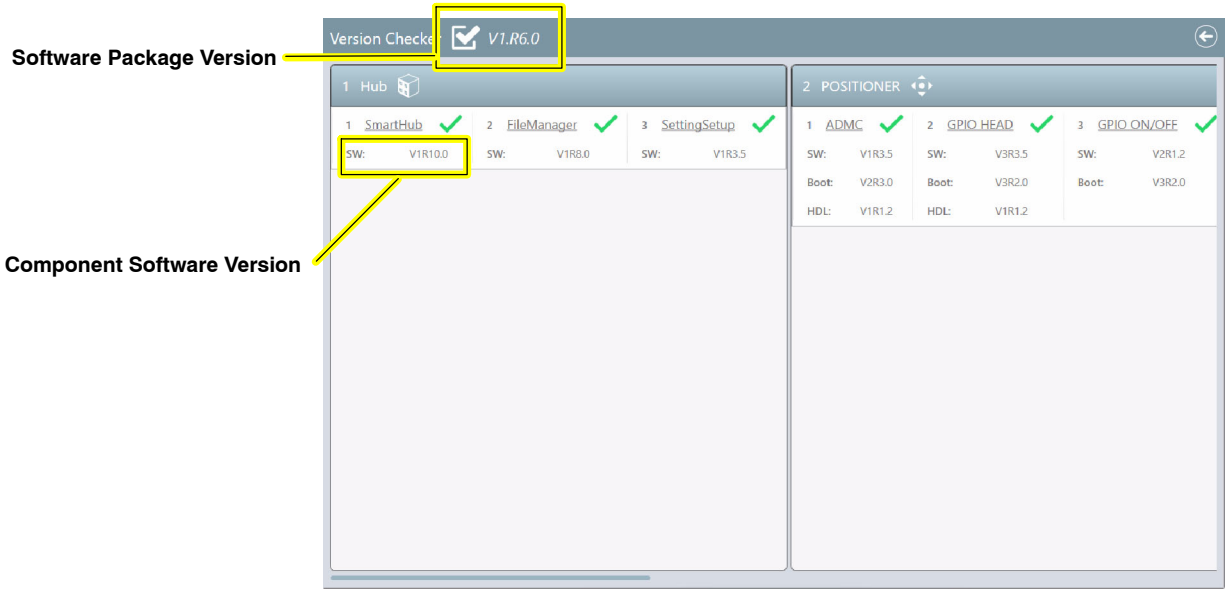


2.4.4.2 VERSION CHECKER

The “Version Checker” functionality enables to check the software versions of the different equipment components (PCBAs, Consoles, Acquisition Software, etc.) to ensure they match with the installed software package version.

The “Version Checker” window displays the versions of the software components and their matching with the installed software package version.

Illustration 2-114
Version Checker



A green check mark will indicate that the component software version matches the corresponding version of the installed software package.

On the contrary, a red cross icon will indicate that there is no match between the component and the software package, and the expected software version for that component will be displayed.

Illustration 2-115
Version Matching

In some cases, the software for a component that has not been properly updated may not be listed in the “Version Checker” window. Check the component listing to verify that all components are being displayed

The *components* to be displayed in the “Version Checker” window are:

- 1 HUB
  - *SmartHub*
  - *FileManager*
  - *SettingSetup*
- 2 POSITIONER
  - *ADMC*
  - *GPIO HEAD*
  - G*PIO ON/OFF*
  - *RFID*
- 5 CONSOLE: (*Console*)
- 6 GENERATOR
  - *Generator*
  - *Power Control*
  - *UARC*
- 9 SERVICE_TOOL: (*ServiceTool*) – *[Only if running]*
- 10 LOGSERVICE: (*LogService*)
- 19 EDAP: (*Console*) – *[If installed]*
- *[Acquisition Software Integration components] – [Only if running]*

Note ☞ *These components can also be checked in the “Software / Hardware Versions” window. Refer to Section 2.4.4.1.*

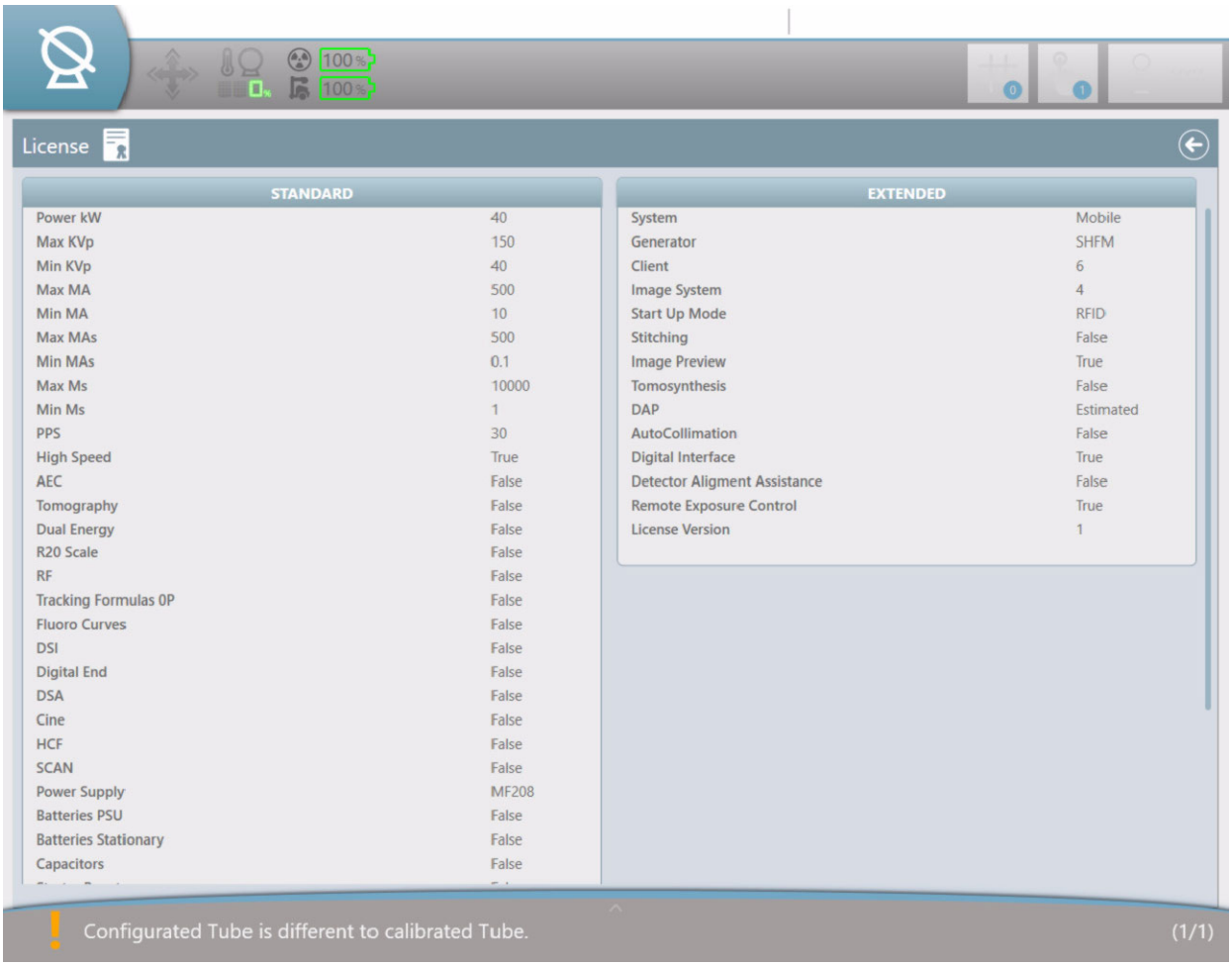
Once the version check is complete, press the “Back” button to go back to the main menu.

2.4.4.3 LICENSE

Press the “License” button to display all the system functionalities (Standard and Extended) enabled by license.

Press the “Back” button to go back to the main menu.

Illustration 2-116
License Screen



Note ☞

To use an external dosimeter, the “DAP” license must display ”Dosimeter”.

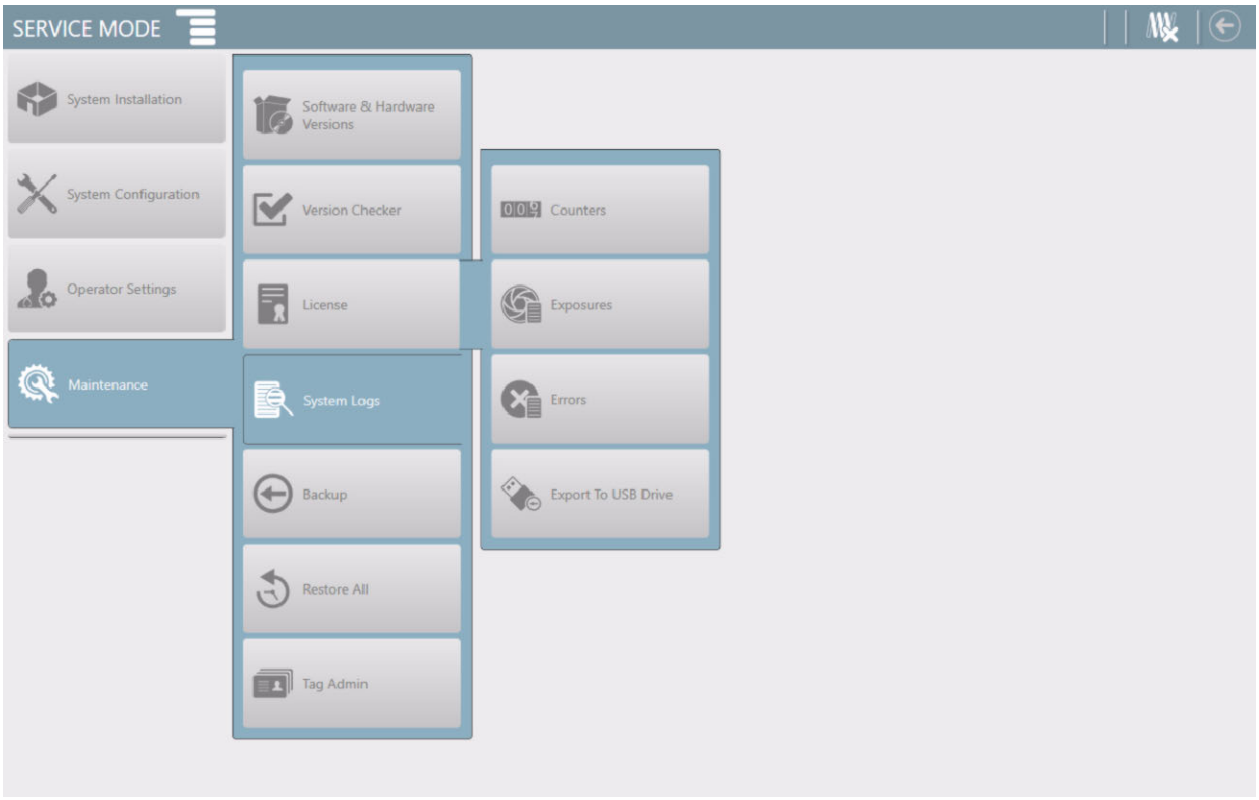
To operate with the eDAP/eDOSE functionalities, the “DAP” license must display “Estimated”.

Otherwise, these elements will not appear respectively in the “Positioners” configuration window in the System Configuration Menu (refer to Section 2.4.2.3).

2.4.4.4 SYSTEM LOGS

The purpose of the “System Logs” menu is to display the logs files generated by the system, as well as to enable them to be exported.

Illustration 2-117
System Logs Menu



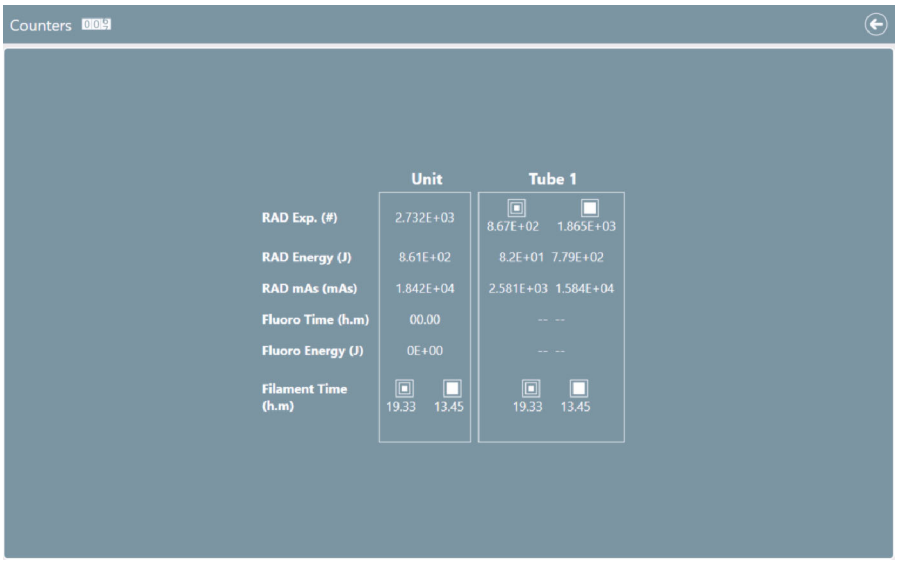
The available options are:

- **Counters**

  Press this button to display a counter with accumulated data of exposures performed with the system (corresponding to each focus selection of the tube as the cumulative of the Unit), counting the following elements:

  - **RAD Exp. (#)**: Number of exposures registered.
  - **RAD Energy (J)**: Accumulated energy (in joules) used in exposures.
  - **RAD mAs (mAs)**: Accumulated mAs in exposures.
  - **Flouro Time (h.m)**: *[Not Applicable]*.
  - **Flouro Energy (J)**: *[Not Applicable]*.
  - **Filament Time (h.m)**: Time period of operation (in hours and minutes) with selected *Small Focus* or *Large Focus*.

Illustration 2-118
Counters

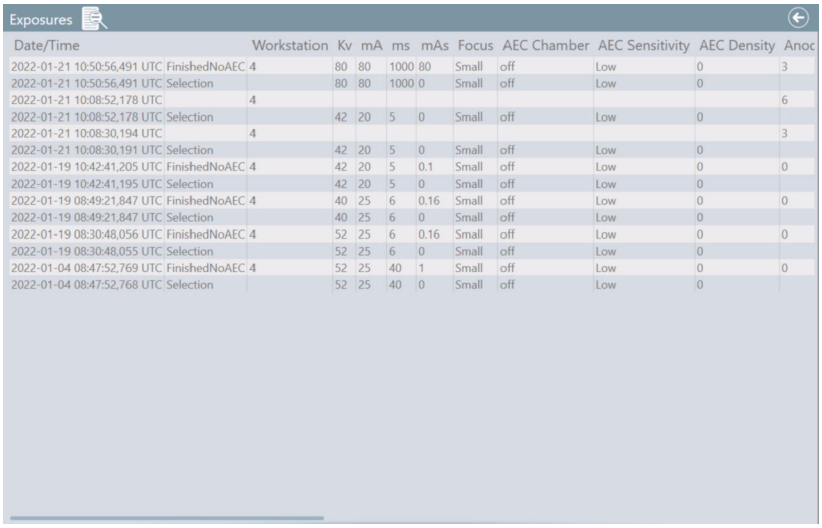


Note ☞ *The values are displayed in Scientific E Notation.*

- **Exposures**

  Press this button to display the a detailed record of all the exposures performed with the system.

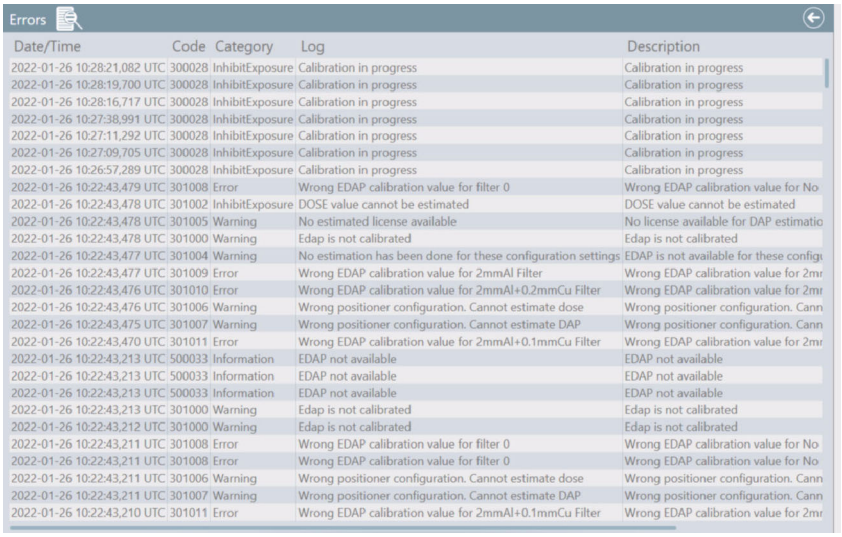
Illustration 2-119
Exposures



- **Errors**

  Press this button to display a detailed list with all the system messages stored during system operation.

Illustration 2-120
Errors



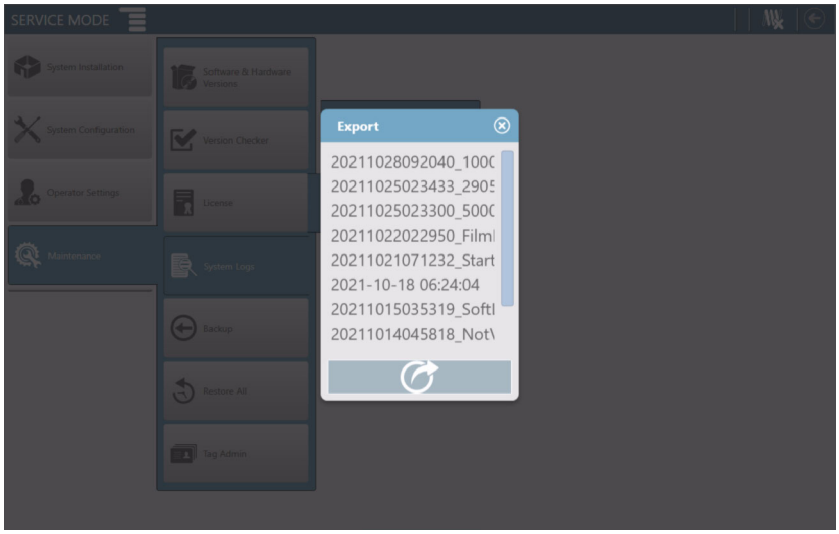
Note ☞ *The generation of system messages log files (System Snapshot) is available in the Message History window of the Operator Mode (refer to Operation Manual for further details).*

- **Export to USB Drive**

  Use this functionality to export the log files to a USB flash drive. (This option is only available when an operating memory stick is connected to a USB port).

  Select an stored log file by its date and press the “Export” button. When the export process is finished, a confirmation message will indicate that the files have been successfully copied to the USB drive.

Illustration 2-121
Log Export



2.4.4.5 BACKUP

The “Backup” menu enables the generation of recovery files for the configuration of each system component. The available options are:

- **Factory**.

  The backup with the default settings is set only once in factory. Afterwards, this option will always remain disabled.

- **Site**.

  Press this button to generate a backup of the current system configuration in the equipment memory.

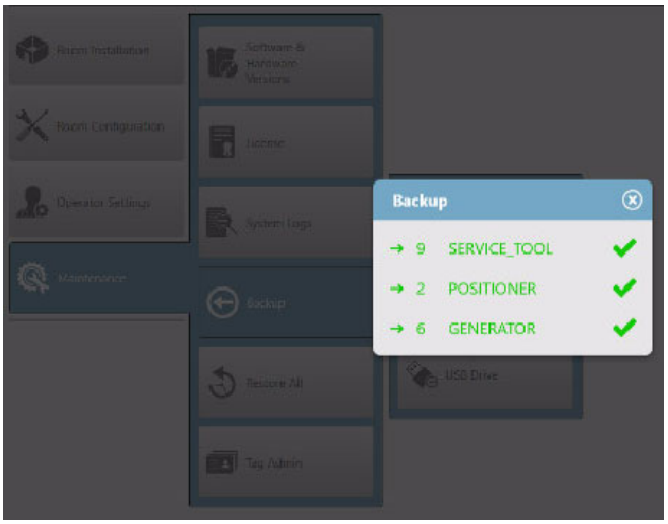
- **USB Drive**.

  Press this button to generate a backup of the current system configuration in USB flash drive. (This option is only available when an operating memory stick is connected to a USB port).

Note ☞ *Before backing up data to a USB flash drive, make sure that the device is formatted in FAT.*

Regardless of the option selected, a pop-up window shows the progress of backup generation for each component. Once the backup export is finished, press the “Close” button to return to the menu.

Illustration 2-122
Backup Generation



The different statuses of the Backup capture can be:

Backup export in progress

Successful backup export

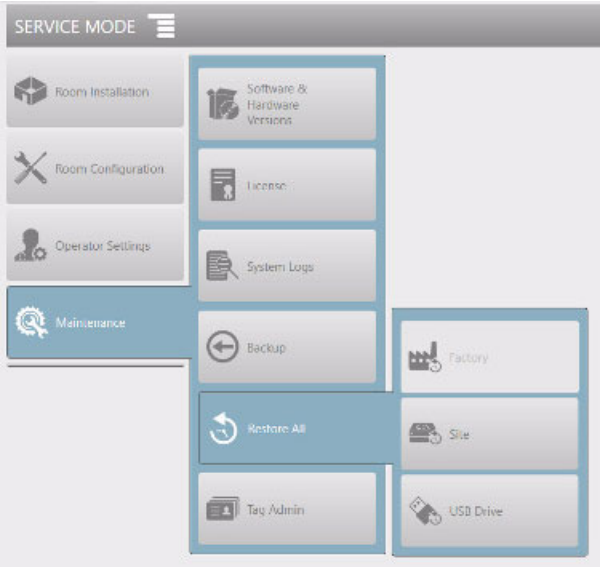
Failed backup export

2.4.4.6 RESTORE ALL

The “Restore All” menu enables the restoration of a previously generated backup or the system’s factory settings. The available options are:

- **Factory**. Press this button to restore the system’s factory settings for the client.
- **Site**. Press this button to recover a backup stored in the equipment memory.
- **USB Drive**. Press this button to restore a configuration backup stored in an USB flash drive. (This option is only available when an operating memory stick is connected to a USB port).

Illustration 2-123
Restore All Menu

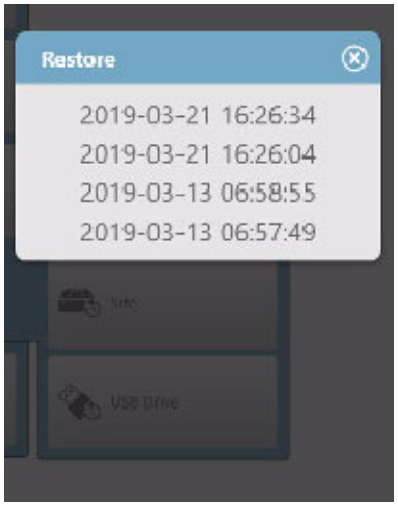


Note that all Service Tool / Service Mode menus have an specific Restore option to each settings group.

To restore all data, proceed as follows:

1. If the option selected was “Site” or “USB Drive”, a pop-up window will display the stored backup files, which are identified by creation date and time (*see Illustration 2-124*). Select the desired backup.

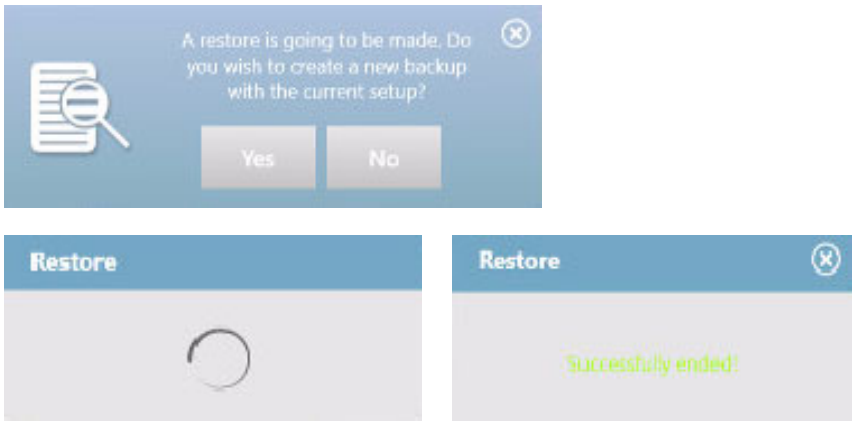
Illustration 2-124
Backup Selection



2. Regardless of the option selected (”Factory”, “Site” or “USB Device”), since the saved configuration will be deleted, a pop-up confirmation window will offer the possibility of making an automatic backup of the current configuration so as not to lose the data.

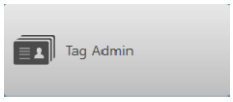
   - Press “Yes” to proceed with the restoring process by creating a new backup.
   - Press “No” to proceed with the restoring process without creating a backup.
   - Press the “Close” button to cancel the restoring and return to the menu.

Illustration 2-125
Restore Confirmation Window



3. A pop-up window shows the progress of restoring process. Once all the system settings has been restored, press the “Close” to confirm and Console will boot up.

2.4.4.7 TAG ADMIN



The “Tag Admin” window enables the local tags (RFID Cards) management used to initiate the system and access it with the privileges/permissions assigned to them.

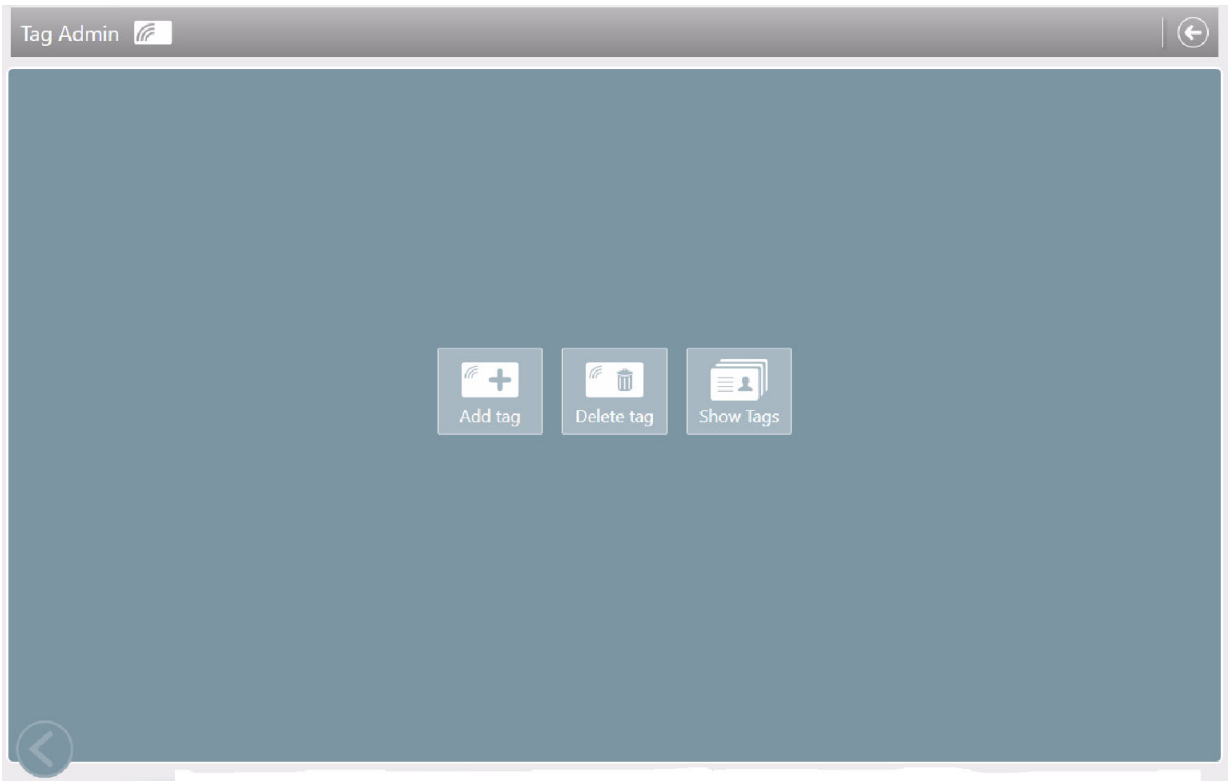
The available options in the “Tag Admin” window are “Add tag”, “Delete tag” and “Show tags”.

Note ☞

The tags (RFID Cards) managed in this menu only apply to the local database of the Base Unit.

The user management policy must be established in the Acquisition Software / Imaging System.

Illustration 2-126
Tag Admin Window



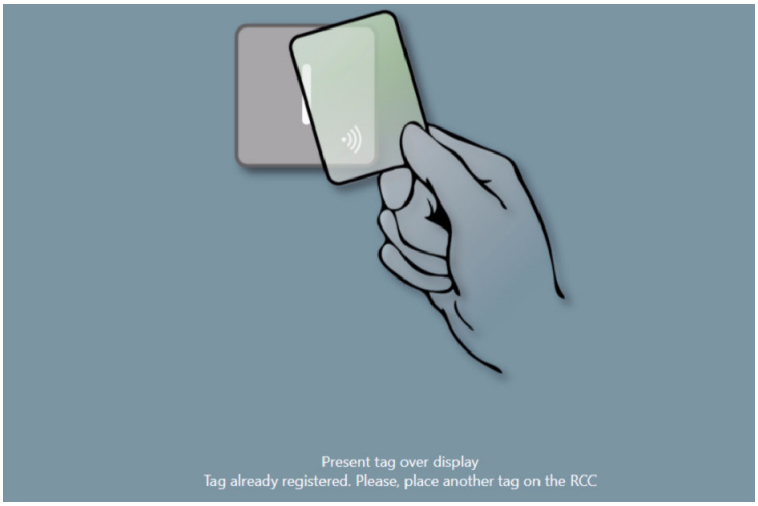
ADDING A NEW TAG

1. Press on the “Add tag” button. Swipe the RFID card through the RCC reader to register the tag, according to the instructions in the new window displayed.

Illustration 2-127
Add Tag Window

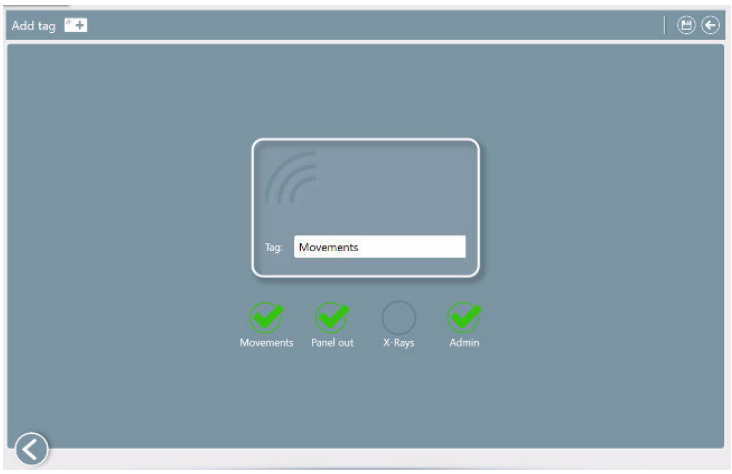
Note ☞ *If the entered card is already included in the RFID tag record, the following message will be displayed.*

Illustration 2-128
Tag Already Registered Message



2. In the next window, the tag name and the user's access privileges, can be defined.

Illustration 2-129
Tag Edition Window



Depending on the system permissions assigned to the tag (RFID Card) in this window, the user can perform the following actions:

- **Movements:**

  It allows the user to drive the system in Parking position.

  When the system is out of the Parking position, it allows the user to move the Column and the Arm in order to put the system in parking position.

- **Panel Out:**

  It allows the user to unlock the system from the Parking position and to move the Arm and the Column in order to get access to the Detectors.

- **X-Rays:**

  It allows the user to perform any action needed for Radiographic Operation.

- **Admin:**

  It includes all the previous permissions for Movements; Panel Out, Radiographic Operation, and the facility to access the Administrator Menu.

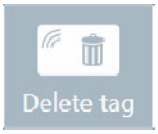
Note ☞ *This system is intended to share the RFID Card Management with the Acquisition Software.*

3. Press the “Store” button to register the tag. If the registration is successful, a message will be displayed in the previous window.

Illustration 2-130
Registration Confirmation Message

4. Now it is possible to register another tag or press the “Previous Step” button to return to the Tag Admin menu.

5. Press the “Back” button to return to the main menu.



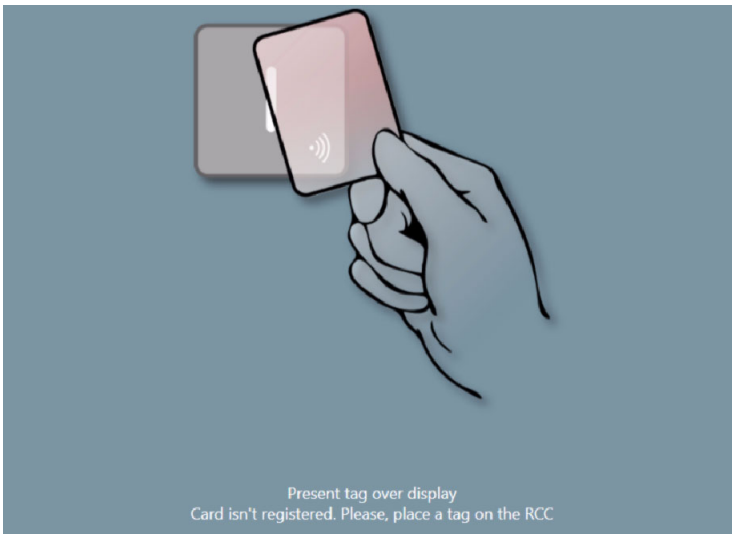
DELETING A TAG

1. Press on the “Delete tag” button. Swipe the RFID card through the RCC reader to unregister the tag, according to the instructions in the new window displayed.

Illustration 2-131
Delete Tag Window

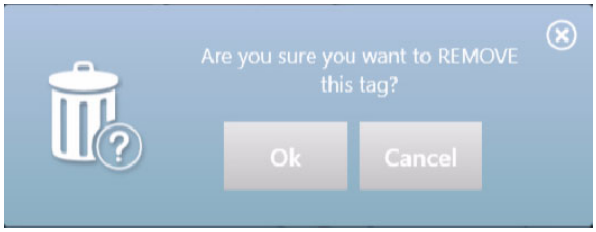
Note ☞ *If the entered card has not been previously registered in the RFID tag record, the following message will be displayed.*

Illustration 2-132
Tag Not Registered Message



2. A pop-up window requests confirmation of the tag unregistration.

Illustration 2-133
Confirmation Window of the Tag Removal

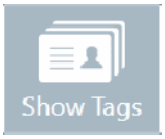


3. Press the “Store” button to finish unregistering the tag. If the tag deletion is successful, a message will be displayed in the previous window.

Illustration 2-134
Tag Deletion Confirmation Message

4. Now it is possible to delete other tag or press the “Previous Step” button to return to the Tag Admin menu.

5. Press the “Back” button to return to the main menu.



EDITING A TAG

Press on the “Show tags” button to display a list of the different tags with the name and permissions with which they were registered.

This window displays, for each tag, a text box with the name registered and the permissions assigned to it (Movements, Panel out, X-rays, Admin, Service, RFID Tag ID and Sync). Assigned permissions are represented with a green check mark, while those that have not been granted are shown with a red ban icon.

Illustration 2-135
Show Tags Window

The “Synchronization” icon is used to indicate that the tag is also registered in the Acquisition Software.

Note ☞

If the tag is registered in both the Acquisition Software and the local database, it should be deleted from the first one to maintain synchronization.

Deleting a sync tag from this window may cause inconsistencies in the system.

The code displayed in the ”RFID Tag ID” column would allow the RFID Card to be identified in the Acquisition Software.

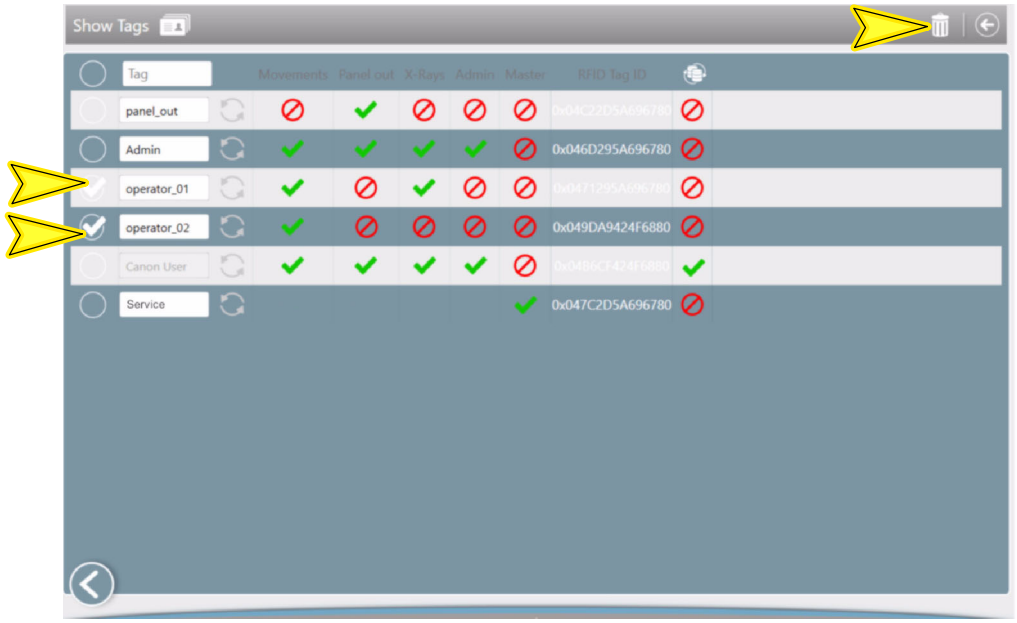
REMOVING MULTIPLE TAGS

1. From the “Show Tags” menu, multiple tags can be selected to be removed. Select one or more Tags by pressing on its corresponding radio button.

Note ☞ *The radio button on the first row allows to select all the listed tags.*

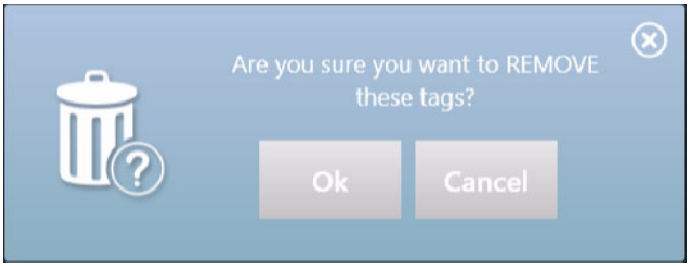
2. Once selected, press the “Trash” button to proceed.

Illustration 2-136
Removing Tag(s) - Selection and Trash Button



3. A confirmation message appears on screen. Press “Ok” to confirm.

Illustration 2-137
Removing Tag(s) - Confirmation Message

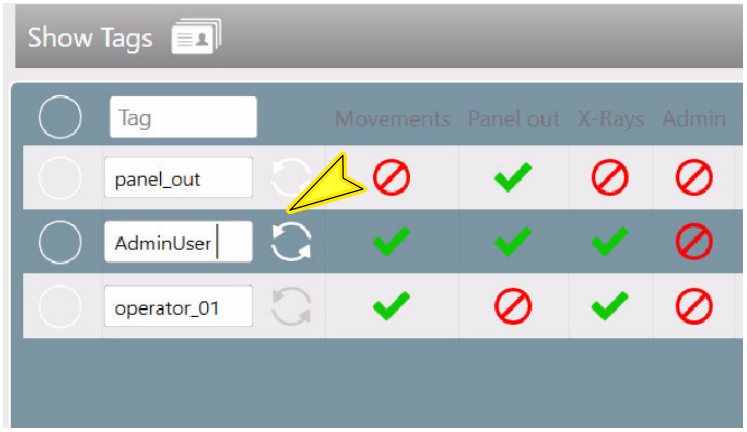


RENAMING TAGS

From the “Show tags” menu, each tag can be renamed.

1. Press on the text box of the tag name.
2. Use a keyboard to enter a new tag name.
3. Once renamed, press on the “Update” button.

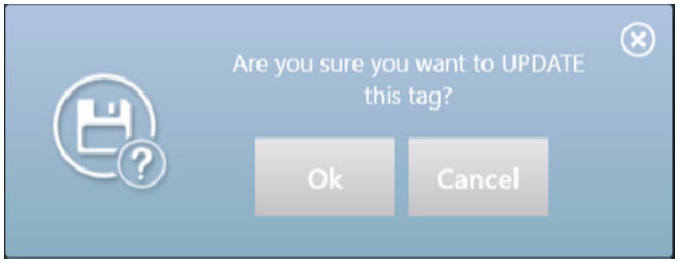
Illustration 2-138
Renaming Tag



Note ☞ *When a green check mark is related to the “Synchronization” icon, renaming that tag is not allowed.*

4. A confirmation message appears on screen. Press “Ok” to confirm.

Illustration 2-139
Renaming Tag(s) - Confirmation Message



5. Now it is possible to rename/delete other tag or press the “Previous Step” button to return to the Tag Admin menu.

6. Press the “Back” button to return to the main menu.