MetTel

mettel.net

Sensor-as-a-Service

Empowering Water Departments with IoT

Overview

Utilities on the Edge of Transformation

As utilities are transforming to more connected and distributed grid systems, their mobile workforces are transforming as well. In the past, workers need to work 40 hrs. a week searching for reported and unreported problems. They also had the added burden of responding to every service call. Today, utility companies in the US are beginning to look for new ways of completing this work, and new ways of saving money. Water companies are now at a crossroad. It is a time of digital transformation where tools and technologies designed to connect infrastructure – including water mains and valves – can help provide invaluable information to run systems better, more efficiently and effectively.

City and state water departments now have a significant opportunity to leverage real-time data from their better-connected systems with key operational data and information for reporting, remote equipment operation, automated dispatched for service and cost-effective remote monitoring. Most departments now see the absolute need for smart systems that look for costly leaks and can turn on/off water mains remotely and even automatically. These and more automations can be achieved by simply deploying MetTel's Sensor-as-a-Service Platform that can result in up to a 40% cost savings for water departments.

The Problems for Water Departments – Ongoing Underground Issues

According to the American Society of Civil Engineers, "Our nation's drinking water and wastewater infrastructure is aging and overburdened, and that [infrastructure] investment is not keeping up with the need. However, a modest increase in investment in drinking water, wastewater, and wet weather water quality measures can prevent future economic losses."[1]

Everyone agrees that one of the major contributors plaguing water departments is pipe failure but there is no consensus on the most significant factors that contribute to these pipe failures. Recent evidence shows that pressure extremes and variability caused by system operation and fluctuations (in end-user's demand) are major contributing factors in many pipe failures in addition to background leakage. Not surprisingly, pressure control in water distribution systems remains a significant, ongoing concern for water utilities.

1 https://www.asce.org/water_and_wastewater_report/

Despite the general agreement that pressure variability should largely be minimized, the investigation of the impact of unsteady hydraulics on pipe failures has been inhibited by technological and technical constraints. Limited greatly by the cost barriers of existing monitoring solutions (which are usually outdated, expensive and volatile), water departments are struggling to increase visibility on their systems operating. This is where MetTel's IoT pressure sensors come in.

MetTel's Sensor-as-a Service – A Platform & IoT tool for your Water Department

The simplest and most effective way to automate your water system is MetTel's Sensor-as-a-Service platform, which easily adapts to the array of use cases emerging with water distribution throughout city and state governments. MetTel now offers a new application for our state-of-the-art IoT tool. This new service is our Sensors-as-a Service platform created exclusively for water departments. Our SaaS platform is a dashboard that connects a set of tools including smart sensors, circuit boards, cabling, and live tap pressure sensors. By connecting these tools and deploying this system, the daily grind of water techs can be greatly reduced as most work can be done remotely, reducing operational costs by about 40% (directly resulting in ROI). This game changer is a mobile IoT tool set that creates low-power/low-cost advantages for your water systems. By implementing MetTel's Sensor-as-a-Service, you'll have a complete set of water pressure sensors that provide real time data throughout your water system including accurate up-to-the-minute pressure readings. Additionally, when you deploy our system, our IoT sensors will capture and report anomalies as they happen as part of your inherent system design. Not only does our water pressure monitoring platform provide more accurate data on your systems, it does it for a fraction of the cost of many existing solutions, which typically only store data based on intervals several hours old.

As part of MetTel Fleet Services for Utilities, our Sensor-as-a-Service platform can quickly provide a solution to meet the needs of any water department by providing this managed service to be used by techs (for installations and field services) as well as an API to be used by IT workers to integrate into existing internal systems. When your city or state water departments uses our service, you'll have a smart water pressure monitoring system that can connect to other Smart City services.

How It all Works: Sensor-as-a-Service Hardware & Software

Connected Circuit Boards

MetTel's MIoT PCB (printed circuit board) connects to a small circuit board that integrate the 4 to 20mA pressure loop sensor data. These boards are securely mounted within an IP67 rated enclosure that also houses and additional 12V 7.55 Ah non-rechargeable battery pack. Our hardware includes an externally mounted enhanced antenna as well as connectors for a cable harness. The cable harness provides enough length to reach from the enclosure (typically mounted near the top of the vault) to the sensor installed in the water main.

IoT Sensors

In consultation with your municipal operations staff, we offer several options including a 150 psig pressure transducer with a snubber. This 4 to 20mA loop sensor gets tapped into live water main using a stainless-steel tapping sleeve. Note: The live tap installation of the sensor must be done by certified Safe Drinking Water Operators.

Auto-Reporting Configuration

MetTel's water pressure monitoring solutions have been designed for a standard reporting frequency of every 15 minutes when installed. Additionally, the devices can be configured to instantly report when fluctuations exceed or fall below user-defined pressure thresholds. When this occurs, the device is programmed to increase reporting frequency and generate user alerts. The device will return to standard reporting frequency when the pressure resolves to the acceptable range.

Battery Packs

Our 2V 7.55 Ah non-rechargeable battery packs are designed to last on average three years (based on 15-minute reporting intervals). The system measures the battery voltage and alerts can be set to alert for pending replacement. And, the replaceable battery packs are easily swapped out when needed.

Dashboard

The intelligence in our IoT devices allow them to recognize events based on environmental conditions. On-board sensors gather mission critical information that is analyzed and reported back to a monitor through the easy-to-understand MetTel dashboard software interface. The application also supports alarms and warning notification management that can alert monitors in real-time. The cloud-based dashboards also offer a view of the raw data that can be integrated into customers' back office systems using our robust API and developer tools.

All Working Together

The below image shows a water pressure monitoring kit with both a clear enclosure demonstration unit and a production unit with cabling and attached sensor. Also shown is a live tapping sensor with stainless steel tapping sleeve.

Our SaaS Platform in Action

In cooperation with a major municipal city water department staff, in 2019, MetTel deployed our low power cellular solution for monitoring water pressure in its underground fresh water mains. This customized design was built to achieve the following:

1. Real-time 15-minute standard updates
2. Increased reporting (and alerts) based on upper and lower pressure threshold being crossed
3. Achieve minimum of three years battery life with easily replaceable battery packs
4. Will work in underground vaults in harsh and extreme conditions
5. Provide accurate water pressure measurements

After quickly integrating with the chosen sensor, MetTel prototyped, tested and proved the solution within weeks. As a result, this municipality is experiencing immediate ROI, has lessened response time to fix broken water mains, and now has a full view of its complete system's water pressure in real time.

Making your City or State Instantly Smarter, Instantly Connected

By using MetTel's Sensor-as-a-Service platform, your city or state water department can continuously monitor water pressure, and therefore have a better understanding of what is happening inside your pipes in real time. Problems that were unavoidable in the recent past can now be dealt with before minor leaks become major breaks.

Here is a list of typical results and impact after deploying MetTel's Sensor-as-a-Service platform and tools.

Added Control & Increased Performance

City and state water departments will have increased control of their system by having all current pressure conditions at their fingertips. And because water main valves can be shut off or turned on remotely, services calls can be scheduled with minimum damage occurring while waiting for the tech to arrive. All service dispatches can be automated, which will lessen response time greatly.

Overall System Upgrade

By deploying our Sensor-as-a-Service platform, your existing infrastructure will be immediately upgraded to an IoT based state-of-the-art pressure monitoring system at a low cost that can be integrated with existing systems.

Increased Availability & ROI

With real-time monitoring and reporting for your water systems, you'll have greatly improved performance and decreased response time when incidences occur, lessening repair extent and associated costs. And, because of MetTel's platform, your water system will be more reliable than ever as pressure anomalies will be reported instantly. By reducing required daily tech maintenance requirements, ROI can be recognized starting at deployment.

Learn More

Contact your MetTel IoT Services representative at **(877) 963-8663** to schedule a meeting on this and MetTel's other IoT tools specifically designed for your water department.

About MetTel

MetTel is a leading global provider of integrated digital communications solutions for enterprise customers. By converging all communications over a proprietary network, MetTel enables enterprise companies to easily deploy and manage technology-driven voice, data, wireless and cloud solutions worldwide. MetTel's comprehensive portfolio of customer solutions boosts enterprise productivity, reduces costs and simplifies operations.

© 2019 MetTel. All rights reserved.