



## TELEMETRY TODAY: Grills, Bills, Ills, and Fills

Telemetry is finding its way into more markets, providing value in everything from smart meters to Southern cooking.

The United States recently celebrated the 40th anniversary of man landing on the moon. Yet, the momentous event remains mired in controversy: conspiracy theory or fact? One way to solve the mystery is to view tapes containing telemetry data collected by the astronauts and the ground crew; tapes that have mysteriously vanished.

The highest-quality television signal from Apollo 11's touchdown zone in the moon's Sea of Tranquility—from an antenna mounted atop the Eagle lunar lander—was recorded on telemetry tapes at three tracking stations on Earth: Goldstone in California and Honeysuckle Creek and Parkes in Australia.

The tapes that have been the object of a massive search were not standard video recordings, but rather 1-in. instrumentation tape on which narrowband video shared space with mission telemetry and other information about the spacecraft and its crew. The 14-inch reels ran at 120-in. per second, with each holding about 15 minutes of data. Slow scan video from the camera onboard the lunar lander occupied one of 14 tracks laid down on these tapes.

Telemetry allows remote measurement and reporting of information. Although the term commonly refers to wireless data transfer mechanisms (e.g. using radio or infrared systems), it also encompasses data transferred over a telephone or computer network, optical link, or other wired communications. The original telemetry systems were termed supervisory because they were used to

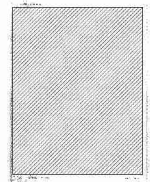
monitor electric power distribution. In the first such system, installed in Chicago in 1912, telephone lines were used for transmitting data on the operation of a number of electric power plants to a central office. Since then telemetry has spread to other fields, each making improvements and modifications to suit the desired purpose, and propelling this technology to grow substantially.

"We're expecting the market for telemetry connectivity services to grow from approximately \$2.9 billion globally in 2008 to roughly \$10.9 billion globally by 2014, driven in part by a desire for operational efficiency," says Sam Lucero, practice director, M2M Connectivity, ABI Research, [www.abiresearch.com](http://www.abiresearch.com), Oyster Bay, N.Y.

Today, telemetry is finding a place in a wide range of industries, including smart-grid applications, transportation, and healthcare.

### ENERGY BILLING AND BBQ

Trico Electric Cooperative, [www.trico.coop](http://www.trico.coop), Marana, Ariz., operates more than 40,000 meters and 3,100 miles of energized line in the Tucson, Arizona, area. The broad service territory required a meter technician to drive 200 miles through the span of two days, visiting each meter and downloading usage information. An



existing power-line carrier system was in use, but the required load profile data exceeded the available bandwidth. Additionally, a proprietary remote meter reader was used to collect residential use, but the data was not of sufficient quality to generate bills. The decision was made to seek out an alternate solution.

Trico deployed SmartSynch's, [www.smartsynch.com](http://www.smartsynch.com), Jackson, Miss., A3 SmartMeters, a grid solution powered by the Motorola G24 wireless module for two-way communication. GPRS (general packet radio service) networks transmit energy consumption and billing data back to the SmartSynch Transaction Management System (TMS) server, which interfaces with Trico's billing system.

"A major benefit of the solution has been outage notification efficiency," says Yossi Lovton, product portfolio manager, Motorola Wireless Modules, [www.motorola.com/m2m](http://www.motorola.com/m2m), Schaumburg, Ill. Via the GPRS technology, outage notifications are sent via email to all meter techs and dispatch and account executives seconds after the outage is detected. This enables Trico to dispatch a team to the location before the customer can even call to report the disruption.

Trico is also able to monitor the emails around-the-clock for faster response time and more efficient billing.

"The most important benefit of wireless monitoring or smart meters is that it allows the possibility to efficiently control our ecological system, in ways that eliminate energy waste and saves power, time, and costs. These are the immediate results of online analysis capabilities, copper line infrastructure savings, and less work hours," says Lovton.

As businesses and even residents look to energy-monitoring devices, they must bear in mind that there are no standards for in-home communication. For this reason, Advanced Telemetry, [www.advancedtelemetry.com](http://www.advancedtelemetry.com), San Diego, Calif., has developed EcoView to work with wired and wireless communication protocols. "This allows you to deploy components from various suppliers and, in many cases, have a do-it-yourself installation," says Gus Ezcurra, president, Advanced Telemetry. "EcoView empowers the commercial and residential customer to take charge of their energy consumption data, and save on energy bills."

EcoView Commercial incorporates thermostats that communicate with a touchpanel about electrical loads. The touchpanel also receives data from a metering device installed at the breaker panel. A secure Website is available to access the data available on the touchpanel. EcoView Residential includes the touchpanel and a resource meter that shows whole-house electricity consumption data.

The technology is being used at Jim 'N Nick's Bar-B-Q, a Southern-style restaurant operating in seven states, to lower energy consumption. "The Web-enabled system alerts us if we have climate or usage variances so we can respond efficiently," says Sam Burn, commissioner of culture, Jim 'N Nick's Bar-B-Q. "This allows us to provide a consistent temperature and climate for our guests."

The system replaces the use of standard thermostats, which were costly and wasteful to maintain.

According to Burn, the new system has helped reduce energy consumption by 16% a month at the barbecue restaurant, saving \$1,000 a month in energy costs.

The restaurant installed its first Advanced Telemetry system in Birmingham, Alabama. "After seeing the results we have begun a nationwide roll-out," says

Burn. He adds the cost was reasonable, particularly given the savings and other benefits that continue to accrue. There was a one-time installation and set-up charge based on the number of thermostats in the restaurants and a small monthly service charge based on the number of units.

The fact that the system is Web-enabled has made the training process simple, says Burn. "Instead of training the thousands of employees who could potentially impact our energy consumption through localized thermostat interaction, we have centralized control in the hands of a small group. This has allowed our management to focus on slow-smoked barbecue and genuine Southern hospitality—the things we know best."

## MONITORING TREATMENT AND TANKS

Focusing on what they do best was the objective of nurses at PPH (Providence Park Hospital), which has installed the Philips Intellivue Telemetry System, [www.medical.philips.com](http://www.medical.philips.com), Murraysville, Pa. The system



EcoView touchpanels communicate with thermostats about electrical loads, and information is also available via the Web.



supports wireless bedside monitoring, giving hospitals the benefit of a shared infrastructure that protects sensitive patient monitoring transmissions from enterprise network traffic. The IntelliVue Clinical Network can maintain a controlled connection with the hospital LAN (local-area network) so that lab results can be delivered to the bedside monitor or central station without disrupting the flow of physiologic data or alarms.

PPH, a member of the St. John Health System, [www.stjohn.org/providencepark](http://www.stjohn.org/providencepark), Novi, Mich., is using the technology to set itself apart from its competitors, enabling the hospital to monitor patients anywhere in the medical facility. All of the beds at PPH are telemetry capable, so that a second set of eyes, 24 hours a day, are always watching the patients who are placed on the monitoring devices, explains Sandy Tobar, director of critical care, PPH. "Nurses want to be at the bedside with their patients, not sitting at a desk watching the monitors."

Technicians monitor the telemetry device to filter nuisance alarms and ensure that patients receive the care they need should abnormal rhythms appear. "If an alarm goes off, and it is determined valid, the nurse's response time is immediate," says Tobar. "Our patient care model is to move the technology to the patient, not the patient to the technology. The flexibility of the telemetry system means fewer room transfers for patients and allows the patient and their family to build a better rapport with the nursing staff," says Tobar.

Providing remote access to information on tank inventory levels is how TankLink, [www.tanklink.com](http://www.tanklink.com), Schaumburg, Ill., (formerly known as SupplyNet Communications) builds rapport with its customers. TankLink's machine-to-machine tank monitoring solution helps address the inventory management needs of the bulk chemicals, solids, foods, liquids, and biofuels industries. "Our customers deliver bulk materials to the production industry," says Shawn Welsh, vice president of marketing and business development, TankLink. "Monitoring tank levels to know how much material has been delivered at each site makes the trip more profitable. The goal is to leave with a full tank and return empty."



Tank level monitoring systems, such as those from TankLink, ensure the correct amount of product is delivered.

LSI (Liquid Systems, Inc.), [www.liquidsystemsinc.com](http://www.liquidsystemsinc.com), Simpsonville, S.C., supplies and installs tanks to animal feed manufacturers. Todd Goldsmith, COO, LSI, says in this tight economy, his customers are looking for improved inventory control. "Installing TankLink onto our tanks was a natural fit for us. Now, our customers know how much ingredient they used to make their feed and when they need to reorder."

TankLink is Web-based, so customers can view real-time inventory levels collected by the system and placed on an online portal. LSI is in the process of using the system to monitor dry bin applications.

## MAKING TELEMETRY WORK

As companies take on technology, the pros warn that telemetry can pose some usage challenges. First is the issue of the cellular networks many telemetry systems use to flow information back and forth.

"The 3G evolution is taking place, thus telemetry vendors will need to answer this trend in the near future," says Motorola's Lovton. "We expect that UMTS (universal mobile telecommunications system) with low data throughput would be a suitable solution for this market, as the service cost is one-third that of traditional 2G GSM technology."

At the moment, however, 2G is the common cellular technology for telemetry connectivity, with Motorola citing figures that say 80% of all telemetry applications are connected by some type of 2G network.

In addition to the cost and connectivity associated with cellular, there is application development complexity. "Telemetry applications tend to be complex to develop and deploy," says Lucero. "Typically you have thousands, hundreds of thousands, or perhaps even millions of remotely-deployed devices to be provisioned and managed and tied into complex back-end systems and applications."

Finally, Lovton says telemetry deployments are expected to last 10-15 years, especially for the smart grid. Thus, looking forward to scalability must be a consideration.

When all of this capability is realized, could telemetry's next stop be Mars? ■

*Cindy Dubin is a contributing writer for M2M magazine.*