



KETOS Wave™

SOLUTION OVERVIEW

ACTIONABLE REAL-TIME WATER EFFICIENCY DATA - ALL FROM A SINGLE SYSTEM

Understanding water utilization in real-time, detecting anomalies in flow and pressure, and sensing leaks at a single location or across a distributed network can be imperative for proactive operations in a city or a business. The United States alone loses 14% of treated water annually which results in 1 trillion gallons of water loss.

Several products today on the market offer partial solutions, but there is a clear need for a vertically integrated solution that not only delivers a holistic understanding of water use management but can also give insights to operators for actionable intelligence.

The innovative KETOS Wave solution is an intersection of IIoT (a smart connected real-time network) with hardware sensing & automation combined with data science for water management.

The KETOS WAVE Solution delivers real-time, actionable water metrics necessary to increase resource efficiency, improve operating decisions, and improve overall grid management beyond commercially available AMI / AMR for utility managers. In addition, operators can maintain the highest level of customer satisfaction through boosting water conservation, proactive broadcasted alerts, email announcements via the mobile app, and predictive maintenance.

The KETOS WAVE solution has significant intellectual property (IP) in both its sensor hardware and cloud-based enterprise software. Proprietary, self-powered hardware with remote shut off capabilities, all integrated as a single device provides real-time monitoring of water metrics such as flow, pressure, leaks, usage, and volume all from a cloud-based analytics platform.



PRODUCT SPECIFICATIONS

- AWWA approved specifications
- Power: Self-power and Plug-in power options available
- Dimensions: 5.63"L x 3.5"W x 3.13"H
- Certifications: NSF 61 and NSF 372
- Testing: Waterproof (IP68), break proof, made with weather resistant durable materials
- Weight: 1.87 lbs.
- Resilience: Tested for earthquake resistance and heavy rains in outdoor use
- Flow Rate (3/4 inch): Optimized for low flows; 0.5 L/min up to 80 L/min
- Connectivity: Cellular (4G) for backhaul from gateway / RF (LoRa) Network available based on scale and design of deployment from the KETOS Wave hardware.
- Flow Sensing Mechanism: Patented technique
- Pressure Sensing: 75 PSI (120 PSI coming summer 2020)
- Adapter: Male 3/4", 1" NPT (2" coming summer 2020)

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ADVANCED METERING ANALYTICS

The solution offers advanced metering analytics capable of providing usage based billing and interactive water use management all from a cloud-based platform. The KETOS Smart water management platform is a flexible solution that can integrate via APIs with existing supervisory, CMMS, billing and other legacy platforms that are currently in use within a utility.

TRIPLE SELF-POWERED

KETOS Wave is easily installed in-line through a standard connection (up to 2"). KETOS Wave hardware collects, transmits and analyzes data in either real-time or at a user specified interval. The KETOS Wave hardware is primarily self-powered by generating energy through the flow of water with a custom turbine used for both flow measurement and power generation. An internal battery is also included as a secondary source for smart energy harvesting during intermittent flow situations. As a tertiary power source, integration with solar panels is an available option for remote applications.

RELIABLE METER READS

Typical smart water meters rely on noisy cellular carrier services to transmit information which can be unreliable and result in a low percentage of read confidence especially when the hardware nodes are deployed 3ft-6ft underground on the outside of residential homes. Typical smart meters can also be expensive for a pay-as-you go model, impact architecture at scale and affect the number of features offered in the hardware device as frequent cellular transmission is energy intensive.

KETOS Wave was developed from the ground up as an IoT (Internet of Things) solution first with reliable communications in mind, capable of transmitting in real-time while being feature-rich with flow data, pressure data, leak detection data as well as offering remote shut-off capability, all of which are features with intense power requirements. The KETOS Wave sensor hardware nodes communicate directly to a gateway using LoRa (Long range, low power) which allows for frequent, accurate data communications that can scale for today's complex environments. KETOS Wave employs a custom software stack for bidirectional communications allowing users to benefit from an interactive response with the operations of the hardware.

TWO-WAY COMMUNICATIONS

Two-way communications come as a standard feature with the KETOS Wave solution. This allows for 24x7 remote monitoring and maintenance functions allowing for features like remote shut-off as well as diagnostic reporting, proactively driving significant savings.

ZERO CAPEX SUBSCRIPTION SERVICE

The KETOS WAVE solution is offered as a complete end-to-end service for a flat fee. This reduces the complexity of having multiple vendors and integrators for hardware, communications, software, and maintenance. This also gives utilities the opportunity to not allocate capital expense budgets from taxpayer dollars.

The complete service package helps operators to scale as needed without infrastructure overhead and it includes the following for the complete term of the contract:

- Lease for all hardware (Intelligent Wave Nodes)
- Warranty for all hardware components
- Maintenance and replacement parts as needed
- Cost of connectivity for all the installed nodes
- Cost of the KETOS Wave Gateway as part of the LoRa communication framework
- Cloud hosting and storage management
- Role based access for secure data control
- Cloud based analytics available on a web browser or a mobile app
- Real time data visualization with predictive intelligence
- Software and firmware upgrades for the devices, connectivity nodes, and the platform
- Unlimited users for the platform
- Secure and role-based access of the platform
- Remote shut-off service capabilities from a mobile app or a web browser



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