# Frequently Asked Questions about the miniTROLL

# Q: How many data points can the miniTroll store?

A: The miniTroll Professional model can store a total of 440,000 data points consisting of 220,000 pressure and 220,000 temperature readings.

# Q: What happens when the memory if full?

A: All the In-Situ dataloggers stop recording when the memory is full. The memory does not "wrap around" and start over-writing the earlier data stored.

#### Q: What is the maximum cable length?

A: The maximum length is 4500 feet for the miniTroll and PXD series transducers.

# Q: What are the main differences between FEP (Teflon) and Polyurethane cable?

A: Polyurethane cable is used in clean water applications. Teflon is very resistant to common ground contaminants.

# **Q:** Is cable required for the miniTroll?

A: The miniTroll STND A model can be installed without cabling. Simply program the instrument, install the non-vented backshell and attach a support cable.

#### Q: What communication protocols are available for the miniTroll?

A The miniTrolls available in both RS485/232 and SDI-12.

# **Q:** Will the miniTroll fit into 3/4" well?

A: Yes, the outside diameter is 0.72".

# Q: What is the expected life span of the battery for the miniTroll?

A: 12-18 months @ 20 minute sample intervals.

# Q: Can the customer do battery replacement?

A: Yes, the miniTroll uses two standard AA batteries

# Q: Any problems associated with installing the miniTROLL in a horizontal position or does it need to be vertical?

A: The miniTroll can sit vertical or horizontal.

# Q: Is there any desiccant protection incorporated into the miniTROLL or cable?

A: Yes, the dust cap on the surface connector includes a replaceable color indicating desiccant pack. A hydrophobic membrane that will not allow water into the connector, under normal atmospheric conditions, protects the vent line.

# Q: How much deeper than your stated depth can I go?

A: The miniTroll has an overpressure rating of 2x-5x depending on the sensor range. The sensor won't be damaged within overpressure range but will not report usable data over 1x the range.

# Q: My miniTroll shows water level fluctuations that correspond to changes in atmospheric pressure. Is there something wrong with the vent line in my cable?

A: Probably not. Problems with the transducer venting system are very rare. When using a miniTroll containing a gauged pressure transducer, any changes you see in water level are most likely real. Groundwater systems exhibit varying degrees of what is termed "barometric efficiency". This means that changes in atmospheric pressure get transferred, to varying degrees, to the water in the ground. As the atmospheric pressure that presses down on the surface of the water goes up or down, the actual level of the water table in the ground may rise and fall as well. With a gauged (vented) pressure transducer, the miniTroll itself will not be affected by changing atmospheric pressure. Any water level changes that it records represent actual fluctuations in groundwater levels. The barometric efficiency of an aquifer system may be an important piece of information that is gained from aquifer testing.

# Q: What are the differences between gauge and absolute transducers?

A: Our gauge transducers, such as the miniTroll, Troll 4000, 8000 and PXD-261 are basically immune to barometric pressure changes. The design of the sensor allows for venting the "back side" of the pressure sensor diaphragm to atmospheric pressure. Therefor the "front" and "back" of the sensor see the same atmospheric pressure thus canceling out air pressure and recording only water level pressure. However, if changes in barometric pressure affect the water level, the system will accurately record the water level changes. This is the most popular sensor for general aquifer testing and surface water applications.

Pprobe =Pressure on the transducers strain gauge, Pprobe= Pw + Patm Pw =Pressure exerted by water above the strain gauge Patm =Pressure exerted by air onto the water column Pprobe= Front (Pw+Patm) - Back (Patm)

## Q: What is an absolute transducer?

A: The absolute transducer available on the miniTroll psiA, PXD-261A and PXD-461 sensors are not vented to atmospheric pressure thus records total pressure exerted on the strain gauge. These probes are calibrated to absolute zero and are commonly used to monitor water level during vacuum enhanced testing and any time well bore pressure does not equal atmospheric pressure. The absolute probe is also very effective for monitoring pipe pressure, flowing artesian wells and barometric pressure.

Pprobe=Pw+Patm

## Q: Why is the PXD-461 only available in absolute pressure ranges?

A: The intended use for the PXD-461 is high-pressure applications, 500 and 1000psiA. Barometric effects are very small relative to the pressure range and can be considered a constant, thus corrected for mathematically or by the Hermit 3000 if preferred. It is desirable to have the smallest out side diameter possible and to achieve the 0.70" OD this high-pressure absolute sensor was selected for its exceptional accuracy of 0.04% FS, repeatability, temperature stability and small diameter.

# Q: My miniTroll is recording level and temperature in meters and Celsius, how can I convert the data to feet and Fahrenheit, or vise versa? How can I convert data units from metric to English units, or vice versa?

A: Extract your data and view it in Data Manager, text format Go to settings menu and follow it down to units. Choose your measurement type and display units and hit OK.

## Q: Does the miniTROLL and/or Win-Situ automatically adjust for daylight savings time?

A: Since all countries, states or counties, do not recognize daylight savings time the Win-Situ program does not automatically adjust.

## Q: Can the Hermit 3000 program and download the miniTroll?

A: No, the miniTroll series data loggers are stand-alone units programmed and downloaded by a PC or Pocket Situ. However the Hermit 3000 and Troll series use the same software and communication hardware.

## **Q:** What batteries are available?

A: Alkaline and Lithium. Alkaline is the most common battery and is user replaceable. The lithium battery is for extreme temperature environments, -40 to 158 Degrees Fahrenheit versus 14 to 113 Degrees for the alkaline battery.

# Q: My miniTROLL exhibits strange readings when very cold. What is the cause of this and will lithium batteries help?

A: We do not characterize instrument behavior outside of the calibrated temperature range of 23 to 122 Degrees Fahrenheit. It is not simply that temperature compensation of the electronics is lost outside of our spec'd range, it is that the temperature correction behavior is not controlled outside of the spec'd range. The temperature correction is applied and optimized ONLY for our specified range. Since these are high order equations used for the correction, there is no telling what they do outside that range, and the behavior will be different for each instrument. An inflection point just outside of our specified temperature range might be beneficial to meeting our calibration requirements, but could send readings off in a wild direction outside of that range. How an individual instrument response outside the calibrated range depends on the nature of the equations used to optimize performance within the range for that particular instrument. Regardless of this, lithium AA batteries are a good idea for any instrument that will be exposed to temperatures much below freezing. This will prevent the power from dropping out and causing a stoppage in data collection.

# Q: How often do you recommend the miniTROLL be sent back for calibration check and service? What is the cost?

A: As a rough rule, an instrument should drift no more than the specified accuracy per year (0.1% full scale per year for miniTrolls). However, exposure to excessive pressure, ice formation, extreme temperatures, physical shock, or chemical deposition could all have negative effects on the calibration or actually result in physical damage to the pressure sensor. Full bench testing of the instrument and recalibration to original specifications is @ \$195. If you have particular instruments that are showing excessive drift or other problems with pressure readings, we would want to have a look at the data files. This may indicate a defect with, or damage to, the pressure sensor or electronics.

# Q: Occasionally I have problems in removing the batteries from the miniTROLL. Any suggestions?

A: Difficulty in removing the batteries can be caused by two things. The first is the type of battery used. Stay away from any batteries having the built in voltage meters. These have a larger diameter than the industry standard for AA batteries and can get stuck inside the miniTroll. Second, there may be a burr or debris on the black plastic elastomer holder at the top of the flexible circuit assembly. Cleaning with a cloth or a few strokes with a fine file around the outside of this black plastic piece should correct such a problem.

## Q: The dust cap on top of our cable sometimes is difficult to remove. Any suggestions?

A: The use of the "Bulgin" connector at the top of the cables offers several advantages over other types of connectors. Sand or dirt in the threads of the Bulgin connector cap can make removing or replacing the cap difficult, though. If you find that the threads have become damaged on any, we can send replacements. The threaded sleeve that mates with the caps can also be replaced if the threads have become damaged, but it must be removed and replaced over the bottom end of the cable. This is relatively easy on short cables, but becomes more of a chore as cable length increases.

# Q: What lubricant can I use on my o-rings?

A: Use only a silicone lubricant on all o-rings. Lubricant should be used very sparingly. Apply just enough to make the surface of the o-ring feel tacky. Excess lubricant will attract dirt and could coat electrical contacts, resulting in communication problems.

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