APPLICATION NOTE

CAS DATALOGGERS

# Manage Fish Tank Temperature And More With TandD's RTR-500B Series

Tokyo University of Marine Science and Technology needed to find a way to monitor temperature and power from lighting and heating in seawater tanks and cultivation water tanks at their research and marine education field lab site in Tateyama, Chiba. They needed to monitor not only while they were on-site, but also when they were away from the site on evenings, weekends, and holidays. As they were dealing with living organisms, they needed a system that would send warning notifications by e-mail when a temperature measurement exceeded a set upper or lower limit. They also needed to be alerted when abnormalities in the power to the heater and lighting devices occurred.

## Installation:

A system was set up using the TandD RTR-500B series of wireless data loggers. To monitor and record sea water and tank internal water temperature, the RTR-502B temperature loggers were used. The RTR-502B features a compact, durable, and IP64 splashproof design and comes with a two-foot-long waterproof temperature probe plus a six-foot extension cable. The probe length plus extension cable allows the loggers to be easily mounted near the tanks with the probe immersed in the water to get an accurate temperature. The RTR-500 family uses a proprietary 900 MHz radio to communicate between the measurement transmitters and the base station. They

provide a wireless range of up to 500 feet, significantly beyond the range of Wi-Fi or Bluetooth wireless communications. If necessary, wireless repeaters can be introduced to extend the wireless radio communication range between remote units and the base station.

To monitor for power supply abnormalities, RTR-505B-V voltage loggers connected to split-core AC current clamp sensors were used. The RTR-505B-V comes with a convenient connector "dongle" allowing it to easy to connect the wires coming from current sensors. The sensor itself needed no power supply and provided an output voltage in the range of 0-10VDC for an AC current of 0-25AAC.

## Utilization


Although the RTR-502B loggers themselves are IP64-rated and splashproof, they wrapped the sensor connection area in a plastic bag for additional protection. The remote units were placed in areas to offer a direct line of sight to the base unit to help ensure stable wireless radio communication. In places where either distance or intervening structures caused communication issues, they introduced RTR-500BC repeaters to extend the range. The individual loggers, repeaters, and base stations were configured using the RTR-500 for Windows software.

All of the data from various measurement points including real-time values and recorded data was automatically collected by the RTR-500BW base unit which in turn uploaded it to the TandD WebStorage Service cloud-based platform. Once there, real-time data could be monitored for any out-of-tolerance conditions and previously recorded data could be graphed, analyzed, and archived via a standard web browser on a PC or the WebStorage Viewer app on a mobile device. The warning notification limits and settings were configured for sending the warning e-mails upon rises or drops in temperature or if the

AC to the heater or light was outside of the expected range.

## Benefits:

By using the wireless LAN-compatible RTR-500BW it was possible to take advantage of the internet networking already on site to monitor and log water temperature with the RTR-502B as well as to monitor supply currents with the RTR-505B-V connected to the suitable sensor. The use of a wireless network with the Web Storage Service also made it possible to view recorded data from a number of measuring points on a computer that was not at the site. The warning notification built into the system allowed for e-mails to be immediately sent when a temperature measurement fell below or rose above the set limits or when there was an abnormality in the power supply to the lighting or heating equipment allowing them to take immediate action in case of a problem.

*** This application note has been adapted from an article written by TandD. TandD is the manufacturer of the RTR-500B Series of data loggers, an optimal temperature and power supply monitoring solution for tank temperature monitoring.**

For more information on RTR-500B Series, or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.