**PROGRESSIVE CONTROL SDN BHD** (1351476-U)

**End-to-end monitoring of KPIs – Water treatment plants, distribution pipelines and pump stations.**

# TheCode IIoT Remote Monitoring & Management System - Water Infrastructure

# Introduction

The Industrial Internet of Things (IIoT) is the use of smart sensors and actuators to improve manufacturing and industrial processes. IIoT is an important part of what is described as the Fourth Industrial Revolution, or Industry 4.0. IIoT utilises the power of smart machines and real-time analysis to take advantage of the data that machines have produced in industrial settings for years. The driver behind IIoT is that smart machines are not only better than people at capturing and analysing data in real-time, but that they are also better at communicating important information faster and more accurately.

With the advancement of IIoT technology, water supply facilities shall be equipped with a future-proof, round-the-clock, cost effective and intelligent monitoring and management system. With the rising cost of living and need for larger water supplies, supervision of end to end water infrastructure must rely on science and technology to prevent water wastage and supply disruption and to relocate valuable technical resources from repetitive operation activities to other more critical decision making tasks. Additionally, implementing an advanced monitoring and management system equips personnel
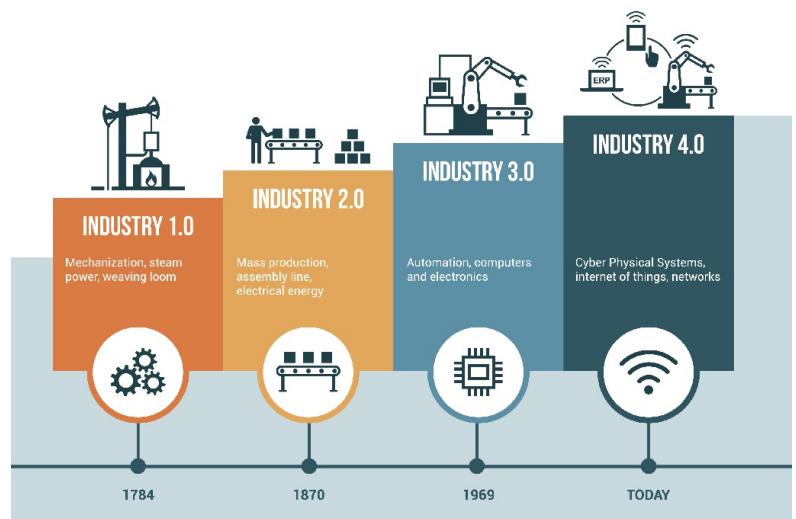
## TheCode IIoT

### Key Features

- Scalable cloud-based operation and analysis solution

- Incorporate latest LoRaWAN and 4G/5G wireless technologies for secured end-to-end data delivery

- Ready to measurement from new or existing IIoT and Non-IoT sensors and devices

- Real-time KPI data visualization, analysis and notification

- Localised intelligent automation and decision making

- 3rd party integration API ready

- Local professional services

from various departments to view, extract, compare and analyse relevant measurable key performance indicators or KPIs to assist them making accurate decisions on infrastructure upgrade, troubleshooting and maintenance cycles.

TheCode IIoT Remote Monitoring & Management System - a total home-grown operation and analysis system to securely and wirelessly connect essential IIoT sensors attached to each key component within the water infrastructure. It is a unique solution that combine both state of art automation and machine learning technologies and strong in-house R&D to deliver a secured, personal, feature-rich, environment-aware, cloud-based and intelligent monitoring and management platform for operation needs.



Coupling with our years of IT knowledge and strong technical support, TheCode strives to unlock the future by bringing in tomorrow technologies to your home and to experience a true smart home solution that brings convenience, comfort and peace of mind.
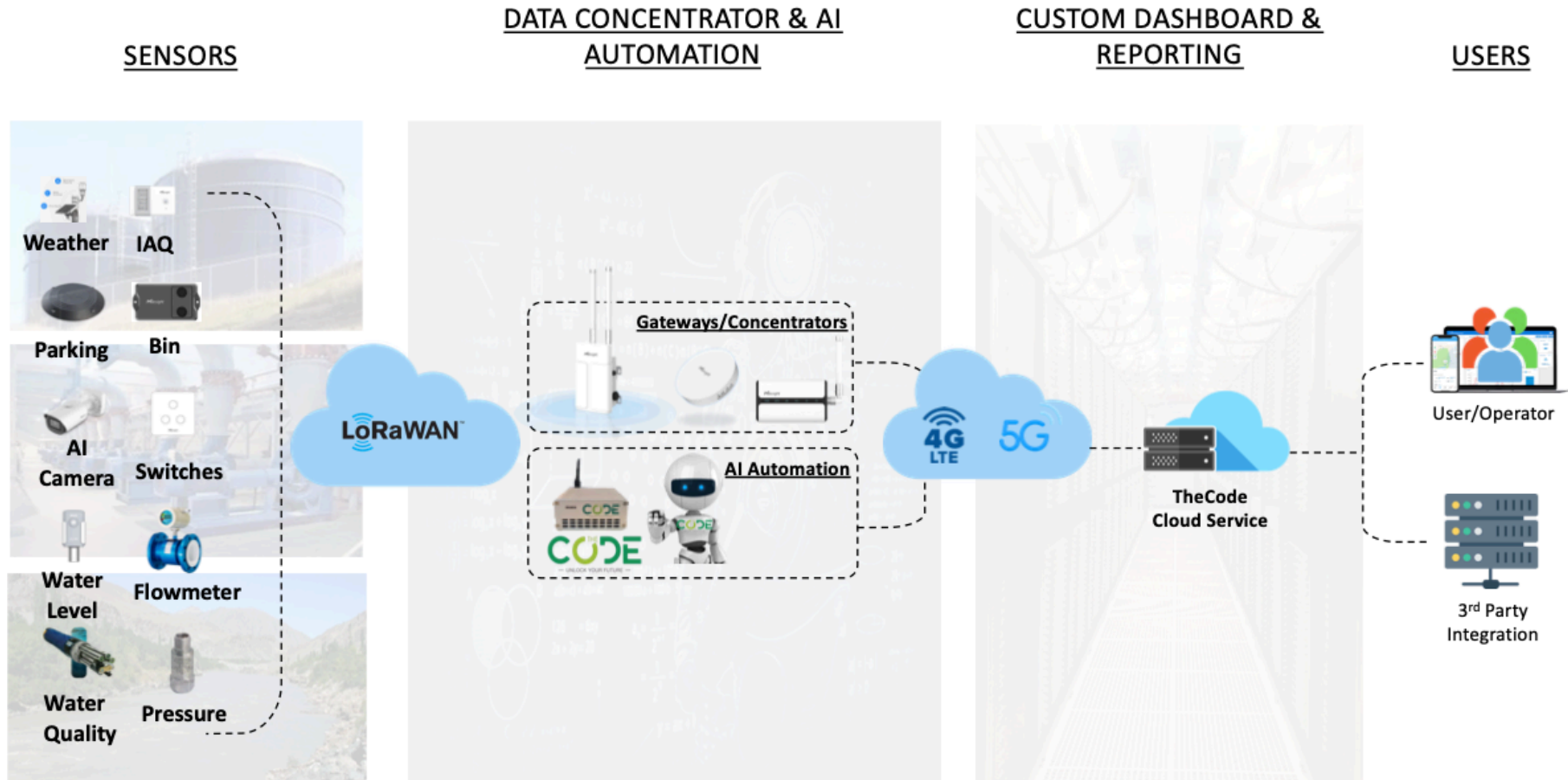
# System Architecture and Key Design Features

TheCode IIoT Remote Monitoring & Management System for Various Industries

# System Block Diagram

# Dashboards and Reports

Mobile App



Mobile Application (IOS, Android) provides technicians instant view of pump station, pumps, control panels and any key components. The app allows the technicians to have a quick glance of all pump station status, and traverse to individual component metrics. Additionally, the app also provide some intuitive graphs to assist them troubleshooting. The app also include latest alerts and warnings associated to pre-defined thresholds.

Desktop View
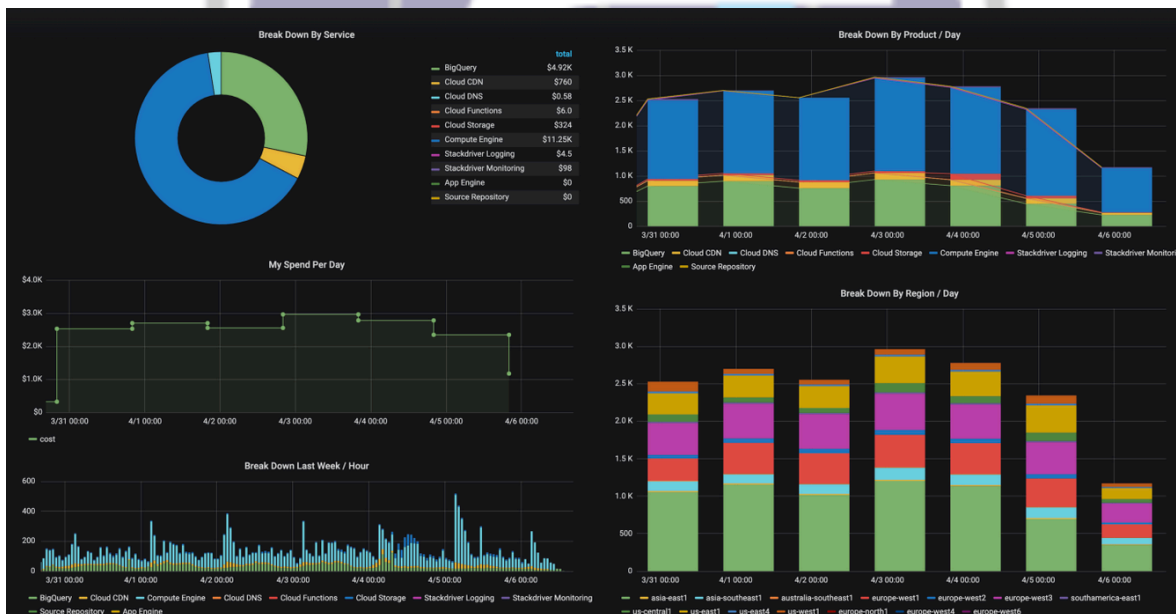


Customizable dashboard allows operators to view high level and informative data with regards to the health of overall pump stations. From there, they can zoom in to a very specific metric and date time for fault reporting.
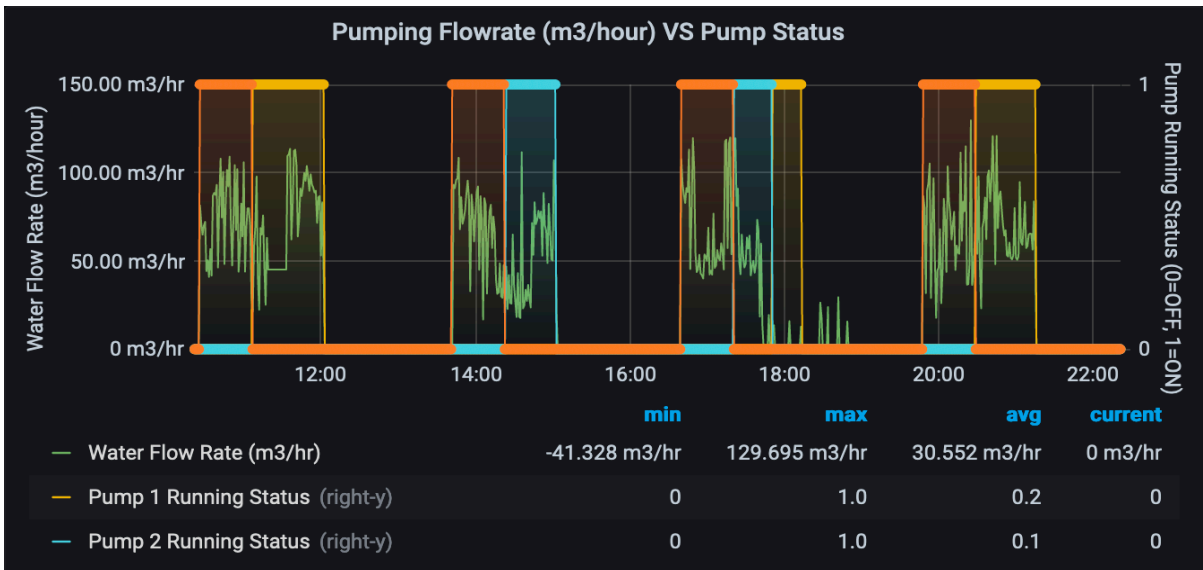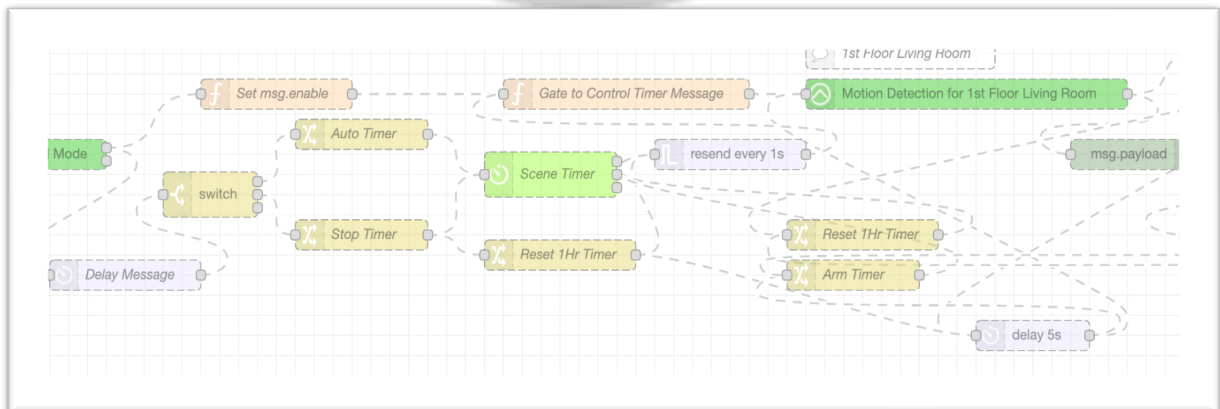
Each metric can be plotted against any metric that to meet planner needs. Data can be stored for more than years for analysis and planning.
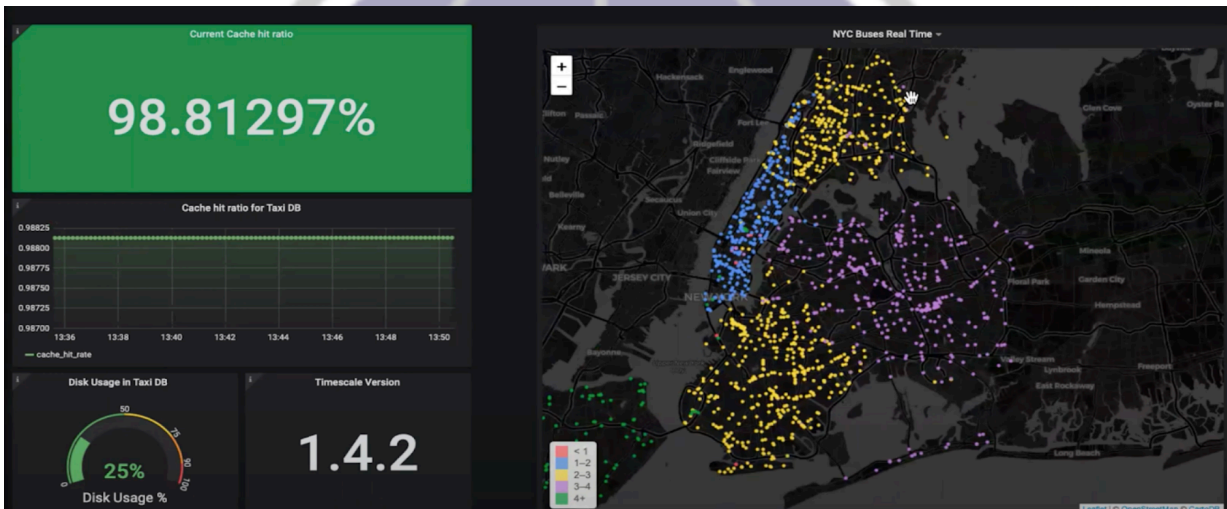


Not all the standard charts meet every customer needs. Customization service plays an important role in delivering the right presentation of data according to the operator, technician and planner requirements.



Graphical logic editor provides a powerful tool to draft the automation flow that meets the customer requirement.

## Application Scenarios

**Remote monitoring system and management to increase efficiency of pump station**



Pumping station

The monitoring system is suitable for use on various types and sizes of pumping station. We can monitor a single or multiple pumps as well as associated equipment such as flow meters, level and vibration meter, pressure transmitter etc. If it needs to be monitored, then our system will collect the information

Build-in remote pump monitoring and control

With tolerable effort and time this solution-ready platform supports system integrator in monitoring and control of pump stations in diverse sizes.

Supports Multiple Wireless Solutions

Different field sites or projects may require different types of wireless connection. The open system architecture allows for 2G/3G/LTE/Wi-Fi/LoRa/802.15.4 solutions with minimal system changes.

Access to dashboard and datasheet

Log into your account or access using a smart phone and the graph / datasheet page pops up in a new window, the graph displays all the readings for today; change the date range and press refresh to extend your search. Graph pages have a 'click to download data' button so you can save the data on your own PC for use in spreadsheets and your own reports.

# Water Quality Monitoring and Management



## River upstream

Integrate with industrial grade water quality and depth sensors such as YSI EXO, Pulsa dBi HART Intelligent Tranducers, are deployed at river upstream to gather KPIs such as turbidity index (NTU), water contaminations index, salinity level, ammonia, water level. These KPIs are streamed continuously via LORA proprietary wireless technology to TheCode Gateway located at treatment plant.



## KPI monitoring and actionable response

Graphical logical editor allows operator to decide "what-if" scenarios design. For example, if NTU index is progressively increased in the last 15-30minutes, suction pumps shall be stopped entirely to prevent muds or sands causing irreversible damage to the pump seals which could be costly to repair let alone disrupting water intake.
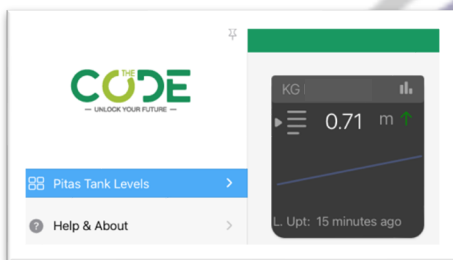
**Storage Tank Water Level Monitoring**



Storage Tank



With TheCode IIoT, technicians and operators no longer need to be always at site to measure or view storage tank water level. By installing a battery-operated, sturdy and contactless ultrasonic sensor, real-time water level data can be securely and reliably delivered to authorized mobile phones and desktops with ease. To consolidate multiple sensor readings from different storage tanks and equipment at once, TheCode IIoT leverages on ultra-long range LoRaWAN open-standard wireless infrastructure to economically deliver important readings without subscribing to many telco SIM cards. Additionally, ease-to-maintain LED display can be optionally installed on storage tank, in an office or anywhere at customer choice for live visual reading.
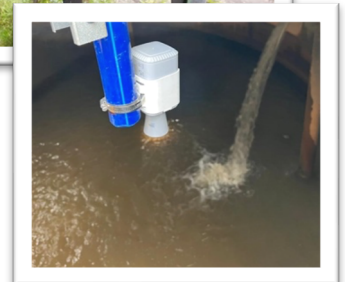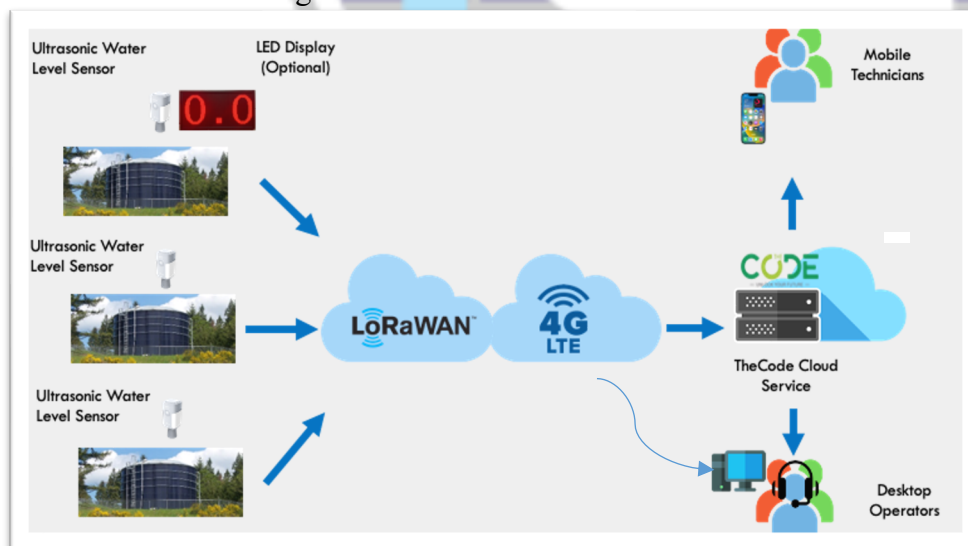
## Why TheCode IIoT

### Cloud-based
We provide cloud server platform with minimum cost of ownership. Our system was established to provide strong security protection, data storage, graphical interface, trend, graph with alarm and control capabilities.

### Cutting Edge Wireless Technologies
Our solution uses private low-power and long-range LoRaWAN wireless technology for remote sensor data collection and control. Coupled with telco 4G/5G networks, our customers have thousands or millions of real-time metrics on their fingertips.

### Mobility
One of the strongest advantages of our system is mobility. Users can access to remote sensor data at anytime and anywhere. Additionally, the mobile application provides an access for authorised users to remote control key assets without presence at sites.

### Data Analytic with Machine Learning
Our machine learning can help to demystify the hidden patterns in collected sensor data by analysing massive volumes of data using well established algorithms.

### Instant Alarm
Instant notification of sensor alarms through sms, mobile apps, email and even voice calls. User can also acknowledge and take immediate action to the alarm. Pumping station downtime will be minimized.

### Hassle Free Web Access
Our solution is accessible through any computer PC with internet access. No special program needed to be installed, only normal web browser is required.

### Web API
Our solution is ready for external data integration via REST API. Rest assures that 3rd party OSS and BSS solutions seamlessly extract important and relevant data for their usage.

### Professional Services
We have a strong R&D team that is ready to customize any report, dashboard or business flow to meet our customer needs.

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