

Advanced Tower Monitoring



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Background

Telecom towers are the key ingredient in ensuring the telecom operator's quality of service and are an important determinate of the telecom company's success. Effective tower management is essential for telecom operators and providers to maximize their profits and reduce operational costs. With continuous structural health monitoring solutions, you can catch signs of undesirable behavior of tower bodies, antenna arrays and other components at the earliest possible stages – often well before physical inspections. With early detection, you can make informed decisions about the best course of action to take to minimize complications and prevent subsequent failures.

Challenges

The biggest challenge faced by tower operating companies in India is the availability of Grid power. In regions where a power shortage occurs, there can be outages of up to 12 hours a day. In such cases, the operator needs to supplement the Grid power with diesel generators and battery banks. With the rising fuel costs and awareness of the environmental impact of fossil fuel powered systems, it becomes imperative to optimize the resources. The operating costs incurred in such situations can be very high.

While the tower operator might recover these costs from the telecom companies using the tower, the companies themselves might be reluctant to pay out the charges without satisfactory knowledge that there has been no misuse of the resources. This could be inaccurate billing, misuse of the electricity, or theft of diesel.

Another area of concern is the condition of the Shed which stores the main electronics. By monitoring the temperature, smoke, and other environment variables, action can be taken if there are any anomalies in these parameters. Alerts can be generated in case of emergency situations such as the presence of smoke and high temperature, which can indicate a fire.

Solution

In the era of the smart and the convergence of technologies, we at CASCADEMIC extended and evolved our decades of embedded expertise from the SCADA to the M2M & Growing IoT space. Advanced Tower Monitoring Solution is designed to remotely monitor cell tower systems. With highly integrated software and stable hardware, all data can be accessed from a remote location which allows you to have constant control over the cell towers deployed in the respective networks. Real Time notifications and alerts are provided to monitor energy consumption, hardware health and integrated security systems.



The main controller is a standard industrial grade module with wired interface (RS-485 MODBUS-RTU) and 8 Analog input channels (with isolation) for current measurements. Its modular architecture allows for various wireless sensor modules to send data through Lora and GSM Modules to the cloud. Energy consumption of each tenant can be measured up to 75 A with 3% accuracy. Hardware health and security are monitored with a temperature and smoke sensor, with an electronic lock that prevents unauthorized access to the Tower Monitoring system enclosure. Door open/close installed on the shed door as well as the Tower Monitoring system enclosure indicate when someone has entered the premises and accessed the device.

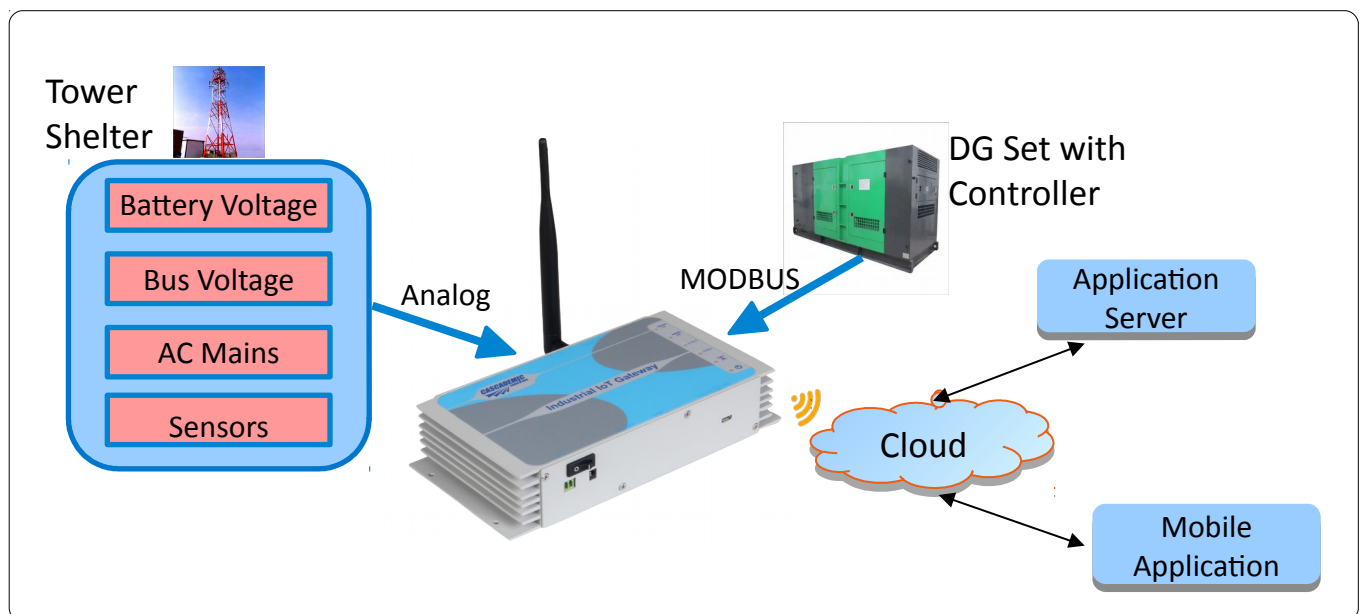
Value Proposition

The solution delivers business value through:

- Reduced down time of Telecom Tower enabled by live monitoring of SMPS powering the tower
- Reduced in Operational Cost of Telecom Tower by monitoring Grid power, DG, and Battery voltage and current
- Higher Asset Utilization with continuous monitoring
- Theft and Losses: Constantly monitoring the fuel level within the diesel generator, the telecom tower operator is able to identify the fuel thefts, in case of any, and are able to control their costs on the fuel

Pay as you use concept for the Individual Tenants. With the passive and active infrastructure shared between multiple operators within the infrastructure, there was a need from the individual tenants for the monitoring of their power consumption. With the non-invasive rugged current sensors, our solutions aims at solving this problem by reporting the monthly power consumption of the tenants within the infrastructure.

Alarms, Incident and Ticket Management: Efficient ticket management based on alarms and alerts helps in reducing the operational cost and increase in up time of the telecom towers.



Sensors Support

- Temperature Sensor: Detect temperature in the Shelter
- Fuel Sensor in Diesel Generator
- Vibration Sensor for Diesel generator
- Door open Sensor for the device
- Door open Sensor for the shelter
- Remote door lock for the device
- Tamper alert, Smoke, DG Vibration, DG Fuel

Cloud Connectivity

- Facilitates the cloud access and the edge processing
- Also supports for the server based application.

