

CALSCAN

precision
temperature pressure
& flow measurement

Mole+

Downhole Memory Recorder

The Mole is Calscan's slim line 3/4" diameter gauge. Designed to maximize its chance of survival, its smaller size allows it to fit where its big brother the Badger+ cannot.

When the tool needs service you can count on our experienced technicians to quickly diagnose and get the tool back in your hands. 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 Mole+ can be set to sample at a fast sample rate, such as one second, and only store if the pressure has changed by a fixed amount or if a set amount of time has passed. Useful for finding maximum pressures during medium duration tests without running out of memory.

Surface Readout (SRO): The Mole+ 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.

Temperature Tool: When doing leak detection and other downhole testing tasks where response time is critical, the Mole+ temperature tool allows for a much quicker response to temperature changes compared to the standard internal sensor.

Long Term Testing: Long term battery life is highly dependent on downhole temperature. The Mole 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 Mole 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 pressures 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 exported to PDF.



Specifications

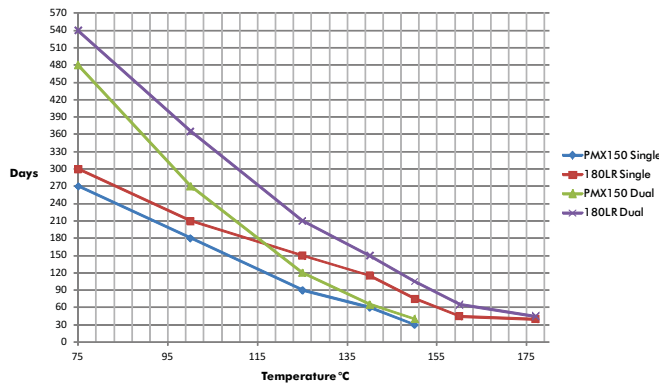
Battery

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

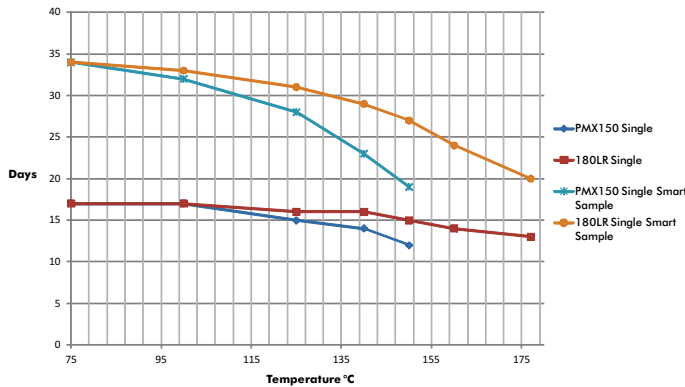
The life on a battery is temperature and sample rate dependent. Battery chemistry and downhole temperature are the dominant factors above 120°C on long term tests due to battery self discharge.

Battery Life With 30 Second Sample Rate



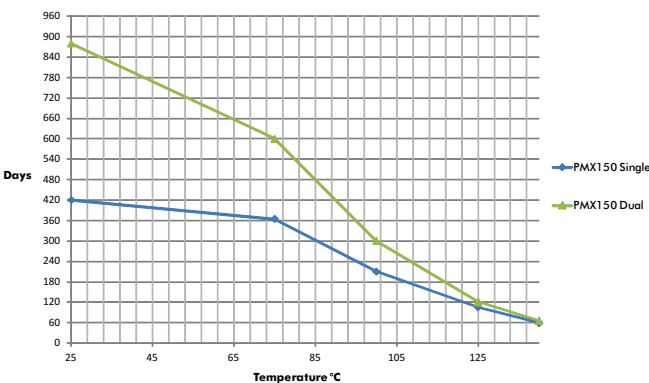
Fast samples drain the battery quickly. Consider using smart sampling to extend battery life as well as memory.

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



Memory

Mole+

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

Mole+ Temp Tool:

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: 0.75 inches (19.05mm)
 Housing Length: 12 inches (304.8mm)

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
 External (wet) temperature only



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

E-mail: sales@calscan.net

Website: www.calscan.net

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