



Ultrasound Solutions



SDT270 TankTest

USER MANUAL

WARNING

POWERED BY BATTERY

BATTERY IS NOT USER SERVICEABLE

CHARGE IN A NON-HAZARDOUS AREA

WARNING: NO USER SERVICEABLE PARTS INSIDE – REFER SERVICING TO QUALIFIED PERSONNEL

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

You can download the latest version of this manual by visiting the SDT International website:
sdtultrasound.com

- Due to typical self-discharge of NiMH batteries, it is recommended to charge the SDT270 battery at least every 3 months, even if it is not used.
- To check your SDT270 version, please refer to the chapter "**System Info**".
- Your SDT270 device proposes both text and icon interfaces. This manual describes only the icon interface. To switch between icon and text interface, consult the topic **Switch between icon and text interfaces**.

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1 SDT270 ATEX version



Please read carefully the safety precautions before using the SDT270 - ATEX version in a potentially explosive environment.

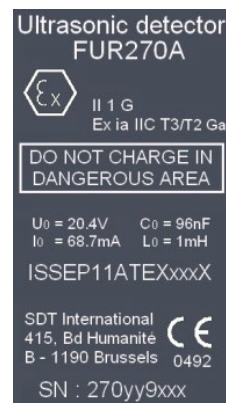
1.1 Specific safety precautions for SDT270 ATEX version



- *Make sure your SDT270A protection class is suited regarding the environment it will be used.*
- *Under no circumstances, do not attempt to service or replace SDT270 ATEX version components. In case of malfunction, contact SDT International or SDT local representative.*
- *Maintenance must always be performed outside potentially explosive environments.*
- *When using the SDT270 device, the only authorised power source is its internal battery. Using the charger is strictly forbidden.*
- *Battery charge must exclusively be performed outside potentially explosive environments.*
- *Do not use USB connectivity in dangerous area.*
- *Do not use SDT carrying case in dangerous area.*
- *Potential danger of static electricity for the display. Avoid electrostatic charge:*
 - *Avoid friction.*
 - *No dry cleaning.*
- *The max. permissible room temperature is:*
 - *-15°C to 48°C for T3.*
 - *-15°C to 60°C for T2.*

1.2 ATEX marking

The SDT270 ATEX version is recognizable by its specific marking located in its back plate:



1.3 ATEX classification

The SDT270A ATEX version is classified  II 1 G Ex ia IIC T3/T2 Ga.

1.4 SDT Sensors for SDT270 ATEX version



The SDT270 is working with all SDT Sensors, but only the Flexible sensor ATEX and the TTS1 and TTS2 TankTest sensors can be used in hazardous areas.

2 Charging the battery

If you have just taken your SDT270 and this manual out of the box for the first time, please put your 270 on charge now.

The SDT270 uses an internal NiMH battery. The battery charger outlet will connect to a socket on the rear side of the 270.



Battery charge of the SDT270 ATEX must exclusively be performed outside potentially explosive environments.



Only use the charger provided by SDT.

When the battery is charging, the green Led of the charger flashes evenly.

The charging time will typically be 6 hours. When the green Led of the charger is continuously lit, the SDT270 battery is completely charged.

Like most batteries these days, leaving the 270 charging after the charger says it is charged does not hurt the battery – in fact it very slowly tops the charge up a little more.



You can charge the SDT270 switched off. You can also trickle charge the SDT270 switched on, so you can be using it to load and unload data, for example, and charge it at the same time.



SDT270 rear side



SDT270 with its battery loader

2.1 SDT270 autonomy

A fully charged battery will give you about 8 hours of continuous use. This will vary of course depending upon your need to use the backlight and the power drain of certain external sensors that you might be using.



- You can increase the autonomy by more than 20% by disabling the LAN when your device is not connected to a network Check out Network setting chapter to find how to disable LAN function.**
- You are able also to set an Auto Power Down and a time before switching off the backlight.**

3 Turn on & turn off the SDT270

3.1 Turn on

To turn on the SDT270, press the **Power button** on the bottom right of the keypad. The status LED shines bright blue and then seconds later you will see on the screen the message “System boot up”. If you do not see this display your battery might be flat.

3.2 Turn off

To turn off the SDT270, push the **Power button** on the bottom right of the keypad. You will see the following screen:



Press enter to shut down or another key to continue” on the screen. Press the **Enter button** to shut down the device.

4 Plug & unplug a sensor

The SDT270 has two measurements channels for external sensors:

- The first one is equipped with a black collar. This connector is meant for the black TankTest sensor (emerged sensor) It corresponds to the “TTB2” choice on the display.
- The second one is equipped with a red collar. This connector is meant for the red TankTest sensor (immersed sensor) It corresponds to the “TTR2” choice on the display.

The connections for external sensors are LEMO connectors. They are a commonly used industrial connector, considered for their reliability and their robustness. They have a sprung-loaded knurled barrel and mechanical polarisation to go only in one way round.

4.1 To plug a LEMO connector:

- Line up the red dot on the plug with the red mark on the connector.
- Insert the plug into the connector without any rotating movement.

When an external sensor is connected to the SDT270, it is automatically selected. However, you can switch between available sensors using the F1 button.



Both TankTest sensors can be connected simultaneously on the SDT270. The F1 button allows switching between both sensors.



Black LEMO
Red LEMO

4.2 To unplug a LEMO connector:

- Move up, towards the cable, the ring located on the bottom of the plug.
- Only pull the connector without any rotation.

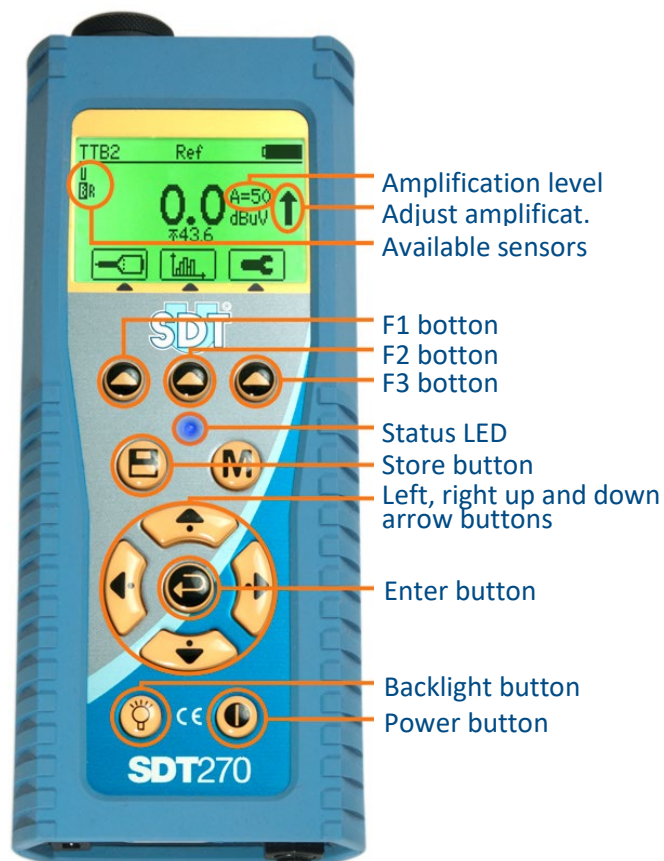


Please, never pull on the cable itself.

5 Keyboard functions when taking a measurement

- F1 to select a sensor.
- F2 to select a measurement type
- F3 to adjust the settings for the sensor in use.
- Disc button to save measurements.
- M button to start the measurement acquisition.
- Up and down arrows to increase and decrease amplification.
- Left and right arrows to decrease and increase the audio volume of the headphones.
- Enter to access to the menus.

Note: Depending on the selected sensor and the selected measurement mode, screen information can be slightly different. However, the indications and key functions remain the same in each mode.



6 Measurement and acquisition modes

6.1 Reference mode

- *In this mode the SDT270 continuously displays the measured value from the selected sensor. The value is updated four times per second.*
- *This mode also allows you to record the background noise of the system at atmospheric pressure during a time-lapse defined by the operator.*
- *The reference value is the RMS value calculated on the basis of one measurement per second during the operator defined time-lapse.*
- *The operator must make a separate reference value for the black sensor (emerged) and red (immersed).*
- *It is possible to save multiple baselines for each test and for each sensor.*

The reference mode is the default mode of the device after it starts. In this mode, the device continuously displays the measured value for the selected sensor. The measured value is updated four times per second.

6.1.1 Selecting a sensor

Select a sensor by pressing the F1 button.

6.1.2 Adjust the amplification

Set up amplification using Up and Down arrow buttons, till the up and down amplification adjustment indicators disappear.

When the saturation indication LED lights or blinks red, reduce the amplification (even if the amplification adjustment indicator does not indicate to do so) by pressing the down arrow button.

6.1.3 Adjust the audio level

Set up the headphone volume using Left and Right arrows.

6.1.4 Adjust acquisition time of the reference value

Press the F3 button.

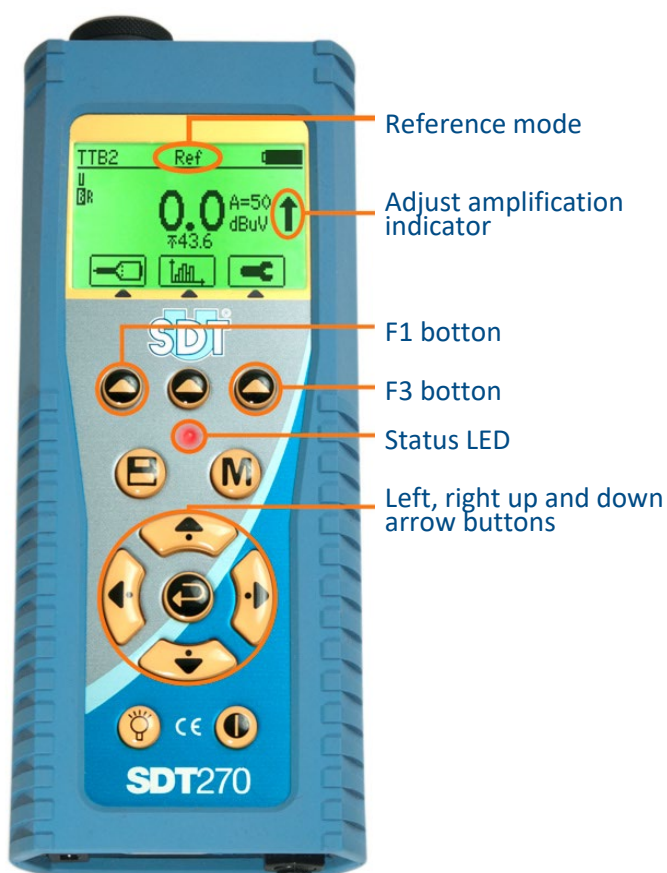
Select and then adjust the acquisition time using Up and Down arrow buttons.

Use the F1 button to save the settings as a preferred configuration

Use the F2 button to load your preferred configuration

Use the F3 button to use a one-shot configuration, without saving it.

The acquisition time is adjustable from 1 to 80 seconds.



6.1.5 Taking and storing the reference value

Press the M button.

The device acquires the measured values at a rate of one measurement per second. At the end of the acquisition time, the device displays a summary of the calculated values.

Press the Store button to store the reference value (or F1 to get back to the main screen).

Choose a memory location by pressing the up and down arrow keys, then press the Enter button.

The selected location is highlighted.

Available memory locations are from Test1 till Test100. Press the Store button to save the reference value (or the F1 button to come back to the measurement screen without saving).

6.2 Measurement registration mode

- *This mode allows taking measurements with the selected sensor when the system is under vacuum. One measurement per second is taken during the time-lapse defined by the operator.*
- *The operator has to take measurements separately for both red (immersed) and black (emerged) sensors. When the operator decides to store measurement values when the system is under vacuum, he should necessarily store the reference values.*
- *It is possible to store several measurement values for each test and for each sensor.*

After having selected the desired sensor, adjusted the amplification level and the audio volume, press the F2 button.

Using the arrow buttons, highlight the "Measurement registration mode"-icon and press the Enter button.

6.2.1 Adjusting the measurement recording duration

Press the F3 button.

Use the up or down arrow button to increase or decrease the recording duration.

Use the F1 button to save the settings as a preferred configuration

Use the F2 button to load your preferred configuration

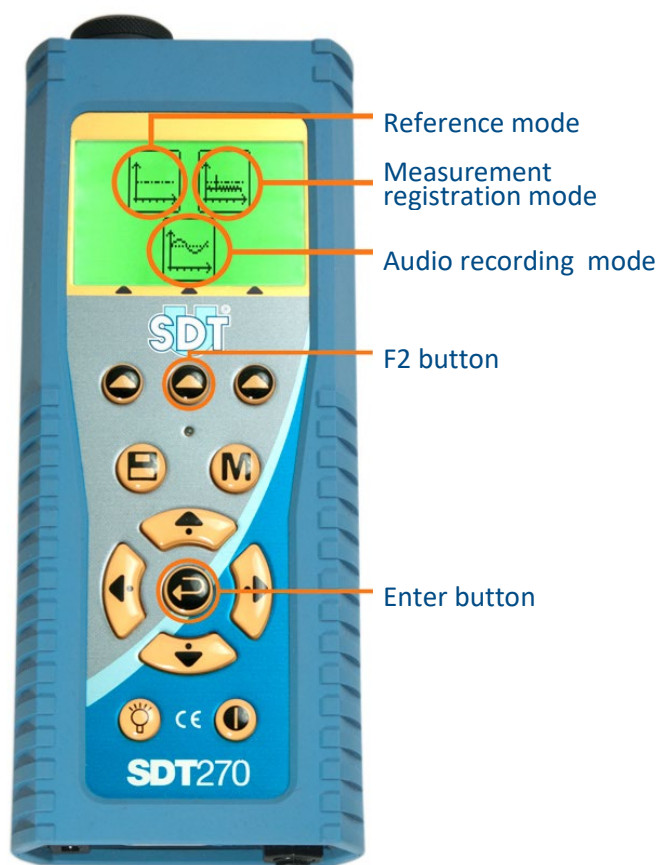
Use the F3 button to use a one-shot configuration, without saving it.

The recording duration can be adjusted from 1 to 80 minutes.

6.2.2 Storing the measurements

Press the M button to start the data acquisition

The device acquires the measured values at a rate of one measurement per second. You can stop this process by pressing the F1 button. At the end of the acquisition time, the device displays the



acquisition duration, the number of recorded values and the maximum value reached during the acquisition time.

Press the Store button to store the measurements (or F1 to get back to the main screen).

Choose a memory location by pressing the up and down arrow keys, then press the Enter button.

The selected location is highlighted.

Available memory locations are from Test1 till Test100. Press the Store button to save the reference value (or the F1 button to come back to the measurement screen without saving).

6.3 Audio file recording mode



This mode allows recording sound files. This feature is useful for example when leaks have been detected. The sound files can be wisely included in test reports. It is possible to record one or more audio files when the installation is at atmospheric pressure and when the system is under vacuum.

After having selected the sensor, set the amplification and audio volume, press F2.

Using the arrow buttons, highlight the “audio recording mode” icon and press the enter button.

6.3.1 Set the record duration

Press the F3 button.

Press the left and right arrow buttons to decrease or increase the duration of the audio file to be recorded (computation time).

Press the F1 button to save the selected duration as a preferred configuration

Press the F2 button to load your preferred configuration

Press the F3 button to use a one-shot configuration, without saving it.

The recording duration can be set from 1 to 80 seconds.

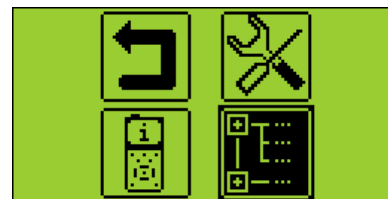
6.3.2 Storing measurements

Press the M button to start recording

At the end of the computation time, a screen detailing RMS, Max RMS, Peak and Crest factor values, is displayed. Then, press the Store button, choose the desired memory location (Test 1 till Test 100) using the Up and Down arrow buttons, open the selected location using the right arrow button, select “Ref” (for reference value audio measurement) or “Test” (for test value audio measurement) and then press the Enter button to save the data. If you don’t want to store the obtained data, press the F1 button to get back to the main screen.

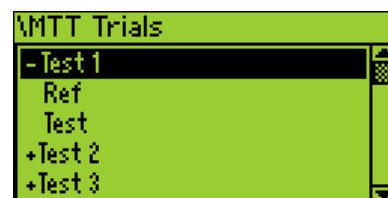
7 Viewing stored measurements and playing back audio files

Press the Enter button and highlight the Tree icon:

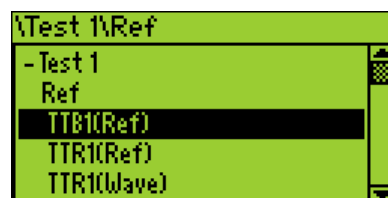


Press Enter.

Select the desired node and expand it using the right arrow button:



Choose Ref or Test and open it by pressing the right arrow button:



Then you can select a measurement (Ref or Test) or an audio file (Wave) taking using the black sensor (TTB1 or TTB2) or the red sensor (TTR1 or TTR2).

Then press the Enter button to display the list of measurements or audio files. These are ordered by date and time of recording:



Highlight the desired item.

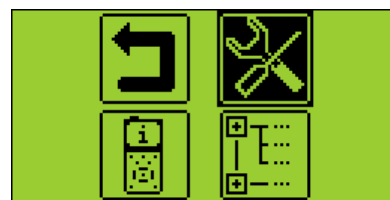
For a measurement, press the Enter button to view its details.

Press the F3 button to play a selected audio file.

To delete an audio file, press twice the F2 button.

8 Settings

To access the Main menu from the measurement screen, press Enter:



Use the arrow buttons to highlight the Settings icon:



Press Enter to access the Settings menu:

Use the arrow buttons to select the desired menu and Enter to access it.



Language icon: change device interface language (English, Nederlands, Français, Deutsch, Italiano or Español).



Date and time icon: set date, time and their format



LCD icon: adjust the screen contrast and the operating time of the backlight



Auto power down icon: adjust the time before device auto power down when it is unused



Reset icon: force a factory reset of the SDT270 device. Note that this does not erase saved measurements



Escape icon: to get back to the main menu

To modify the parameters of the selected setting:

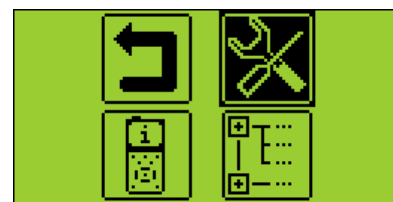
- Use the Up and Down arrow buttons to switch form one field to another.
- Use the Left and Right arrow buttons to modify the value of the selected field.
- Use the Enter button to save the changes and return to the previous menu.
- Use the F1 button to go back to the previous menu without saving the changes.

9 Switch between icon and text

To access the Main menu from the measurement screen, press Enter.

Use the arrow buttons to highlight the Settings icon.

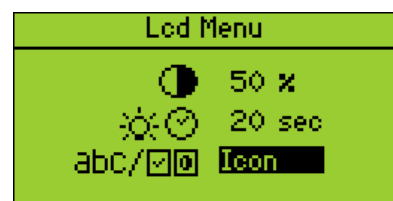
Press Enter to access the Settings menu.



Then highlight the LCD menu and press Enter.



Select the last field using the left arrow key and switch between icon and text interfaces using the up or down arrow keys.



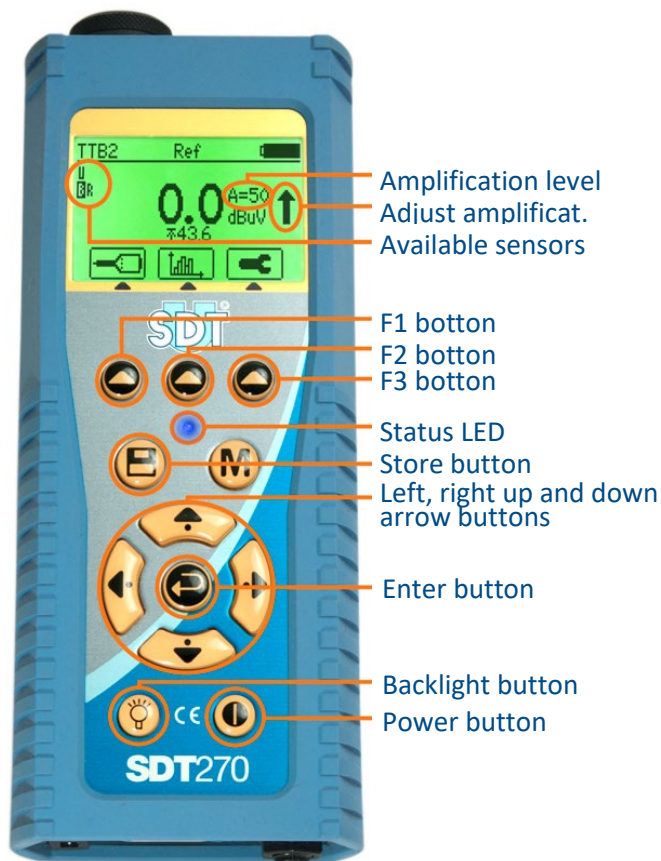
10 Keyboard functions when navigating inside the menus

F1 to come back to the previous menu.

Left and right arrows to select the previous or the next field.

Up and down arrows to change the value of the selected field.

Enter to validate your choice and come back to the previous menu.



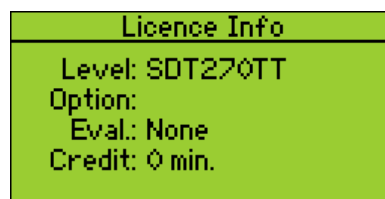
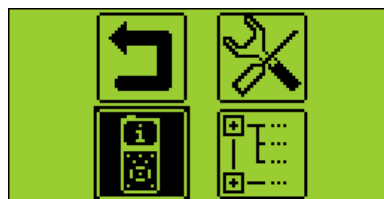
11 System info

From the Measurement screen press Enter.
Press the Down Arrow to highlight the System Info Menu icon.

Press the Enter Button to access to it.

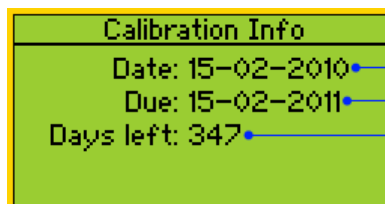
The first screen provides:

- The SDT270 Version.
- Eventually if your device is temporary upgrade to a higher Evaluation Version.
- The Credit Time before the expiry of the Evaluation Version.



Press the Down Arrow button to access to the next screen which indicates:

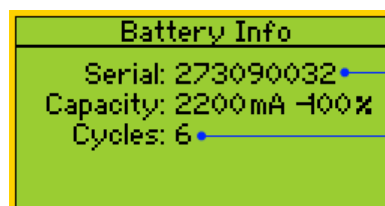
- The last Calibration date
- The recommended next Calibration date
- The remaining days before the end of valid Calibration.



Last Calibration date
Next Calibration date
Remaining days

Press the Down Arrow to access to the third screen which provides:

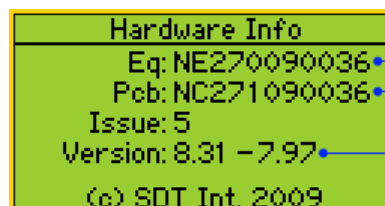
- The battery Serial Number.
- The number of load cycles.



Battery Serial Number
Load cycles

Press the Down Arrow, to access to the fourth screen which indicates:

- The SDT270 Serial Number.
- The PCB Serial Number.
- The SDT270 Firmware Version.



SDT270 Serial Number
PCB Serial Number
Firmware Version

An additional screen provides the percentage of memory used for Static and Dynamics Measurements.

Press two times F1 to return to the measurement screen.

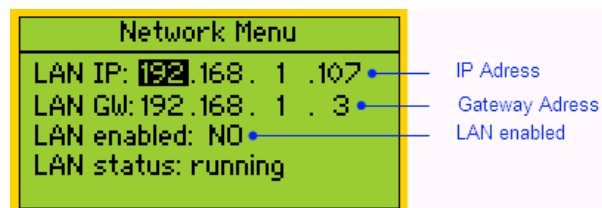
12 Network settings

When your SDT270 is not connected to a Network, it is advised to parameter the LAN to disable. This setting permits to increase the battery autonomy of more than 20%.



Use the Right Arrow to highlight the LAN enabled field, then using the Up Arrow set the field to NO.

Set the field to Yes when you want to connect your SDT270 to a network via the Lemo15 socket.



13 Recommended calibration intervals

SDT recommends annual recalibration of SDT instruments and annual verification of sensors. This periodicity is coherent with the observed long-term stability of SDT electronic equipment's.

However

- For new equipment leaving the factory the initial period is extended to 15 months instead of 12 (to avoid any possible discrimination between users due to transportation time, customs clearance, etc.)
- SDT recognizes that each customer may have their own Quality Assurance Standards and internal requirements. If a customer has established a Quality Assurance Program that includes a documented procedure for measurement deviations, and if an instrument and the relevant sensor show acceptable deviations and do not show signs of physical damage, then calibration periodicity could be extended to two years.
- Third party organizations having more authority (Class, or State Administrations) may have defined their own regulations for example 6 months, or 2 years calibration interval: by evidence, local legally applicable regulations supersede SDT rules.

For these reasons, SDT Calibration Certificates do no more mention a "calibration due date", but simply the "last calibration date".

For user convenience, the date of the last calibration of an SDT200 or 270 instruments can also be found in the menu screens.

This text refers to SDT document DC.QUAL.005¹.

¹ This document is part of SDT's quality management system (ISO-9001 certified).

14 Declaration of conformity

To consult the latest version of this document, please visit <https://sdtultrasound.com/support/downloads/certificates/>

15 Warranty

SDT International guarantees the SDT270 unit against manufacturing faults for a period of 2 (two) years, with the exception of the battery and accessories (charger, headphones, sensors, etc.) these are guaranteed for a period of 6 (six) months. The warranty covers all material supplied and implies the free replacement of all parts that contain a manufacturing fault.

Warranty does not include shipping, handling and importation.

The warranty is void if misused, or accident damages the product, if the product is altered in any way, if an unauthorized party attempts repair, or the unit is opened without written authorization of SDT International.

In the event of a defect, contact your local SDT representative or SDT International.

16 Responsibility limits

Neither the company SDT International, nor any related company, will in any circumstances be liable for any damages, including, without limitation, damages for loss of business, business interruption, loss of information, defect of the SDT270 unit or its accessories, bodily harm, loss of time, financial or material loss or any other indirect or consequential loss arising out of the use, or inability to use this product, even when it has been warned of possible damages.

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The information herein is believed to be accurate to the best of our knowledge.

Due to continued research and development, specifications of this product can change without prior notice.