

Tech Publication

Topic: - Battery life compromised by passivation.

Application: - Data Logging and water management

Background: - The STS Datalogger (DLN70) has long been supplied with a 3.6 V Primary lithium-thionyl chloride (Li-SOCl₂) battery. As a feature, this type of battery creates an internal passivation layer when made to increase its shelf life in storage, this can be made stronger due to storage in higher than room temperatures (23°C). This layer would usually burn off quite quickly under normal load conditions however the DLN70 only draws a very small amount of current when in stand-by mode (to increase battery life to that expected from a data logger). The combination of these two facts mean the passivation layer remains intact after storage and the battery 'goes flat' prematurely.

Solution: - By placing the battery under load for a short amount of time after storage, the passivation layer can be removed and the battery will reach its expected life span. There are a couple of ways to do this.

1. A Depassivator (picture below). Simply place the new battery in the Depassivator and switch on for 20 seconds (Simplified full procedure available).
2. An 82Ω (±5%) resistor across the terminals for 20 seconds. Causes a current of 44mA similar to that caused by the Depassivator and slightly below the 50mA maximum recommended continuous current rating of the battery
3. This is done internally with the New DLOCS data-loggers from STS. They do internal depassivation as required, the battery has also been moved into the submersible section to remove copper losses in the cable and maintain battery temperature. This adds up to Battery lifetime at 1 measurement per hour in a temperature range between 0 and 40°C is estimated to be >10 years.

