

Thuraya M2M terminal keeps water resources data flowing in real time from remote installations

Case Study:

Thuraya M2M I-Real

Products:

Thuraya M2M - FT2225

Thanks to Thuraya and software company I-Real of the Netherlands, satellite technology will soon be helping people to live and work in some of the driest places on the planet by conserving and managing water.



A proven track record

I-Real is helping water authorities around the world conserve and manage water supplies.

Engineering company Royal Haskoning used its H2gO solution in Ghana when the city of Kumasi needed a new system to measure water usage as part of its plan to cut down on waste and increase its revenues.

RH engineer Michel Kievits says: "The I-Real flow-measurement technology and H2gO software did exactly what we wanted. We configured the system to transmit data every five seconds, which creates a real-time picture of water usage."

The Kumasi installation transmits data over the local cellular network, but Michel is confident it would work equally well via the Thuraya M2M network.

"It is a very flexible solution," says Michel. "I have used it elsewhere with satellite and even radio, and always with excellent results."

Introduction

A satellite orbiting 22,236 miles above the surface of the Earth would seem to have little in common with one of humankind's most precious natural resources – water.

Thanks to a collaboration between Thuraya and software company I-Real of the Netherlands, however, satellite technology will soon be helping people to live and work in some of the driest places on the planet by conserving and managing water.

The new solution hinges on the FT2225 M2M (machine to machine) satellite terminal from Thuraya. This device, no larger than a paperback book, will enable a satellite link between I-Real's water sensors and hardware at any unmanned location, and its H2gO water management software platform in the Netherlands.

Simon van den Dries, head of international business at I-Real, explains: "We designed H2gO to be accessible everywhere via the internet. It is a proven solution with major terrestrial communications systems such as GPRS and 3G, but these are often unavailable in remote locations. We teamed up with Thuraya to solve this problem by using their M2M network and the FT2225 terminal."



The problem

In theory, there is plenty of fresh water on the Earth for its population of more than 7 billion people. In reality, supplies are scarce in many places, and water is often wasted due to leaks, uncontrolled use by consumers and inefficient management by water authorities.

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Farmers in rural areas frequently take as much ground water as they want without restrictions – often more than they really need for effective irrigation – so a lot of water is wasted.

How can this problem, and thousands like it around the world, be solved?

Thuraya and I-Real got together to solve the problem of the “missing communications link.”

As an example, a study conducted by the Environment Agency of Abu Dhabi showed that ground water reservoirs in the United Arab Emirates are likely to run out within 50 years unless measures are taken to prevent waste and create new reserves.

Farmers in rural areas of the UAE frequently take as much ground water as they want without restrictions – often more than they really need for effective irrigation – so a lot of water is wasted. As in many countries, faulty infrastructure also allows water to leak away.

How can this problem, and thousands like it around the world, be solved? Effective conservation and management of water are essential. Unless water authorities know how much is being used, when and by whom, they cannot target their efforts to reduce waste. Without this information they cannot plan more efficient infrastructure and management systems.

Measurement already takes place but is often based on manual inspection. This involves workers driving to each site, measuring the water levels and flows, and bringing the data back to base, where it can be inputted into a computer system. This process is time consuming, prone to human error, costly and inefficient – and it means records are already out of date when they are created.

For optimum efficiency, water monitoring and measurement systems need to be fully automated and to generate data in real time. This allows water authorities to taken action quickly if they find a leak or another problem, such as water pressure that is too high. But to generate real-time data you need an always-on communications link, which may be weak or unavailable in the desert or in other remote locations.

The solution

Thuraya and I-Real got together to solve the problem of the “missing communications link”. At a test installation in the UAE, they installed an



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"It worked very well. The data came through to the H2gO platform over the satellite link rapidly and consistently in real time," says Simon van den Dries. "We experienced the kind of reliability and low latency we are used to when we deploy terrestrial communications with this kind of installation. We now plan to test it in a remote desert area outside Abu Dhabi."



A world of connected devices and applications

Thuraya's work with I-Real is just one aspect of its leadership in the development of satellite-connected devices. The same technology that carries real-time data on water resources is already used extensively for machine-to-machine (M2M) applications in sectors as diverse as banking, border control and oil and gas. And, as the growth of the Internet of Things (IoT) gathers pace, it will provide the essential satellite overlay required to ensure seamless, uninterrupted connectivity in all locations.

I-Real datalogger and sensors to measure the flow of water from a private well, and connected the sensors to an FT2225 terminal. The Thuraya M2M network, the FT2225 and the I-Real hardware and system have all been designed as "open technology", so set up and configuration of the equipment is easy. The solution works as an end-to-end virtual private network (VPN), which means it is highly secure.

The installation was fully self-contained, drawing power from a solar panel and backup battery. It sent updates every few seconds from the sensors to the H2gO water management platform in the Netherlands, enabling I-Real to create a real-time picture of water levels and usage at the site.

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deploy terrestrial communications with this kind of installation. We now plan to test it in a remote desert area outside Abu Dhabi."

The rugged, reliable Thuraya FT2225 is ideal for M2M deployments where guaranteed connectivity is essential for the control and monitoring of remote assets. The terminal is compatible with any IP-based network, while its "interface agnostic" design makes it simple to integrate with third-party hardware and applications. It and the Thuraya M2M network support highly secure two-way send and receive connectivity, while low latency enables instant message transfer and real-time monitoring with no delays. Onboard memory enables the loading of local applications on to the terminal for added control and flexibility.

Combined with the I-Real dataloggers and sensors, the FT2225 can enable a whole range of water-related remote installations, from monitoring of surface water and ground water level through to

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The Thuraya M2M, FT2225 terminal and I-Real will play their part in helping humankind make better use of its most valuable liquid asset.

research or preservation projects. In places where excess water is a problem, it could provide early warning of flooding, allowing the authorities to take emergency action in good time. And of course the FT2225 has many potential applications in many other sectors, such as mining, banking and oil and gas.

Realizing the vision

For I-Real, the pilot project in UAE was just the first step towards realizing a large-scale vision for water conservation and management in the region. This would involve using the Thuraya/I-Real solution to create a continuously updated "water atlas", showing where the UAE has water supplies, how much they contain, who is using them and how much they are taking out.

The atlas would give the country's water authorities the real-time information they need to draw up a strategic plan for restocking aquifers (naturally occurring underground water sources); upgrading water infrastructure (such as pumping

stations and long-distance pipes); and creating a reliable system for metering water usage and charging customers. "The vision is of ground water as a resource that is understood and managed, and the supply of water as a metered, chargeable service," says Simon.

Conclusion

The Thuraya/I-Real solution has been designed to meet growing global demand for intelligent water-management systems in remote areas where terrestrial communications are weak or unavailable. By monitoring and controlling water resources and infrastructure in real time - and raising the alarm when problems occur - it will help water authorities to build better, more efficient systems and to prevent disasters and failures, or limit their impact.

From the arid vacuum of space, the Thuraya satellite, the FT2225 terminal and I-Real will play their part in helping humankind make better use of its most valuable liquid asset.



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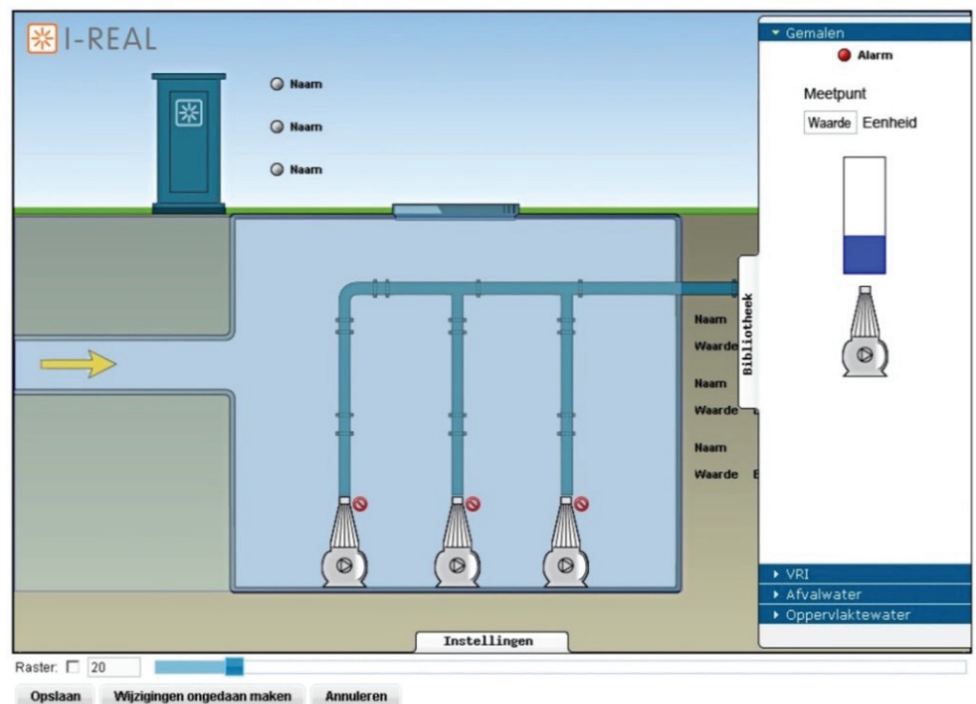
Thuraya M2M - FT2225

Thuraya FT2225 Features

- IP-based networking
- Low-latency for instant message transfer and real-time monitoring with no delays
- AES 256 encryption
- Two-way send/receive connectivity
- Low total cost of ownership with bandwidth-efficient networking and no minimum billing increment or overhead charges
- Multicast and broadcast capability enabling efficient mass polling and message distribution
- Embedded GPS and GLONASS
- Ruggedized highly reliable terminals for operation in harsh weather conditions
- Interface agnostic with Ethernet and Wi-Fi, support for other interfaces such as USB, serial, Modbus, CAN Bus is also possible
- Manufactured by ViaSat

I-Real H2gO Features

- Fully integrated protocols for all major PLC, datalogger and sensor providers such as Mitsubishi, Schneider Electric, Omron, T-box and Phoenix, with supported protocols such as TMX, IEC, Comli, Aquacom, Modbus, DNP3 etc.
- In addition to satellite it can support other forms of communications, including: GPRS, SMS, 3G, ADSL, Fiber, LoRa
- Pre-integrated objects such as: pumping stations, Weir, locks, measure points, pressure sewer, sedimentation tanks, booster stations, precipitation measuring, fountains
- Modular, scalable and open
- Secured against unwarranted use at every level according to NCSC standard



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About Thuraya

Thuraya is a leading mobile satellite communications company that empowers people with tools to bring the organizations and communities they serve closer together. We offer innovative, flexible and dependable technology that helps you overcome the toughest challenges and achieve the highest aspirations – facilitating reliable communications where and when it matters most.

Our global customers include industry leaders from a variety of sectors including energy, media, marine, government and NGOs. Our superior network enables clear communications and uninterrupted coverage across two thirds of the world via satellite and across the globe through our unique GSM roaming capabilities.

www.thuraya.com

About I-Real

I-Real is a leader in Water IoT services and provides remote monitoring and control solutions to the Dutch Water industry. It has also connected other public related infrastructure for its Dutch customers in the field of Energy and Traffic.

I-Real is internationally deploying H2gO software (branded or white label) and provides a range of sensors and data loggers. For communication I-Real uses a variety of cellular (2G/3G), satellite and LPWAN technologies such as LoRa.

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