Solution Overview Document

Introduction

This document provides an in-depth overview of various monitoring and metering systems, including JoJo Tank Sensors, Electricity Meters, Water Meters, Diesel Monitoring, and Gas Meters. Each of these systems is designed with specific capabilities to offer monitoring, accurate reporting, and efficient resource management. By leveraging these technologies, businesses can optimise their utility consumption, enhance operational efficiency, and ensure accurate billing and cost allocation.

The integration of these systems into a unified platform enables seamless data collection, analysis, and visualization, empowering users with insights for informed decision-making. This document explores the features, functionalities, and interdependencies of these monitoring solutions to provide a comprehensive understanding of their role in resource management.

1. JoJo Tank Sensor

The JoJo Tank Sensor is a water level monitoring system designed to ensure efficient water storage and consumption management. By utilising ultrasonic sensing technology, it provides timely insights into tank levels, helping users prevent shortages, optimise water use, and reduce wastage.

Key Features:

- **Level Status Monitoring:** Uses ultrasonic sensors to track water levels at set intervals.
- **Threshold Alerts:** Customisable triggers (e.g., low water level at 10%) sent via email or SMS.
- **Consumption Analysis:** Tracks historical data to identify patterns and trends in water usage.
- **Integration Capabilities:** Compatible with IoT platforms for centralised monitoring and automation.

2. Electricity Meter

Electricity meters play a crucial role in tracking power usage and optimising energy consumption. These meters provide real-time insights into electricity usage patterns, allowing users to adjust consumption habits and manage costs effectively.

Key Features:

- **Time-of-Use (ToU) Analysis:** Enables users to shift energy consumption to off-peak hours, reducing costs (e.g., R0.50/kWh off-peak vs. R2.50/kWh peak).
- **Billing & Cost Allocation:** Automates cost distribution across tenants or departments with detailed PDF reports and generates an Electricity bill.
- **Real-Time Monitoring:** Tracks electricity usage per circuit or device, identifying inefficiencies.

- **Dashboard & Visualization:** Provides Grafana-based visual analytics with anomaly detection algorithms.
- **Load Management:** Helps prevent overloading by monitoring consumption limits.

3. Water Meter

Water meters facilitate accurate tracking of water consumption to promote efficient usage and conservation. These meters can be integrated with sewage monitoring systems for comprehensive water management.

Key Features:

- **Water Consumption Monitoring:** Provides timely tracking of water usage.
- **Threshold Alerts:** Notifies users when consumption exceeds predefined limits.
- **Optional Sewage Monitoring:** Tracks wastewater levels and ensures compliance with regulations.
- **Tank Level Percentage Monitoring:** Works alongside JoJo Tank Sensors to provide comprehensive water management.
- **Automated Reporting & Notifications:** Sends detailed reports on water usage trends.
- **Billing & Cost Allocation:** Supports cost-sharing among tenants or departments and generates water bills.

4. Diesel Monitoring System

Industries that rely on diesel-powered generators require efficient fuel management to reduce wastage and ensure optimal performance. The diesel monitoring system provides detailed insights into fuel levels, usage patterns, and engine run hours.

Key Features:

- **Fuel Status & Ignition Monitoring:** Tracks real-time fuel levels and engine ignition status.
- **Level Status & Engine Hours Tracking:** Monitors diesel consumption and machinery runtime.
- **Leak Detection:** Identifies anomalies indicating fuel theft or leaks.
- **Automated Reporting & Notifications:** Generates consumption reports for better tracking and cost management.
- **Remote Monitoring:** Accessible via web and mobile applications.

5. Gas Meter

Gas meters enable efficient tracking of LPG consumption, ensuring optimal usage and proper cost management. These meters play a vital role in energy monitoring for commercial kitchens.

Key Features:

- **LPG Gas Consumption Monitoring:** Provides timely insights into usage.
- **Reporting & Notifications:** Sends automated alerts and consumption reports.
- **Platform Integration:** Works with existing utility management platforms for seamless tracking.
- **Billing & Cost Allocation:** Ensures fair distribution of gas usage costs.

- **Leakage Alerts:** Detects unusual gas consumption that may indicate leaks.

Workflow & Interdependencies

Each metering and monitoring system plays a distinct role, but together, they provide a holistic view of resource management. Below is how these systems interconnect:

1. Water Meter & JoJo Tank Sensor

- **Water Meter:** Measures total consumption across a facility.
- **JoJo Tank Sensor:** Ensures adequate storage and prevents shortages or overflows.
- **Synergy:** The combination of both ensures efficient water distribution and conservation, reducing wastage.

2. Electricity Meter & Diesel Monitoring

- **Electricity Meter:** Tracks grid power usage and helps identify consumption patterns.
- **Diesel Monitoring System:** Ensures backup generators are fuelled and operating efficiently.
- **Synergy:** By analysing electricity and diesel consumption together, businesses can optimise energy usage by balancing grid power and backup generators, reducing operational costs.

3. Gas Meter

- **Gas Meter:** Monitors LPG consumption and provides usage analytics.
- **Supplier Bill Management:** Ensures accurate cost allocation and financial tracking.
- **Synergy:** This integration prevents billing discrepancies and helps optimise gas usage based on demand trends.

4. Reporting & Platform Integration

- All monitoring systems feed into a unified data analytics platform.
- Provides centralised reporting, visualisation, and alerting.
- Enables informed decision-making through trend analysis and anomaly detection.

5. Overlap & Individual Importance

While these systems share reporting and integration capabilities, each is essential due to the unique nature of utility consumption. Their combined use offers a comprehensive approach to resource management, maximising efficiency while ensuring sustainability.

Conclusion

By integrating these technologies, businesses can:

- Enhance operational efficiency.
- Reduce utility costs through smart consumption.
- Improve financial management with automated billing.
- Ensure sustainability by minimising resource wastage.

With a unified reporting platform, users can leverage data-driven insights to make strategic decisions, ultimately leading to improved efficiency and cost savings across water, electricity, diesel, and gas utilities.

Feature Breakdown & Comparison

Feature	JoJo Tank Sensor	Water Meter	Electricity Meter	Diesel Monitoring System	Gas Meter
Primary Function	Monitors water levels in storage tanks	Measures overall water consumption	Tracks electricity usage	Monitors diesel fuel levels & usage	Tracks LPG gas consumption
Technology Used	Ultrasonic sensing technology	Flow-based metering	Smart metering with ToU analysis	Fuel level sensors & engine tracking	Gas flow metering
Monitoring Capability	Tracks water levels based on set intervals	Tracks water consumption over time	Monitors real-time electricity usage	Tracks fuel levels and engine runtime	Tracks gas usage based on set intervals
Threshold Alerts	Alerts for low/high water levels	Alerts for excessive usage or leaks	Alerts for peak usage times & overloads	Alerts for fuel theft, leaks, or anomalies	Alerts for abnormal gas consumption or leaks
Consumption Analysis	Identifies trends in water storage & usage	Analyses consumption trends	Identifies inefficiencies in power usage	Tracks fuel consumption patterns	Analyses gas usage trends
Integration	IoT-enabled for central monitoring	Integrates with billing & monitoring platforms	Works with smart grids & billing platforms	Can integrate with asset management	Compatible with utility management platforms
Cost Management	Helps prevent unnecessary refilling	Enables cost allocation for different users	Automates cost distribution & billing	Helps manage diesel expenses efficiently	Ensures fair billing distribution

Resource Conservation	Prevents shortages & overflows	Encourages efficient water usage	Helps shift usage to off-peak hours	Reduces fuel wastage & theft	Ensures optimal LPG usage
Billing & Reporting	Not applicable	Generates detailed water bills & reports	Generates electricity bills & detailed reports	Provides fuel usage & run time reports	Generates gas consumption reports & billing

Synergy & Interdependencies

While each system serves a unique purpose, their combined use creates a comprehensive resource management system. Here's how they complement each other:

- **JoJo Tank Sensor & Water Meter**: Ensures adequate stored water and monitors overall consumption for efficiency.

- **Electricity Meter & Diesel Monitoring System**: Helps balance grid power usage with backup generator efficiency, optimising operational costs.

- **Gas Meter**: Provides accurate billing and tracks usage trends for better gas resource management.

- **Unified Reporting**: All systems integrate into the Liveview data analytics platform for seamless monitoring and decision-making.