APPLICATION NOTE

CAS DATALOGGERS

Remote Gas Flow Monitoring in a BioDigester

Compact Data Logger Aids Wastewater Treatment Company

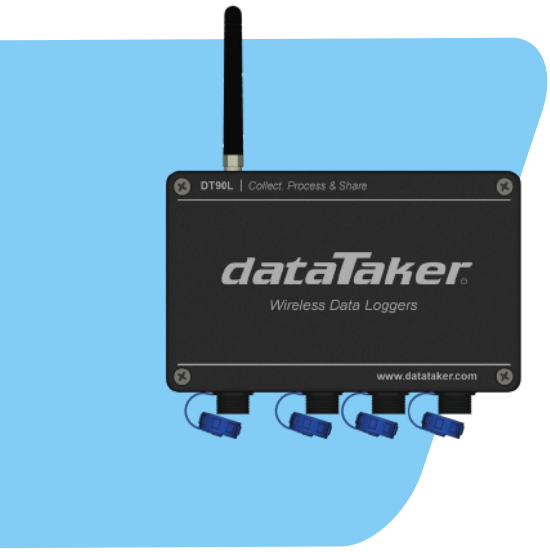
CAS supplied the remote gas flow monitoring data logging solution for a wastewater treatment company looking to optimize its operation. In the natural gas industry, it's a well-established technique to produce biogas by aerobic or anaerobic "digestion," starting from various biodegradable materials. The gas obtained this way consists of 60-70% methane, and can be used to fuel the digester's boiler and electric generator engines.

The plant's Utilities Director decided that the ideal way to increase yields was to monitor and record the biodigester's gas flow. For example, immediately after feeding the digester, there was usually a strong momentary increase in gas production, but there was also seasonal variations since cold temperatures inhibit production. Consequently, controlling the feed rate would improve the production process. The director also required the capability to send alarms by SMS messaging.

Installation

The installed monitoring system consists of an industrial data logger connected to two gas flow meter sensors. The key factors are the installation environment and the properties of the gas to be measured:

1. A compact, self-contained weatherproof logger was required due to the need to be able to deploy it outside. The loggers needed to have an internal battery for power since AC power was not readily available at the site. It also needed to have cellular communications capability since neither Ethernet or WiFi was available. For this project, the dataTaker DT90L was chosen because it offered an IP67 rated enclosure and operated over a temperature range of -40 to +70C. An internal 48W-h lithium battery allowed extended operation and it could be connected directly to a 12V solar panel to recharge the battery for continuous operation. An integrated cellular modem allowed data tranmission and alarm notification.



2. The gases were mainly composed of methane and carbon dioxide (CO2), but hydrogen sulfide (H2S) and wet vapor were also present. Since these can have corrosive effects, technicians had to use specific gas flow sensors: in this case, two BFM mass flow meters. The flow meters were connected to the DT90's 4-20 mA analog inputs. One monitored the digester ouput and another measured the methane used by the boiler. Each flow meter had two 4-20 mA ouputs: one for the gas flow and another for the temperature.

Standalone Operation and Alarm Transmission

This data logger, housed in a rugged 160 x 100 x 80 mm powder coated aluminum enclosure, has a powerful 32-bit CPU with 16 MB of non-volatile storage for up to 500,000 measurements that provides for extended autonomous data logging capability. Additionally, the device's electronic circuits are designed to reduce the power supply requirements to a minimum so that it can operate for up to 300 days using the internal battery pack. A small 2W solar panel connected to the data logger recharges the battery to provide continuous operation year round.

The logger has up to 8 analog inputs that can accept voltage or 4-20 mA current signals. Via the configuration software the measurements can easily be scaled to the correct engineering units along with high and/or low alarm limits. The measurement rate can be set from once a second to once a day. The logger also provides a switched 5/12V excitation source to power external sensors.

The alarm-generation capability the customer requires is performed by the DT90L's internal 4G modem. The data logger can be configured to send SMS alarm messages and FTP measured data. While users mainly rely on the logger's wireless connection transmit the measurement data, it's also possible to download data using USB is desired.

Data Access from Smartphone and Tablet

Users can remotely monitor the plant online via smartphone or tablet thanks to the Datataker Live Cloud Web Portal. This service allows users to drag and drop widgets to configure and build custom dashboards that display critical information via a PC, smartphone or tablet.

Benefits

The DT90L data logger has both the necessary durability and small footprint for this deployment. With eight channels and the internal 4G modem, it's a cost-effective device. The rugged, weatherproof construction plus the internal battery allow it to be deployed in a harsh, remote environment. Meanwhile, the Cloud service enables remote monitoring and mimic generation. These features help the director fine-tune his process and improve yields.

For more information on the dataTaker DT90L, 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.