

# SOLINST TECHNICAL BULLETIN

## Understanding Battery Life

### Levellogger Batteries

All Solinst Levelloggers use a lithium battery as their power source. Levellogger battery life estimates are based on standard operating conditions, with no external or internal interferences (i.e. under ideal conditions).

The estimates are based on a set sampling rate. For example, the Levellogger Edge has a battery life estimate of ten years, based on a sampling rate of one reading per minute. Below is a table showing standard battery life estimates for each Levellogger type.

Battery Life Estimates			
Levellogger & Barologger Edge 	Levellogger Junior Edge 	LTC Levellogger Edge 	Rainlogger Edge 
10 years based on 1 reading per minute	5 years based on 1 reading per minute	8 years based on 1 reading every 5 minutes	Approximately 10 years typical

A more rapid sampling rate will deplete the battery more quickly. For example, if a Levellogger Edge is set in Continuous Mode (loops and overwrites data when memory is full) at a sampling rate of 1 second, the battery will be drained in about 4 months. If a Levellogger Junior Edge is used at a sampling rate of 5 seconds, the battery will be depleted in approximately 2.5 months.

It is also important to note, in Event Based sampling, although the Levellogger may only log readings in memory when an "Event" occurs, the battery consumption is still mainly a function of sampling rate. This means that a smaller sampling interval (checks for an Event occurrence) will consume battery power more quickly whether readings are stored or not.

### What Else Can Affect Battery Life?

In addition to sampling rate, there are other internal and external factors that can have an impact on battery life. Levelloggers have a specified operating temperature range; the Levellogger Edge has an operating range of -20°C to +80°C. Exposure to the temperature extremes can adversely affect the battery life.

**Note:** Loggers should always be stored or installed with the top hanger cap on (if not using a Direct Read Cable) to prevent unnecessary battery drainage and protect the optical eyes.

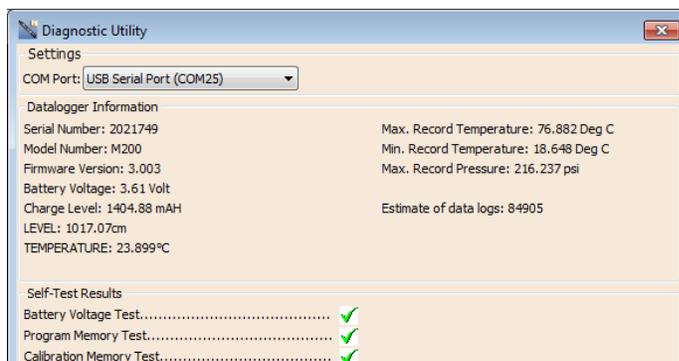
There could also be an internal electronic component failure or an issue during a firmware upgrade, which could cause a short, or the Levellogger system to get stuck in an operational loop. This leads

to battery drain. A leak that reaches the inside components of the Levellogger can also cause this to happen.

Moisture on the optical eyes of a Levellogger can also be a problem during communication. Additional battery consumption will occur during any communication process, if condensation, moisture, or dirt is present on the optical eyes. Moisture and dirt impedes communication, and requires more power than would normally be required with a dry, clean connection.

### Levellogger Battery Status

The battery % consumption display on the Datalogger Settings window of the Levellogger Software, changes based on usage, type of activity, and the power consumption of the main internal components of the Levellogger. This does not take into account factors such as temperature effects on the battery. It also does not allow for inherent differences in available power between batteries in different Levelloggers. The power consumption from communicating with moist or dirty optical eyes cannot be measured within the Levellogger, therefore, the battery status cannot account for this either.



You may be able to diagnose what has caused your battery to drain more quickly than expected, by using the Levellogger Software Diagnostic Utility. The Utility will display the temperatures your Levellogger has been exposed to, an estimate of the number of logs that were taken, as well as the battery voltage and charge levels.

### Dealing with a Drained Battery

Levelloggers can be returned to Solinst for assessment and/or battery replacement. Solinst can measure the battery voltage when it comes in for assessment, but it cannot always be determined what specifically caused the battery to drain. If a Levellogger is within its warranty period, and there is no obvious misuse of the Levellogger, the repairs may be covered under warranty.

**It is rarely a low or defective battery that is the sole cause of a non-communicating Levellogger, considering so many factors can affect battery function.**