



Tigernix Wastewater Pumping Solution

Synchronised Intelligence Oversight for
Wastewater Treatment Network

Introduction

Industry 4.0 Driven Systematic Treatment Data Orchestration

The Tigernix Wastewater Pumping Solution combines the latest Industry 4.0 digital capabilities, including AI algorithms, Digital Twin, Simulations, Satellite Live data and IoT connectivity, to form an intelligent pumping network on a digitalised canopy. This digital framework enables seamless integration across all assets, offering enhanced diagnostics, failure prediction, and operational optimisation. Through one intuitive interface, utilities gain smarter infrastructure mastery, prolonged asset performance, and a scalable, resilient pumping environment.

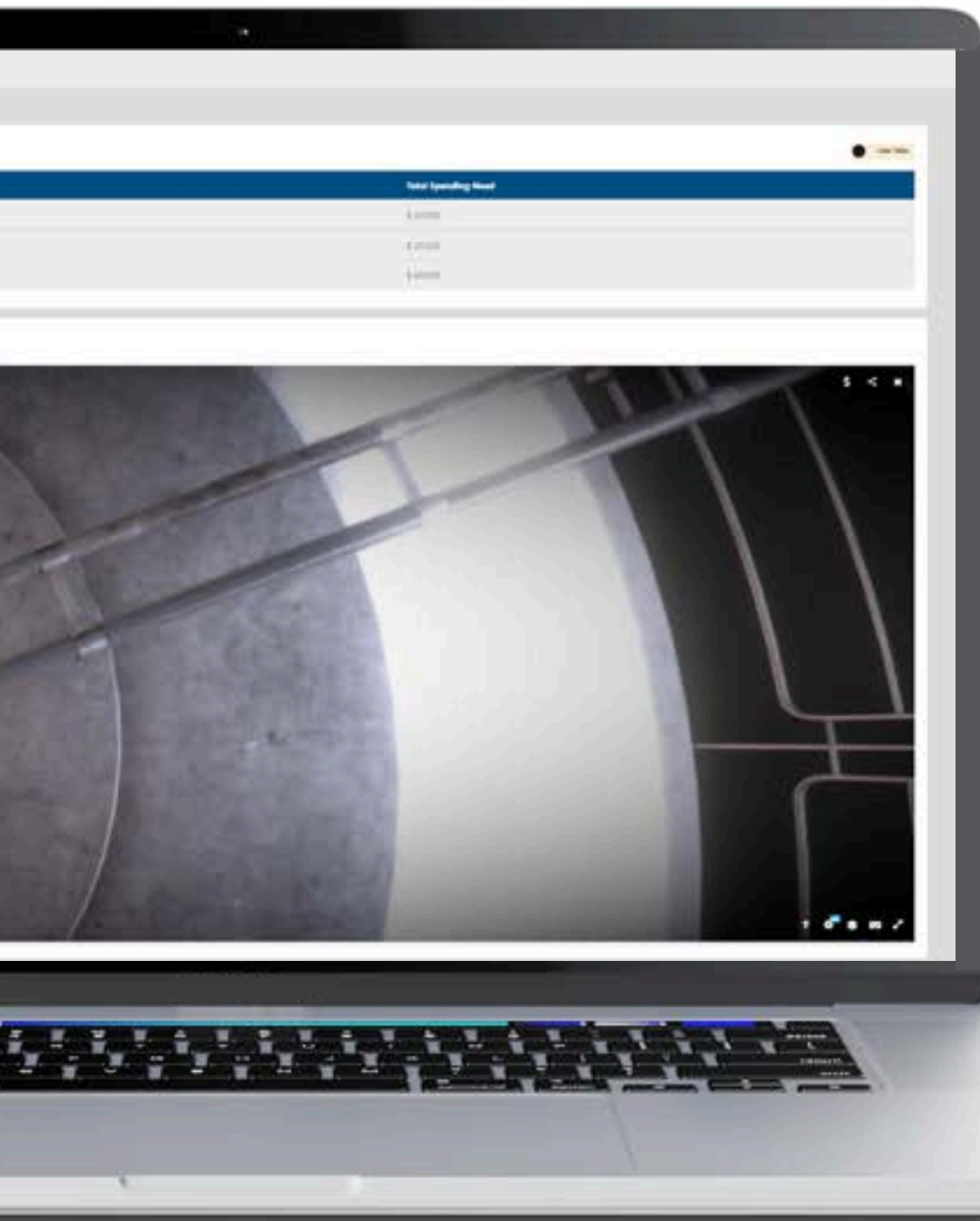


Linking Multichannel Inputs
through a Unified Data
Illustration Panel

@ Tigernix Smart Wastewater Solutions

Industry 4.0 Capabilities We Offer

- GIS
- IoT
- AR & VR
- Predictive & Prescriptive Analytics
- 5G
- Cloud Computing
- Robotic Automation
- Digital Twin
- Simulation
- Big Data



Why Choose Tigernix?

With a visionary approach, Tigernix integrates a full spectrum of pumping systems, inflow metrics, and asset health within an advanced Industry 4.0 framework, setting the stage for a new wave of operational intelligence. This integration enables utilities to apply predictive analytics, real-time insights, and proactive maintenance, optimising asset performance and lifecycle management all within a digital-based, interactive, and highly responsive architecture. Our next-gen treatment solution is simply a strategic fusion that guarantees a decade-long operational integrity.



Let your Pumping Asset Data
Narrate Your Best Operational
Excellence with Tigernix

Robust Features of Tigernix Wastewater Pumping Solution

Edge-Integrated Real-Time Telemetry Processing

- On-Device Anomaly Pre-Filtering Algorithms
- Low-Latency Sensor Data Acquisition
- Edge-Based Protocol Translation Layer

Self-Optimising Pump Control Systems

- Neural-Adaptive Flow Calibration
- Dynamic Vibration and Cavitation Mitigation
- Multi-Sensor Adaptive Feedback Loops

Geo-Spatial Hydraulic Performance Mapping

- AI-Augmented Spatio-Temporal Flow Modelling
- Digital Twin-Backed Terrain Synchronisation
- 3D GIS-Integrated Stress Heatmaps

Autonomous Fault Detection Protocols

- Neural Network-Driven Anomaly Recognition
- Self-Evolving Diagnostic Intelligence Engines
- Digital Twin-Synchronised Failure Emulation

Smart SCADA System Synchronisation

- Edge-Augmented Event Stream Processing
- Predictive Load Coordination Algorithms
- Context-Aware Command Prioritisation Engine

Pumping Asset Smart Investment Planner Mapping

- Predictive Cost Forecasting Algorithms
- Dynamic Financial Scenario Modelling
- Geo-Spatial Cost Allocation Framework



AI Risk Prediction



Downtime Cost
Reduction



Proactive Threat
Mitigation



Predictive Maintenance
Schedules

System Capabilities

Virtual Pipeline Integrity Assessment Models

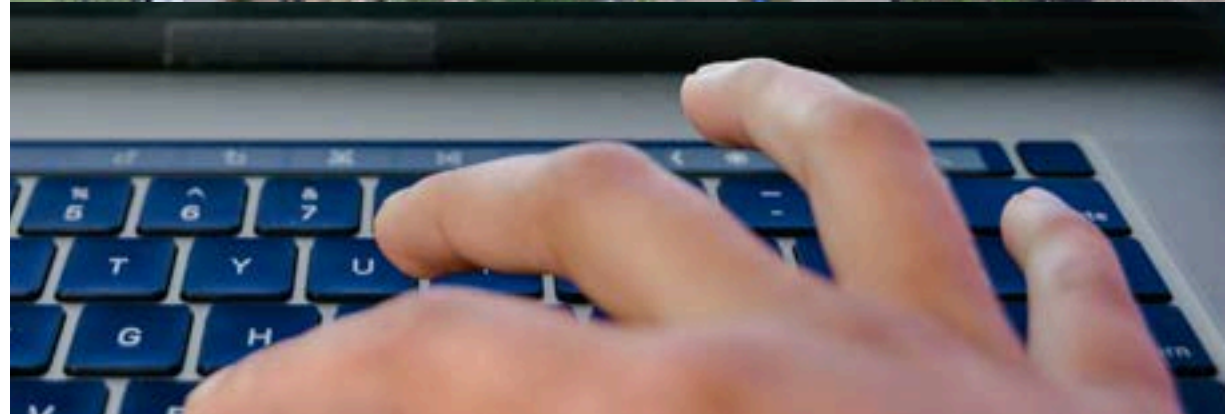
Using Digital Twin simulations, our solution simulates pipeline stressors and failure points, providing real-time analysis of structural health, identifying vulnerabilities, and enabling proactive maintenance interventions.

Intelligent Adaptive Fluid Flow Regulation Systems

Our AI-driven system autonomously adjusts flow dynamics based on real-time sensor data, optimising operational efficiency and adapting fluid regulation according to varying environmental conditions.

Predictive Energy Consumption Modelling

Utilising machine learning algorithms, this framework forecasts future energy usage based on operational patterns and environmental data, empowering utilities to optimise energy consumption and reduce operational costs sustainably.





System Capabilities

Automated Hydraulic Condition Anomaly Detection Alerts

Its embedded advanced anomaly detection algorithms autonomously flag irregular hydraulic conditions in real time, ensuring immediate alerts for preventive measures and enhancing system reliability.

Inflow/Outflow Performance Data Analytics

By aggregating live inflow and outflow data, Tigernix analytics engine delivers instant performance insights, enabling optimal decision-making and improving system resilience through dynamic, real-time flow adjustments.

Edge Computing-Driven Real-Time Analytical Insights

Decentralised edge computing processes sensor data locally, high-fidelity analytical insights, enabling real-time decision-making that optimises pumping operations while reducing cloud dependency and data transmission costs.

System Capabilities

Geo-Spatial Pumping Network Performance Analytics

By integrating geospatial mapping and IoT data, Tigernix identifies optimal pump placement and operational zones, providing spatially aware analytics that enhance network-wide efficiency and asset longevity.

Dynamic Computational Pump Load Balancing Mechanisms

The platform's AI-based algorithms dynamically distribute pump workloads, optimising energy usage and minimising mechanical strain, ensuring consistent performance by preventing overexertion of individual units.

Digital-Driven Performance Benchmarking

This system employs digital performance metrics, comparing real-time data against historical benchmarks, identifying inefficiencies, and recommending system improvements and adherence to best practices.





System Capabilities

AI-Powered Smart Wastewater Quality Analysers

Integrating AI with advanced sensor technologies, Tigernix system continuously monitors wastewater composition, detecting anomalies in quality parameters and triggering immediate corrective actions to maintain compliance.

Predictive Leakage Detection and Prevention Algorithms

Using ML models, our platform analyses historical and real-time data to predict potential leakages within the system, triggering timely interventions and preventing infrastructure failures by identifying them early.

Digital Twin Asset Lifecycle Simulators

Using Digital Twin, this framework simulates asset performance across its lifecycle, predicting wear and tear, forecasting maintenance needs, and optimising asset management by aligning operational data with long-term strategic goals.

Key Challenges & Solutions

Conventional risk management systems are typically reactive, often addressing issues only after they arise. By contrast, our AI-powered platform continuously analyses historical data, environmental variables, and real-time system behaviour to predict potential risks such as equipment failure or flooding, enabling proactive mitigation. Leveraging machine learning and predictive analytics, the system forecasts infrastructure degradation and maintenance needs.



Predictive Infrastructure Maintenance

Outdated maintenance schedules usually lead to either premature maintenance or extended downtime. Since it utilises ML and predictive analytics, our system forecasts infrastructure degradation and maintenance needs, creating optimised, data-driven schedules that reduce downtime.



AI-Driven Risk Prediction and Mitigation Engines

Conventional systems are known to be reactive in risk management. Our AI-powered platform continuously analyses historical performance data, environmental conditions, and system behaviour to predict potential risks, including equipment failure or flooding.



Key Challenges & Solutions

Addresses decentralised coordination gaps with a federated AI framework, enabling multi-station collaborative learning without centralised data pooling. Enhances regional synchronisation, data privacy, and responsiveness. Includes an AI-driven CapEx optimiser using digital twins to predict ROI for upgrades and maintenance, aligning investments with predictive analytics to cut costs and boost financial efficiency.



Federated AI Architecture for Distributed Control

We witness that decentralised pumping systems tend to lack coordination. Our federated AI framework enables multiple pumping stations to collaboratively learn and optimise without centralised data pooling. This architecture enhances regional performance synchronisation, ensures privacy-preserving data analytics.



AI-Driven Capital Expenditure (CapEx) Optimisation Model

The CapEx optimiser uses AI and digital twin simulations to predict ROI from infrastructure upgrades, preventive maintenance, and performance retrofits. By aligning investment decisions with predictive degradation patterns and lifecycle analytics, utilities can reduce unnecessary spending and maximise infrastructure financial efficiency.

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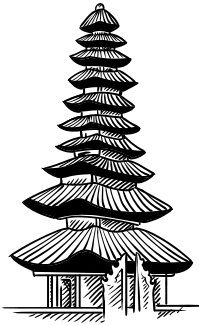
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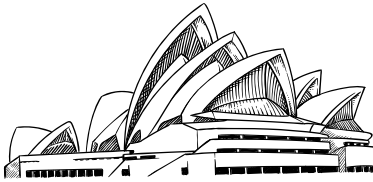
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