Ultrasound Solutions

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SDT340: Best practices for battery maintenance and longevity

Preamble

Thank you for acquiring the SDT340 kit. This guide outlines the recommended procedures for optimizing the performance of your measuring equipment's battery to ensure an exceptional user experience.

Your SDT340 is equipped with a removable, rechargeable Ni-MH battery with a nominal capacity of 3 600 mAh. All battery packs are assembled by SDT and subjected to rigorous testing through multiple complete charge-discharge cycles to ensure optimal performance. Each battery is equipped with an internal memory and temperature sensors. Your SDT kit also includes a docking station along with its power supply for convenient battery management.

To guarantee the safe and efficient use of NiMH batteries with your equipment, it is essential to follow these precautions. Always refer to our specific instructions and guidelines provided with your instrument for further details on battery usage and care.

For additional information, you can find more details on SDT's website:
https://sdtultrasound.com/support/downloads/

You can also explore further insights on battery-related topics that have influenced the creation of this guide by visiting:
https://data.energizer.com/wp-content/uploads/2020/11/nimhhandbook_ver2-2.pdf

1. Note on the battery pack

The removable battery pack of the SDT340 is of the Nickel-Metal Hydride (NiMH) type. NiMH batteries are commonly used in many electronic devices due to their energy storage capacity and rechargeability. Be sure to follow the precautions and specific instructions for using NiMH batteries to ensure their proper operation and longevity.

The battery pack consists of two 4-cell sub-packs, each delivering a nominal voltage of 4.8 V (up to ~5.6 V when fully charged).

The primary advantage of this battery type is its cycle life. According to Energizer, NiMH batteries used in appropriate conditions can be recharged hundreds of times, equivalent to using numerous alkaline batteries over their service life.

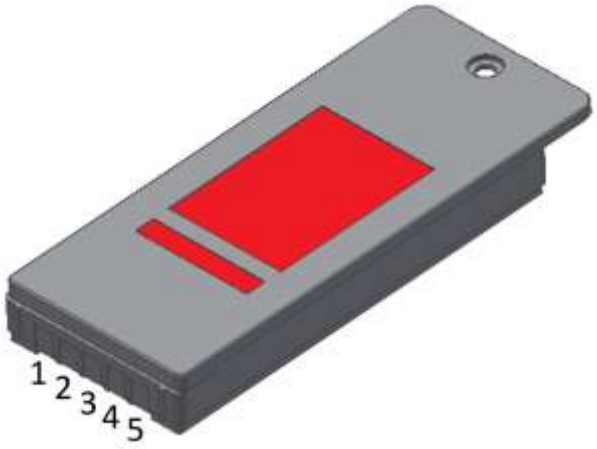
Only use battery packs that are compatible with your equipment. Using the wrong type of battery may lead to damage or malfunction.

Do not open the battery pack. Opening a battery pack can expose you to the internal components, which may include hazardous materials or chemicals. It can also void any warranties or guarantees associated with the battery pack. If you encounter issues with your battery pack, it's best to follow this guide and contact us for assistance.

Please follow the precautions and specific instructions for using NiMH batteries to ensure their proper operation and longevity.

Customer usage can significantly impact the battery's lifespan. The expected lifespan is two to five years, depending on your use.

Be aware that the capacity of NiMH batteries may decrease over time and with repeated charging cycles. Replace batteries that no longer hold a charge or exhibit reduced performance.



Position	1	2	3	4	5
Name	VCHAN2	GND	BAT+	COM	VCHAN1

A voltmeter can be used to measure the voltage V23= V[GND-BAT+], for basic diagnostic purposes:

- After a charge, normal voltage values V23 should be in the range [5.2 V, 6 V], depending on the battery state.
- If V23 is below 5.2 V, the battery pack is considered "faulty". The SDT340 will not start properly even if the boot screen displaying the gauge might appear. A typical symptom associated with insufficient voltage is incessant restarting. If this happens, the battery must be replaced.

2. Note on the docking station

SDT has developed a dedicated docking station following best practices to ensure efficient recharging and extend battery life.

We'd like to emphasize that the docking station as well as the battery pack should also be periodically returned to us as part of the equipment's calibration process under our lifetime warranty program. Each docking station undergoes a thorough inspection, testing, and any necessary updates to maintain reliability and performance.

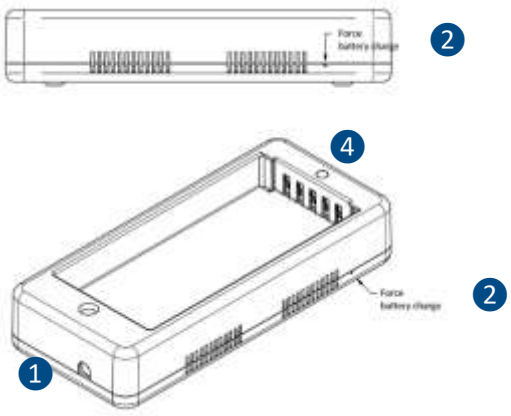
The charging station comes with a power supply (AC/DC converter, 12 V). Always ensure you use the one provided with your equipment.

Here are the steps for using the charging station:

1) When powered ❶, the charging station emits a beep and enters "waiting for a battery to charge" mode, indicated by the LED flashing blue ❹.
2) Insert a battery into the battery compartment ❸. If the battery is detected, a beep will sound, and the LED will remain continuously blue for a few seconds.
   (a) Normal recharging begins, indicated by the LED flashing green.
   (b) If the battery is not detected. Remove the battery from the docking station, inspect it and clean the contact points on both sides, then attempt again.
   (c) If the battery is still not detected, under certain circumstances, particularly after an extended period of non-use, a forced charge can be initiated by inserting a needle into the "force battery charge" location ❷ while the battery is installed in the docking station. This mode is indicated by the LED alternating between flashing green and blue.

3) Once the LED remains steadily green, the battery is fully charged. The recharge time is approximately 7 hours.

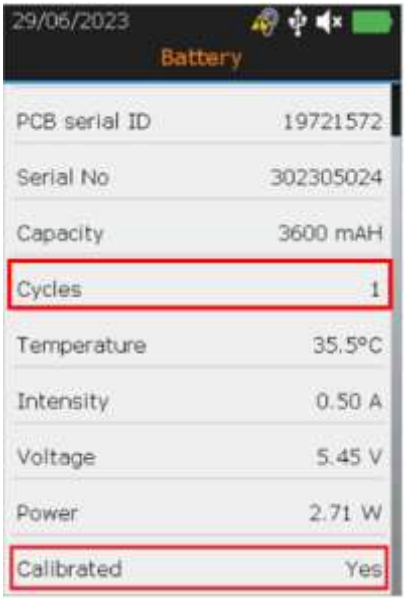
The docking station is equipped to detect abnormal current consumption or temperatures. When such issues are detected, the LED will flash red. To reset it, simply disconnect and then reconnect the power supply to the main. If these issues recur, it is possible that your battery may have an anomaly. For safety reasons, the docking station is equipped with a fuse.



❶ Power supply connector
❷ Force battery charge location
❸ Battery locked in the docking station
❹ Docking Station LED

3. Important recommendations:

- **Battery Discharge and Self-Discharge Rate:** All batteries naturally lose charge over time, whether they are actively used or not. Due to the typical self-discharge rate of NiMH batteries, it is advisable to recharge the battery at least every three months using the provided charger pack. As per Energizer, the self-discharge factor typically results in a drain of approximately 50% to 80% of the nominal capacity after 12 months of storage.
- **Storage Conditions and Their Impact:** The conditions in which you store the battery can affect the self-discharge rate. For optimal storage:
    - Keep the battery at an ambient temperature, ideally between -20°C to 30°C.
    - Store the battery in a clean, dry, and protected environment to prevent corrosion.
    - Store the battery open circuit, disconnected from the data collector.
    - Keep the battery in a charged condition.
    - Minimize the time spent in storage. If you have two batteries, alternate their use with the data collector.
- **Restoring Capacity:** Batteries stored for extended periods or exposed to high temperatures may require more than one charging cycle to fully restore their capacity.
- **Partial Recharges:** Limit the number of partial recharges and aim for periodic full charge cycles to enhance performance and ensure accurate battery gauge estimation.
- **Perform periodic full charge cycles:** This practice enhances performance and ensures proper battery gauge estimation.
    - Starting from the latest SDT340 Update Package version 2.1.691, the SDT340 displays the number of full charge cycles stored in the memory of the battery's memory. You can find this information in the menu under "Settings" > "System info" > "Battery", as shown below:



Only complete cycles are counted. A complete recharge cycle is recommended when status "Calibrated" displays "No". If so, use the SDT340 until you receive the low battery message "***Low battery The device will shut down. Please recharge your device"***. Once this message appears, the equipment will automatically power off a few minutes later. To prevent auto power-down during this discharge process, you can disable the "Auto power Down" mode, in the menu by navigating to "Settings" >"Auto power down". Remove the battery, place it in the docking station for a complete cycle (for further details, please refer to the user manual).

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01	CMA 26/10/2023	Original version	MCD
Rev.	**Writer**	**Nature of modification**	**Approved**

The information herein is believed to be accurate to the best of our knowledge.
Due to continuous research and development, specifications are subject to change without prior notice.