

NEWSLETTER October 2008

TOPICS

| | |
|---|---|
| New WEB PAGE Dedicated to Ruminant Loggers | 1 |
| SENSOR BREAKAGE — Please Read!!! | 2 |
| CLEANING pH Probes | 2 |
| The Latest on ION SPECIFIC Sensors | 3 |
| ORP Measurements | 3 |
| NEW MODELS | 3 |
| The Small Ruminant (Bolus) Logger (SRL)..... | 4 |
| In the works..... | 4 |
| CONNECTOR Problems | 5 |
| NEW SOFTWARE Release.....V6.1x, and Manuals too!..... | 5 |
| pH Sensor DIAGNOSTICS | 6 |
| ORDERING Sensors | 7 |
| Stories from the Field—Broken Loggers..... | 8 |
| DASCOR Contact Information..... | 8 |

New WEB PAGE Dedicated to Ruminant Loggers

Please visit the new section of our web site dedicated to Rumen Loggers at

<http://www.dascor.com/pages/ruminframe.html>

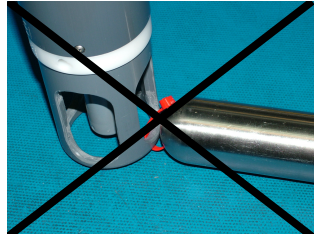
You will find updated information on our loggers, all of our newsletters, manuals, User's Guides, and software for downloading. Copies of relevant published papers are also available. Also check out the PROJECTS tab to see some of the other fun projects we get involved with.

Due to the increasing size of our newsletter, and the inability of some mail servers to accept the larger files, it is now available for download on our website. The newsletter will be used primarily to bring you up to date on our current technology and marketing efforts, and announce changes in performance, new software releases, and technical notes on relevant topics. We will notify you by email when newsletters are posted.

Contributions and requests for information are more than welcome. However, if you are not interested in receiving it, please let us know!

SENSOR BREAKAGE — Please Read!!!

Feedback on the Hemi-glass electrodes suggested that the breakage rate was significantly increased over the flat glass style—most likely because the glass bulb extended past the end of the sensor body. It was a worthwhile test, but we are no longer offering the model with the hemispherical glass electrode. However, a reminder is in order that the method for mounting the weights can help significantly with breakage due to impact. The photos below should make all things clear.



DO NOT ATTACH THE WEIGHTS THIS WAY!



DO ATTACH THE WEIGHTS THIS WAY!

CLEANING pH Probes

Why clean? At \$140 each, the sensors are a major contributor to test costs. Cleaning extends the usable life. The folks at Lethbridge clean the sensors after every test, and are seeing the sensors last 45-60 days in the rumen.

After each use, and definitely prior to storage, pH sensors should be cleaned. There are several ways to clean them, and several ways NOT to clean them. First the NOT: Do not use polar chemical solvents used for cleaning paintbrushes, such as acetone, paint thinner, etc. If the white porous junction gets soft and sticky, a solvent in your cleaning solution is to blame! However, dilute isopropyl alcohol is OK, as is soap and water, or dilute acids (HCl 5:1 dilution). Many labs have an enzyme based cleaner for lab ware that works very well, and is recommended by the sensor manufacturer: Tergazyme (or Terg-A-Zyme) by Alconox¹.

Be very, very careful not to get the connector wet.

¹.....Here's the link directly to the Alconox website...it includes links to world-wide distributors:

http://www.alconox.com/static/techbull/techbull_tergazyme.asp

And here's a link for a free sample: http://www.alconox.com/section_top/m-sample.asp

And another for instructions: http://www.alconox.com/section_top/gen_manual.asp

The manufacturer suggests the following procedure: clean the electrode with soap and water, GENTLY rubbing the glass with a SOFT cloth. Then rinse with tap water. Mix 0.5 gram of Terg-A-Zyme with 50 ml of water and soak the probe in the solution for 30 minutes, followed by a rinse in tap water. Cool or warm water is OK. Hot water is not necessary. Finally place the cap partially filled with storage solution² over the end of the sensor. A toothpick or syringe needle can be used to “burp” air out of the cap. The sensor may be stored in any position. New sensors are being shipped with a wet paper/cotton sponge in the cap rather than the easily spillable liquid storage solution. Either works well, although we have noticed that sensors stored with the damp sponge sometimes take a couple of hours to return to normal operation.

Once mixed with water, Terg-A-Zyme has a short working life, so mix up only what you need at one time and discard the used solution!

The Latest on ION SPECIFIC Sensors

Initial tests on a prototype NH₄⁺ sensor showed great promise on the bench. However, exposure in the rumen for 24 hours resulted in unacceptable drift between the beginning and ending calibrations. We are working with other alternate designs to see if this problem can be overcome. There also appears to be a significant cross-sensitivity between ammonium and potassium ions with the Ion-Specific sensors, and successful measurements may require both sensors. Stay Tuned.

If you are interested in supporting this project with funding, field testing, or other technical support, please contact kborsum@dascor.com. Sensors that can connect to the T5 series loggers for bench testing or use in artificial rumens are available for about \$400 each. Due to their cost, we cannot provide the test sensors without payment, and the manufacturer has a minimum quantity of 5 as well.

ORP Measurements

Jean-Philippe Marden of Lasaffre/Ensaf in France presented an excellent paper at the JAM on his work with ORP/REDOX. He also made a presentation in DASCOR's conference-hospitality room on ORP/Redox and dissolved oxygen measurements. His presentation should be available for download on our website by the time you read this.

He is also planning an ORP validation study using the LRCpH loggers with a paper at the Montreal conference.

NEW MODELS

At this point, DASCOR has shipped over 150 Rumen Loggers. The current version is the “T5” series, and is available with one or three replaceable sensor positions plus the standard temperature and ORP/REDOX. Two connector styles are also available. To maintain compatibility with older units, we can provide the BNC (bayonet) style connector, but recommend moving to the new TNC (screw-in) style which is more robust.

².....The storage solution liquid provided in the cap by Sensorex is standard pH-4 buffer solution, but has some additional KCl added. DASCOR can provide bottles of storage solution.

The Small Ruminant (Bolus) Logger (SRL)

The SRL has been used in a project with Joerg Aschenbach and Greg Penner in Leipzig over the past several months including a series of validation studies. The logger provides the same temperature and pH measurements as its larger cousins, but is designed to allow use in non-cannulated small ruminants such as sheep, calves, and goats. The logger is administered orally and passes through the esophagus into the rumen. Battery life appears to be more than adequate, and the pH sensors currently have a life of about two weeks. A limited number of the prototypes are available now, and regular production units should be available in early 2009.

The prototype SRL's weigh in at about 250 grams, are 0.8" in diameter, and 5-3/8" long. The body is machined type-316 surgical stainless steel. Production units are expected to be slightly smaller in both dimensions, and may include ORP.



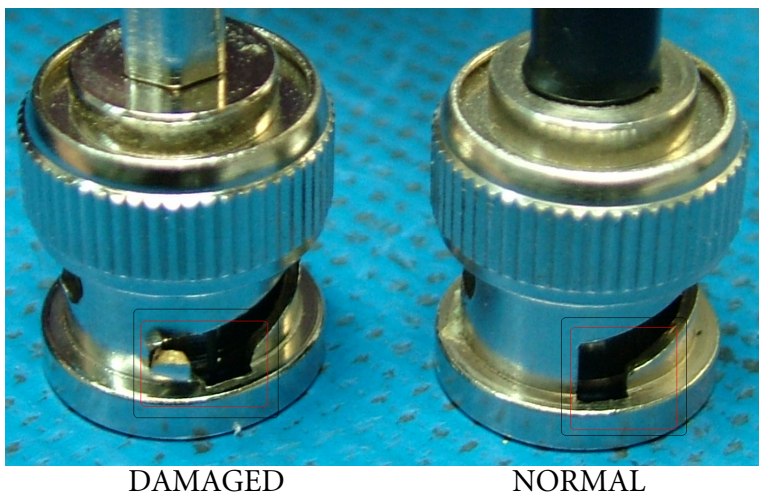
In the works...

- Miniaturized Temperature, pH and conductivity for intra-uterine logging
- Cannula mounted readouts for pH and temperature—perfect for students!
- Wireless interface adapters for “remote” operation
-

If any of these projects are of particular interest to you, please let us know.

CONNECTOR Problems

Examine the photos closely and you will see how over-zealous attempts to unscrew the bayonet style connector destroyed the connector body (on the left), while pulling it completely out of the logger. Excessive force should NEVER be required to install or remove the sensors. If you ever think force is required, please think again...The BNC style is a ¼ turn and pull to remove, while the TNC style screws in and out.



Also, please remember that the electrical signal associated with pH sensors is **highly** susceptible to contamination. If you get rumen fluid into the connector area, clean it immediately with DI water, then with a final rinse and dry using isopropyl alcohol, with plenty of time for any condensed water to evaporate afterwards. If the sensor still shows a reduced range following the cleaning, it will be necessary to return the unit to have the connector replaced.

If you blow out the connector area using compressed air or a canned “computer duster” the cold gas will cause condensation of water on the chilled metal parts...be sure to give plenty of time for the condensate to evaporate completely! A very light coating of Vaseline or plumbers grease on the sensor O-rings will ease the assembly of the sensor into the logger.

Contamination normally is indicated by a reduced range. The reading a pH=7 will remain roughly the same, but readings in pH=4 buffer will rise into the pH=5 or 6 range. This may also indicate end of life of the sensor, but occurs over a much longer period.

NEW SOFTWARE Release.....V6.1x, and Manuals too!

After a long wait, we have issued the latest release of the applications package for the LRCpH Loggers. All of the problems that have been brought to our attention over the last two years have been corrected, and support for new features has been added. From the User’s standpoint, the individual changes are small, but cumulative combine to make the package smoother to use, and less prone to locking up and exhibiting other inexplicable behavior.

The new version is available for download on our website. However, be sure to also download the [User’s Guide](#), and the [QuickStart Guide](#) and read them BEFORE installing

the software. Once a logger is used with the new software, permanent changes are made to the memory setup in the logger, and use with the older versions will cause data loss.

Many thanks to Bev Farr, Karen Beauchemin, and Greg Penner for their help with the *User's Guide*.

In the past, one of the major problem areas has been incompatibility between versions of the firmware (programs inside the logger), Data Formats (referred to as “header data”), and the software (that runs on the PC). These have been resolved in the new release. Appropriate warnings will be displayed upon first use of the new version with each logger. After all loggers have been automatically updated, old versions of the software should be uninstalled from all computers used with the loggers! Once a logger has been run with the new software, the header will be updated, and the warning notices should stop.

If you are using the USB to RS232 dongle, there is a new installation file and instructions.

READ THE INSTRUCTIONS FIRST!!!!

For our foreign users: We have many loggers in operation worldwide without problems. However, users in Germany consistently report problems with the date and time formats and with unexpected errors during download. In all reported cases, a unique German version of Windows is installed on the computers. We have no explanation for this, and no cure other than using a computer with a North American version of Windows XP or Win2K installed. If you are outside of North America, we'd like to hear from you, particularly if you are using a non-American version of windows. Laptops are dropping in price, and we would be happy to set up a unit specifically to work with your loggers, and include it with the purchase.

pH Sensor DIAGNOSTICS

So, you are having problems calibrating your pH sensors? The life is shorter than you think it should be? They just “don't work?” Read on!

1. Not so obvious, but often overlooked: is the sensor damaged?
 - Is the connector loose and wiggles when moved?
 - Is the glass broken? Use a loupe or strong magnifying glass to check for hairline cracks, particularly around the outer edge of the glass. Ragged broken edges facing the center imply impact breakage. Hairline cracks will cause a decrease in sensitivity depending on the size of the crack. A cracked sensor will eventually read almost the same in pH=4 and pH=7 buffer (typically 6.6-6.9 pH).
 - Is the white porous junction pulled out or pushed back?Yes to any of these suggest a mechanical problem. Roughly 2% of all pH sensors experience early failure due to manufacturing issues. Feel free to return any sensors to DASCOR for analysis that you feel may have failed for reasons other than normal use. If the manufacturer admits to a manufacturing problem, they will be replaced.

2. Is there rumen grunge³ on/in the connector?
See the previous notes on the connectors. Signs of contamination on the sensor or logger half of the connector pair is indicated by a drop in sensitivity. Be sure that the connector in the logger is clean BEFORE plugging in a new sensor! Grunge migrates.
3. Is there a major shift in the reading when the sensor is in buffer pH=7?
pH goes way up: The white reference porous junction may be clogged. Clean the sensor and try again.
pH goes all the way up or down: check for contamination and corrosion (green) on the connectors. In severe cases where the change appears to be uniform across several new sensors, there is probably a leak around the connector into the logger and there is internal corrosion of the wiring and printed circuit boards.
4. Is there a major shift in the reading when the sensor is in buffer pH=4 but little or no change in buffer pH=7 (Short span).
This indicates a shift in the sensitivity of the sensor. A slow upward shift at pH=4 over time indicates decreasing sensitivity and is normal. Most of the larger sensors should see a life of 40-60 days of actual use. Be obsessive about cleaning the sensor after every use for maximum life.
A sudden larger shift is most often the result of contamination of the connector, or a crack in the glass part of the sensor. Appearance of the shift with increasing temperature suggests a hairline crack that opens when the temperature rises.
5. If any of your sensors do not give the expected life, please feel free to return them to us for analysis. We can't promise a warranty exchange or pay for the shipping, but the analysis of returned sensors will allow us to identify problem areas and make changes that will improve their life and overall performance. Please: Clean, disinfect in bleach, and double bag in plastic baggies before shipping or mailing them back to us!

ORDERING Sensors

All sensors have a shelf life, and in order to give you the longest life possible, all sensors are manufactured to order. Lead times after receipt of your order will normally be about three weeks...but we have seen it go out as far as five weeks in recent months. Please keep this in mind when planning your experiments!

When you order your sensors directly from DASCOR, you will be getting sensors specifically matched to your LRCpH loggers for form, fit, and function. You will also benefit from our ongoing efforts to improve sensor performance and life in the rumen. Sensors purchased from other sources, including Sensorex, may have similar part numbers, but are not guaranteed to work with the LRCpH loggers, or have similar life expectancies in the rumen, and their use may void existing warranties on the loggers.

Also, when you order directly from DASCOR, you will get complimentary packets to make up calibration solutions, free air freight on orders for ten or more sensors, and our prices are the same or lower than you will find elsewhere. Regular purchasers will also occasionally find a new type of sensor to test or other useful item in the package. You will also be contributing to our effort to develop new lower cost sensors specifically for use with the LRCpH Loggers. It's a win-win situation!

³ "Grunge" is that icky stuff that accumulates in dark corners or other hard to get at places where it is usually most unwelcome. Rumen fluid usually qualifies as grunge when it is almost anywhere except in the rumen. ;-)

Stories from the Field—Broken Loggers

The symptoms were a very rapid battery drain, reducing the life of a new battery to hours, and a broken top cap.

As near as we can figure out (well, guess, actually) from limited information (those pesky student researchers just won't "fess up"), the problem logger was dropped on the cap end, most likely between being set up for a test and insertion in the rumen. A hairline crack was created around the projection on the top used to secure the lanyard, which in turn allowed small drops of rumen fluid to leak into the logger and settle around the battery compartment and connectors on the top plate. Eventually, the rumen fluid seeped past the barrier and corroded a number of contacts inside the case, which caused a short across the power circuits, draining the battery. When a screwdriver was inserted into the cross-hole on the cap to remove it, the projection broke off leaving a large hole in the top of the cap.

The second logger came back with the complaint that none of the (unused) sensors would work with it. When we received it, there was no visible damage, and the unit worked perfectly. There were, however, indications of possible past fluid contamination in the sensor connector area. Apparently the fluid had dried by the time the unit reached us and was no longer shorting the sensor. If you see a logger that does not want to work with any of your known good sensors, check the connector area for liquids or other contamination. Use DI water to rinse the area thoroughly and then give it a final rinse with rubbing alcohol, and allow it to dry thoroughly. If the problem persists, return the loggers to us to have the problem diagnosed completely, and a new connector installed.

PLEASE download and copy the User's Guides and Manuals from our web page. Be sure anyone using the loggers has a copy and is required to read it. The good folks at Lethbridge have spent a lot of effort into distilling their field experience into these documents for your benefit.

DASCOR Contact Information

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Panic: 1-619-794-7788 (Kelly's cell)
Website: www.DASCOR.com
Email: websales@DASCOR.com or kborsum@DASCOR.com

We have been getting an incredible amount of spam in recent months, and have had to tighten up our email filters at the risk of losing your emails. Please call if you don't get an expected response in a reasonable amount of time!