PROPOSAL FOR SMART ENERGY MONITORING &

Temperature Humidity Monitoring.

Developed by: Dialog Broadband Networks (Pvt.) Ltd. – IOT BU

Beneficiary: Dialog Axiata PLC. – G Tech.

Dialog ENTERPRISE

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ABBREVIATIONS

SIMA: Smart Infrastructure Monitoring & Automation

1. NON-DISCLOSURE

2. INTRODUCTION

As Sri Lanka's premier connectivity provider, Dialog Axiata PLC has been home to groundbreaking technological advancements in Sri Lanka. With sustainable innovations happening all around the world, Dialog intends to leapfrog industries in emerging markets to the fourth industrial revolution to elevate the country's economic growth. To achieve this end, our portfolio includes a wide range of products and services targeting multiple verticals including agriculture, logistics, healthcare, education, banking & finance, maritime & ports etc.

Manufacturing sector digitization is also one of the key areas of focus of Dialog as digitization of the sector will help streamline all aspects of the industry to make the end to end operations more convenient, efficient & profitable.

2.1 OBJECTIVES

The main objective of this proposal is to provide an overview about the Smart Energy Monitoring Solution and the proposal will include the following information in a high-level.

i. Information regarding the proposed Smart Energy Monitoring solution.
ii. Financial considerations for the proposed solution.

3. PROPOSED SOLUTION

3.1 SMART ENERGY MONITORING SOLUTION

Real-time energy data is a key metric for an energy management program to be successful. With live data being collected, the question becomes how to organize and review it. This is especially critical for organizations that are balancing a variety of business operations. Being able to monitor energy data in real time provides an understanding of energy consumption and performance across separate operations units.

With real-time monitoring of energy parameters, organizations will have a closer visibility on noticing & explaining excessive energy consumption, quantify energy saving potential & uncover saving opportunities, ensure more efficient maintenance, build reputation & promote positive corporate social responsibility in reducing the carbon footprint etc.

Dialog's Smart Energy Monitoring Solution is a revolutionary solution that facilitates, monitoring the consumption of electrical energy, important parameters related to electricity and transmits data in real time to a centralized, cloud hosted platform. This allows organizations to monitor the usage of energy, allowing cost-effective energy management & planning while also contributing to environmental sustainability.

This low-cost IoT solution allows careful monitoring & inspection of various parameters within a premise by providing alerts & notifications to help sustain the consistency. The main parameters monitored include electricity parameters including energy, phase wise current, phase wise voltage, phase active power, phase wise reactive power, phase wise power factor etc. to support energy optimization.

A front-end application will also be provided for data visualization and the solution will leverage the capabilities of key technologies such as Artificial Intelligence, Machine Learning, and Internet of Things. The below diagram shows the high-level architecture of the proposed solution with all the key components including the temperature & humidity sensors and the gateway device. The data captured via the sensory devices will be displayed on the '**Smart Energy Monitoring**' widgets of the Dialog SIMA platform in real-time.

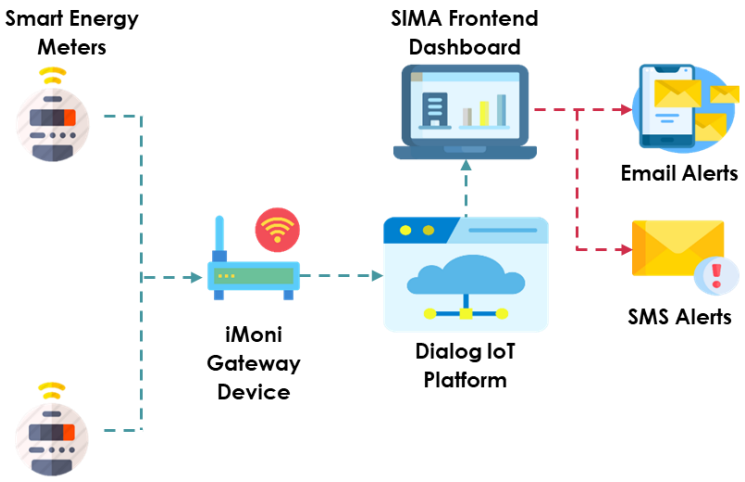


Figure 1: Solution Architecture of the Smart Energy Monitoring Solution

The Dialog Smart Infrastructure Monitoring & Automation (SIMA) solution provides organizations the ability to remotely monitor and automate infrastructure, along with analytical information necessary for real time decision making and long-term strategy determination. The solution supports monitoring of various infrastructure verticals including environmental conditions, power, energy, water consumption, generator etc. with the objective of lowering infrastructure related costs and improving operational efficiency.

The gateway device, iMoni which was developed in collaboration between the Dialog Axiata PLC and Dialog-University of Moratuwa Research Laboratory, consists of multiple interface protocols which enables organizations the advantage of connecting their existing devices and onboard them to the Dialog IoT platform which has made the solution effective and cost efficient.

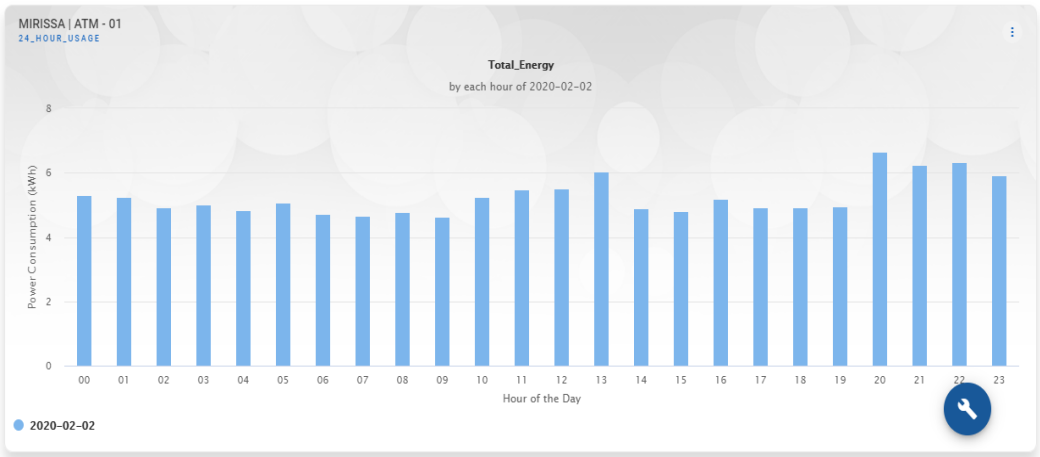
iMoni comes with Smart Infrastructure Monitoring and Automation (SIMA) platform portal which provides the customer a graphical user-friendly application that can be accessed from anywhere in the world. The solution will provide additional facilities such as monitoring and automation of critical scenarios and triggering of push notifications via SMS and other means in order to make the administration process more effective and streamlined.

Some of the key features of the Smart Energy Monitoring solution are mentioned below.

Key Features

- View the total power consumption of each location in the below-mentioned intervals, instantly on the dashboard
    - **Current Meter Reading:** Smart Meter reading from the date of installation
    - **So Far Today:** Total consumption of the day from midnight till now
    - **Month to Date (MTD):** Total consumption of the month (from 1st of the month 12.00 AM to date)
    - **Last 30 Days:** Total consumption of the last 30 days
- Graphical view of power consumption of locations.
    - **Total Consumption of the Day in Hourly Intervals:** Analyze and compare the power consumption of the selected day in hourly intervals, allowing the corporate admin to identify peak hours and unusual power consumption and behavior.

    - **Total Consumption of the Month:** Analyze and compare the power consumption in daily intervals of a selected month, allowing the corporate admin to identify peak hours and unusual power consumption and behavior.



3.2 SMART SERVER ROOM MONITORING SOLUTION

Many modern office spaces utilize enclosed spaces, aka server rooms to provide a central point for organizations to manage their data storage servers & other computer networking devices. The design of these environments must take into consideration network connectivity and power, room temperature control and ventilation, room and rack security, fire & seismic protection and much more.

Likewise, one of the most important elements of managing a server room is regulating the space's temperature. If the computer hardware or IT equipment were to overheat, it could critically impact the performance, productivity, and stability of a business' operations. Hence, monitoring of these temperature & humidity parameters in real-time plays a vital role in maintaining these conditions at a constant level.

Dialog's Smart Server Room Monitoring Solution mainly focuses on developing a low-cost IoT solution allowing careful monitoring & inspection of these temperature & humidity conditions by providing alerts & notifications to help sustain the consistency.

A front-end application will also be provided for data visualization and the solution will leverage the capabilities of key technologies such as Artificial Intelligence, Machine Learning, and Internet of Things. The below diagram shows the high-level architecture of the proposed solution with all the key components including the temperature & humidity sensors and the gateway device. The data captured via the sensory devices will be displayed on the '**Smart Server Room Monitoring**' widgets of the Dialog SIMA platform in real-time.

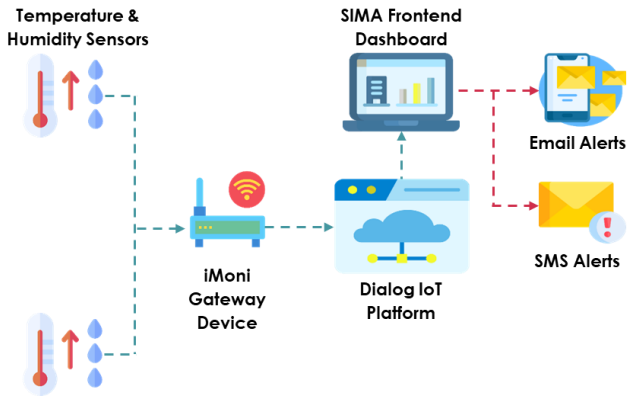


Figure 2: Solution Architecture of the Smart Server Room Monitoring Solution

The Dialog Smart Infrastructure Monitoring & Automation (SIMA) solution provides organizations the ability to remotely monitor and automate infrastructure, along with analytical information necessary for real time decision making and long-term strategy determination. The solution supports monitoring of various infrastructure verticals including environmental conditions, power, energy, water consumption, generator etc. with the objective of lowering infrastructure related costs and improving operational efficiency.

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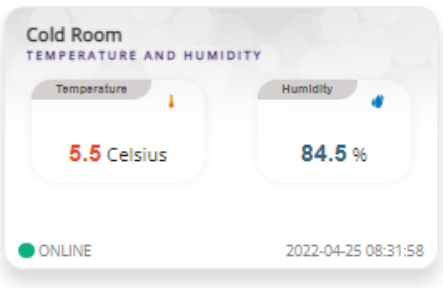
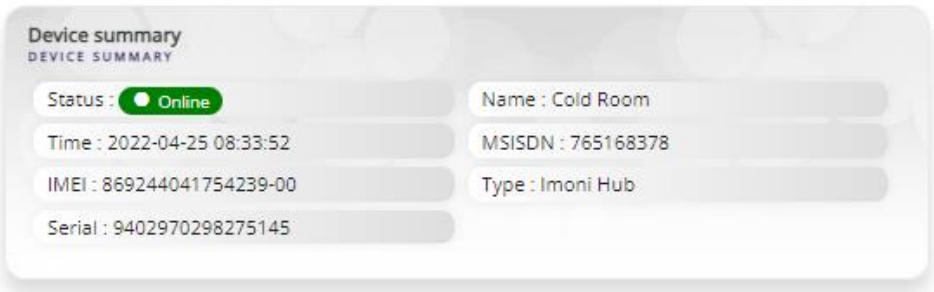
Some of the key features of the Smart Server Room Monitoring solution are mentioned below.

Key Features

- Remotely monitor the temperature & humidity conditions of all locations accommodated from a single, centralized dashboard.
- View the temperature & humidity conditions of each location as shown below and during the below-mentioned intervals, instantly on the dashboard.
    - Temperature last 24 hours
    - Hourly Temperature



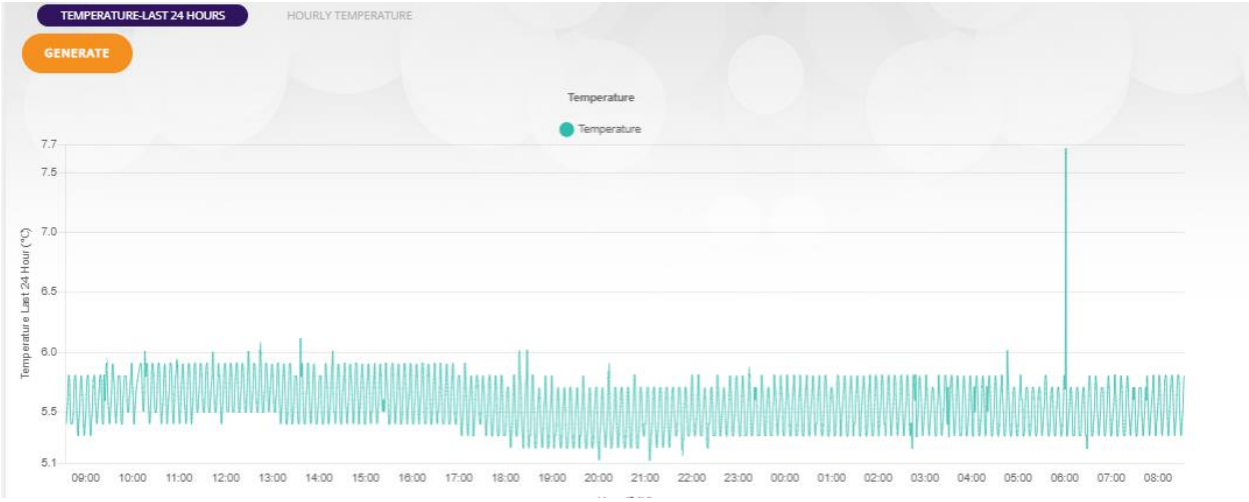


The proposed setup will focus on monitoring the temperature & humidity of the server room and the infrastructure required is summarized as shown below.

Temperature Humidity Summary

TEMPERATURE HUMIDITY SUMMARY

	Temperature	Humidity
MIN	5.2 °C 25-04-2022 02:43:58	77.6 % 25-04-2022 07:48:12
MAX	7.7 °C 25-04-2022 06:01:32	87.8 % 25-04-2022 00:01:35
AVG	5.54 °C	82.64 %



4. FINANCIAL CONSIDERATIONS

The table below shows the detailed cost breakdown of the proposed solution. The customer needs to manage the installation.

The following pricing is only for Malabe 10K sites.

#	Device	Qty	Device Cost (LKR)	Total One Time Cost	Monthly Rental (LKR)
1	iMoni Zero	8	22,500.00	180,000.00	8,000.00
2	Power Analyzers - 1130H	16	40,365.00	645,840.00	N/A
3	Temp & Humidity Sensor (SHT20)	36	5,000.00	180,000.00	N/A
				1,005,840.00	**8,000.00**

5. Terms and Conditions

- Contract period: Minimum 1 year. (Subjected to auto-renewal unless either party changes any terms with prior notice)
- The validity of this proposal will be 15 calendar days from the date of submission of the proposal.
- Additional transport & accommodation are not included
- Upon acceptance of this proposal, the customer shall enter into a separate contract with DBN for the services agreed to with parties with a minimum period of one year (service charges to be paid monthly , in addition to selected set up fee option)
- Ownership of the devices will be under Dialog during the first year, after that, it will be transferred to the customer.
- After 1-year, contract to be resigned only if there is a change introduced upon mutual agreement of the parties & financial impact to be reviewed in line with the introduced changes
- The above rates include a one-year hardware warranty with maintenance & support (If agreed on the AMC plan). Device replacement by Dialog is only limited to manufacturing faults. Device failure or damages due to negligence (Ex. Drop damage/liquid damage) or lightning, power surge, etc. will not be covered under warranty).
- It is the responsibility of the customer to provide the necessary protection against lightning, power surges, etc.
- After a one-year warranty seizes, the customer should bear device/labor/material costs of repair or replacement services.
- Monthly solution rental is for two authorized recipients nominated by customer per branch-to receive SMS summary updates, threshold alerts, and portal access.
- Rectification of any damages to the installed solution hardware after commissioning is the responsibility of the customer at its own cost. DBN shall not take any responsibility for damages to installed solution hardware after successful completion of the user acceptance test.
- Prices may be revised (yearly) in the event of changes in the indicated Investments and exchange rate.
- Termination of the contract before the agreed contract period will be subjected to an early termination fee, i.e. The balance to be paid on monthly basis as a termination fee subjected to terms & conditions decided by DBN.
- Service level support will be for both hardware/software available during business hours only (Monday to Friday 8. am to 5 pm.)
- Customer real-time data will be stored for a period of 06 months in the live environment and the customer's system admin is advised to backup historical data from the system periodically
- Historical data will not be available to the customer during periods of Service disconnection due to credit action by Dialog or during times of power outage resulting from a loss of data records
- Dialog will maintain periodic backup system restoration files as part of the services offered.
- A delivery plan will be agreed upon awarding. A Project Manager will be appointed from Dialog DBN to ensure smooth implementation

6. System Support

For the system, support feels free to contact our team at any time on the below contact points.

Tel: +94 (0) 117 100 200

Email: smartbiz.support@dialog.lk

7. Prerequisites from Customer

To provide the solution, Dialog Broadband Networks (Pvt) Ltd. wishes to request and obtain the following:

1. A letter/e-mail acknowledging this proposal and the provision of approvals for us to commence solution implementation

2. Technical personnel from each site to be nominated and provided on-site, throughout the solution implementation period

8. REFERENCES & RECOGNITIONS

Nestlé, Dialog Enterprise launch Sri Lanka's first automated food cold storage temperature monitoring solution

Delivers hi-tech advancements in storage quality assurance

NESTLÉ Lanka has launched an innovative solution for managing and monitoring its cold storage temperature, developed by premier business solutions provider, Dialog Enterprise. The solution is the first of its kind in the local food industry.

It will automate the maintenance of optimal conditions for Nestlé's cold storage of raw materials, by triggering alarms and push SMS alerts if there are fluctuations in temperature and humidity. Unlike the previous manual monitoring system, the new solution will help enhance Nestlé Lanka's best-in-class stringent quality management systems, by leveraging advanced technology, connectivity platforms, and data analytics.

"Ensuring quality and food safety is our top priority and applies to all our products, systems and services. We take pride in the fact that Nestlé's name on a product is a guarantee of quality, and we work hard every day to continue improving this key strength. We're pleased to partner with Dialog Enterprise in launching this industry first," said Nestlé Lanka Managing Director Fabrice Cavallin.

"The cold storage temperature monitoring solution recently launched by Nestlé is a great example of open innovation, where both the Nestlé and Dialog Enterprise Solution teams worked together to create business value. We are pleased to support a global brand and company such as Nestlé to maintain its high food safety standards," said Dialog Axiata Group Chief Executive Officer Supun Weerasinghe.

Dialog Enterprise's Cold Room Temperature Monitoring System (CTMS), based on state-of-the-art Internet of Things (IoT) technology, improves operational efficiency and quality control. In addition to temperature and humidity monitoring, the solution offers cloud data collection and storage for data analytics. Further, it has an active roadmap to leverage interconnectivity, automation, machine learning and real-time analytics to adapt to industry 4.0 applications and further enhance cold chain logistics.

Nestlé Manager – Factory Warehouse Sanjeewa Amunugama

Nestlé Lanka's factory in Pannala

Figure 2: Reference Use Case for Cold Room Monitoring Solution

[1] https://island.lk/sri-lankas-first-automated-food-cold-storage-temperature-monitoring-solution/

[2] https://www.dialog.lk/first-iot-based-smart-grid-solution-to-support-prepaid-electricity-metering/

[3] https://www.ft.lk/IT-Telecom-Tech/Dialog-wins-Industrial-IoT-Initiative-of-the-Year-at-GLOTEL-Awards-2019/50-690515

[4] https://www.dailynews.lk/2019/12/03/finance/204547/slasscom-honors-most-innovative-technology-product-and-service-companies