

# WHEN SHOULD YOU CHANGE A SPORTident STATION BATTERY?

The decision to change a battery used to be based on the percentage indicator in the station. SPORTident now recommend that you monitor battery life using the voltage indicator. SI-Config and Config+ both display the voltage and if you turn the station on with a Service/Off key the LCD will scroll through various readings and one is **BATnnn** where **nnn** is 100 x voltage. As an example, **BAT316** is **3.16 volts**.

- You should change a battery when the voltage falls below **3.10 volts** – a reading on the LCD display of **BAT310**
- When the voltage falls below **3.0 volt**, the station will beep 4 times whenever a card is dipped in the station
- A station firmware upgrade consumes about **0.5%** of the battery power and the voltage can reduce significantly during the upgrade. It is best to turn off the station, wait for about fifteen minutes and then turn it back on. The battery voltage should have returned to a similar value to before the upgrade.

**However – things are never quite that simple!**

## Passivation

Lithium batteries are affected by a phenomenon known as passivation. If a station has not been used for a few months, the battery will not be delivering as high a voltage as it is capable of. The station should be switched on for 15-30 minutes using a **standard SI-Card**, not a purple Service/Off key. Now switch the station off, then on with the purple Service/Off key. You will see in SI-Config/Config+ and on the LCD display that the battery voltage has increased to the correct level.

## Invalid Voltage Readings

You should be seeing a voltage displayed between **2.60V – 4.60V**. This is a valid voltage. If you see a voltage of exactly **3.00V** it is very likely but not guaranteed that this is an incorrect battery voltage. If you see a voltage of less than **2.60V** which means that you will be hearing 4 beeps each time you dip an SI-Card, this is **DEFINITELY** an incorrect voltage. In both cases switch the station off then on again with the Service/Off key to see if a sensible voltage is now displayed.

If you are still seeing an invalid voltage, please use SPORTident Config+ software to reset the station to its factory defaults. To do this click **Commands -> Reset Device to Factory Defaults**. You will need to re-program the station so that it has the correct Mode and code.

## Sending Stations to Us For A Battery Replacement

Only send us stations if the voltage is less than **3.10 volts**. To avoid the need to send us batches of stations too often, you could set your threshold at **3.20 volts** but if you send us stations with voltages much higher than **3.20 volts**, you could be changing the battery at least a year too early!

- Replacing a battery/sealing ring in BSF7/8 Station - **£13.13**
- Replacing a battery/sealing ring in BSF8 Station with metal bottom plate - **£15.13**
- Out of warranty BSF7/8 station repair - **£20.00**

**VAT @ 20%** should be added to the prices above. Turn round time should be no more than 10 days from date of receipt unless the station needs to be returned to our manufacturer. Carriage is charged at **cost**.

### Background Information About Passivation

Passivation is a film of lithium chloride (LiCl) that forms on the surface of the lithium anode, and it serves to protect the lithium from discharging on its own when the load is removed from the cell. The film of LiCl, which is essentially a high resistance layer between the electrodes, is primarily responsible for the long shelf life of lithium cells.

Passivation may cause voltage delay after a load is placed on the cell as illustrated in the graph.

After a load is placed on a cell, the high resistance of the passivation layer causes the cell's voltage to dip. The discharge reaction slowly removes the passivation layer thereby lowering the internal resistance of the cell. This in turn causes the cell's voltage to reach a peak value which should remain steady if other discharge conditions do not change. If the load increases after the cell's voltage stabilizes, then it may dip again until the passivation layer is sufficiently removed. Once the load is removed or lowered, the passivation layer will reform, and voltage delay may be a factor when subsequent loads are applied.

