

CALSCAN

reliable
temperature pressure
& flow measurement

Badger+

Downhole Memory Recorder

The Badger is our toughest and most durable tool. Deep wells are a difficult environment for a wireline operator to work on. Mistakes happen and the Badger is designed to maximize the chance of its survival.

How tough? Customers can modify their TCP (Tubing Conveyed Perforating) drop bar and attach a Badger inline. With proper setup, nine times out of ten the tool will survive the drop and perforation.

When the tool does need service you can count on our experienced technicians to quickly diagnose and get the tool back in your hands. Turn around time is typically less than two weeks after we have received the tool at our factory in Canada.

Fault Tolerant Memory Design: The failure of one memory chip or block of memory will not result in the complete loss of a section of data.

Smart Sample: The Badger can be set to sample at a fast sample rate, such as one second, and only store if the pressure has changed by a specified amount or if a set amount of time has passed. This is useful for finding maximum pressures during medium duration tests to avoid running out of memory.

Surface Readout (SRO): The Badger can be configured to communicate via electric line to a Hawk 9000 surface recorder. This allows for quick real-time access of the data without pulling the tool.

Fast External Wet Temperature: When doing leak detection and other downhole testing tasks where response time is critical, the optional external temperature probe allows for a much quicker response to temperature changes compared to the standard internal sensor. Available standalone in a temperature only tool or as a triple sensor with pressure.

Long Term Testing: Long term battery life is highly dependent on downhole temperature. The Badger can run for a year on one AA lithium cell for downhole temperatures less than 75°C at a one minute sample rate.

High Speed Download: The Badger+ can download at 68000 samples/minute, which is over four times faster than the old Badger.

Calibration: The Badger is calibrated on a primary deadweight, not another pressure sensor. This is the most accurate and repeatable method for calibration. All tools are calibrated starting from 0°C, not room temperature. This allows accurate pressure measurements even in shallow wells where the temperature near surface is below 20°C.

Shock Resistant Design: The housing is made of durable 718 Inconel™ and designed to protect the electronics from downhole impacts.

Field Reporting: Calwin, our windows interface software allows the operator to make quick field gradient reports and custom graphing with annotation. Graphs can be saved for later editing and can be exported in PDF format.



Specifications

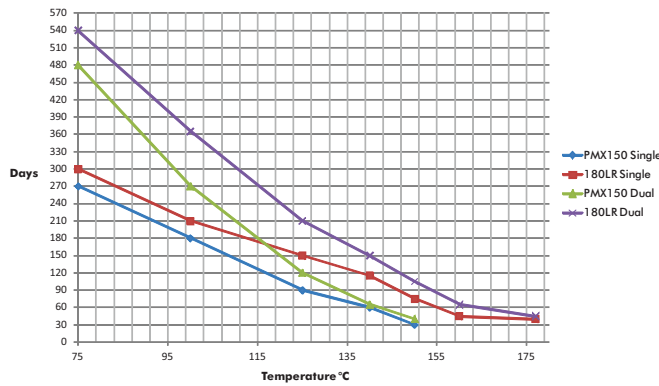
Battery

Lithium AA-Cell PMX150 for temperatures from 0°C to 150°C
 Lithium AA-Cell 180LR for temperatures from 50°C to 180°C

Battery Life

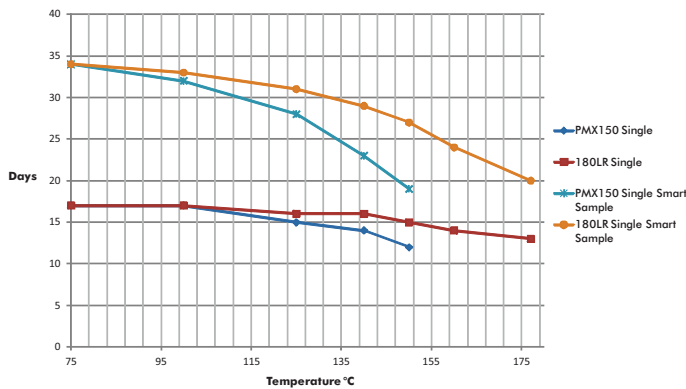
The life on a battery is temperature and sample rate dependent. Battery chemistry and downhole temperature are the dominant factors above 120°C on long term tests due to battery self discharge.

Battery Life With 30 Second Sample Rate



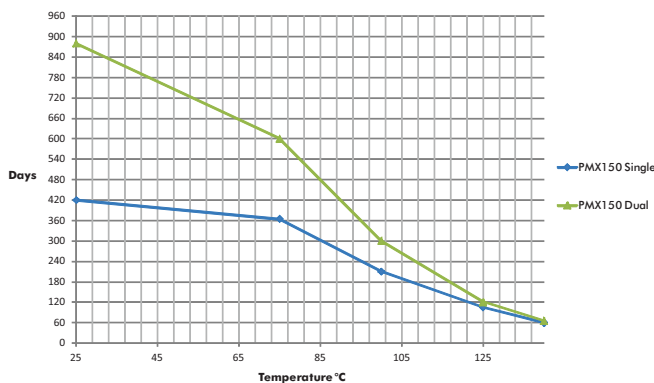
Fast samples drain the battery quickly. Consider using smart sampling to extend battery life as well as memory.

Battery Life With 1 Second Sample Rate



Long term tests of over a year are possible with one minute sample rates and temperatures less than 75°C

Battery Life With 60 Second Sample Rate



For warranty, calibration, replacement battery, and local distributor information contact:

E-mail: sales@calscan.net
 Website: www.calscan.net
 Phone: (780) 944-1377
 4188 93 Street, Edmonton, Alberta, T6E 5P5

Memory

Badger+

Standard Mode: 2 088 960 samples
 Smart Sample Mode: 1 392 640 samples

Badger+ with Triple Sensor:

Standard Mode: 1 523 710 samples
 Smart Sample Mode: 1 117 380 samples

Badger+ with External (Wet) Temperature Only:

Standard Mode: 3 352 160 samples

Sample Rate

Minimum Rate at maximum resolution: 1 sample/second
 Minimum Rate: 1 sample/0.33 second

Environmental

Temperature Range

Standard: 0°C to 150°C
 Extended: 0°C to 177°C

Sensor Specifications

Pressure

Type: Silicon Crystal, Sapphire, Piezoelectric
 Range: 750, 1500, 3500, 6000, 10000, 15000 psig
 Accuracy: ± 0.024% Full Scale for Standard Temperature Range
 Accuracy: Ask for details for Extended Temperature above 150°C

Resolution: ± 0.0003% Full Scale

Resolution during smart sample: ± 0.0012% Full Scale

Drift: Highly dependent on ambient well conditions and proper tool maintenance

< 0.005 % full scale/year for temperatures < 85°C
 < 0.010 % full scale/year for temperatures < 125°C
 < 0.024 % full scale/year for temperatures < 150°C
 Ask for details for Extended Temperature above 150°C

Temperature

Type: Platinum RTD
 Accuracy: ± 0.5°C
 Repeatability: < ± 0.02°C
 Resolution: < 0.001°C
 Drift: < 0.1°C/year

Housing

Housing Material: 718 Inconel™ (UNS N07718)
 Housing Diameter: 1.25 inches (31.75mm)
 Housing Length: 24 inches (609.6mm)

Communication:

USB or serial via Interface Box
 USB Download Speed: 68000 sample/minute

Programming and Reporting

Calwin for Windows XP/Vista/Win7

Tool Options

Extended Temperature to 177°C
 Triple Sensor with pressure and external (wet) temperature
 External (wet) temperature only