Creating Smart Campus with BMS Systems: Real-time Monitoring and Control of HVAC Systems to Maximize Energy Efficiency and Sustainability

Abu Dhabi, UAE | LoRaWAN

Milesight Partner	Location	Number of Devices Deployed	Applications
ADEEB ELECTRICAL& ELECTRONICS SERVICES COMPANY- SOLE PROPRIETORSHIP L.L.C	Abu Dhabi, UAE	VS121*100, AM103*50 UG65*10, UG67*4	Smart Campus, Smart University, Smart Building

Success Story

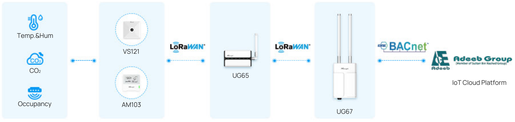
Background

Gartner identified intelligent campuses as one of the top 10 strategic technologies impacting higher education. The organization defines a smart campus as "a physical or digital environment in which humans and technology-enabled systems interact to create more immersive and automated experiences for university stakeholders." Indeed, next-generation campuses are very different from the universities and colleges of the past and, in many cases, from those of today. Higher education facilities around the world are prioritizing smart campus design to improve student outcomes, reduce costs, and future-proof their schools. This is a response to the increasingly dynamic use of campuses and the pressure on resources, including energy, financial and human. The Internet of Things (IoT) can help provide helpful insights based on big data on usage patterns.

Challenges

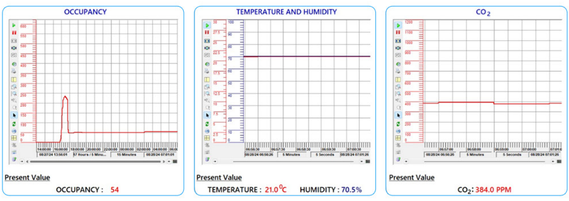
For better management, the University has established its own BMS. To improve overall performance, occupancy data and air quality data are now required, all of which are ideally integrated into the existing BMS platform so that the upgrade can be accomplished in the most cost-effective manner. In addition to the sensors, the range of LoRaWAN gateway options available was challenging due to the building topology.

Solutions



In this project, our partner ADEEB Group, has successfully deployed IoT solutions designed for the university in Abu Dhabi, transforming into smart buildings in campus. The deployed system monitors the occupancy of the space with the help of VS121 AI Workplace Occupancy Sensor and control the operation of the area as per the feedback received from the AM103 3-in-1 IAQ Sensor. By monitoring CO_2, temperature and humidity in real time, the facility manager can have more accurate data on the environment. For example, during the school day, when the occupancy sensor detects that an area is occupied and the CO_2 concentration value reaches a threshold, facility managers can be informed and adjust the HVAC system accordingly. In this way, the comfort of students and staff can be better guaranteed. Alternatively, when a "ghost room" is present, occupancy sensors will report that the room is "vacant," thereby notifying staff. As a result, lights and air conditioning can be turned off to avoid unnecessary waste, while also freeing up the use of the room for more people in need.

Having the appropriate source of data is incredibly important as not all will provide the same accuracy and quality. Embedded AI algorithm, AI Workplace Occupancy Sensor is able to accurately realize counting with up to 98% high accuracy. The accuracy gets enhanced with continuous deep learning. With 3-in-1 IAQ Sensor, real-time and accurate data is available. This is suitable for bench-marking and developing ventilation, filtration, and other indoor air quality management strategies.



Given that Milesight UG65 Semi-industrial LoRaWAN® Gateway supports for BACnet/IP, real-time data can be seamlessly integrated into existing Building Management System (BMS). Here, LoRaWAN® serves as data channel to the control applications without any changes to BACnet protocol network. All data collected by AI Workplace Occupancy Sensor and 3-in-1 IAQ Sensor are then sent to BMS system as BACnet points. Additionally, a UG67 Outdoor LoRaWAN® Gateway is located at the top of the building, acting as a master (in fleet mode) and providing a backup cellular connection to the Internet.

Results

Improving the Student Experience with Good Comfort

Real-time monitoring of carbon dioxide levels in indoor air and increasing ventilation rates in a timely manner can help reduce the incidence of symptoms such as dizziness and chest tightness, as well as provide long-term health benefits. In addition, the ability to concentrate and solve problems improves significantly with improved indoor air quality within acceptable CO_2 levels.

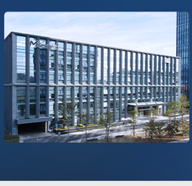
Zero Net Contribution for Sustainability

With real-time monitoring, unnecessary costs and energy consumption can be identified so that facility managers can take timely action. There is no need to keep the ventilation system on all the time. Users can only activate the ventilation system when an alarm is received, which helps to conserve energy and further reduce carbon emissions, thus promoting a more sustainable lifestyle.

Supporting Data-Based Decision-Making for Better Operations

With all the data collected and presented by the BMS, facility managers have a comprehensive view of overall performance. Based on current and historical data, more insights can be inspired to drive scientific decision-making.

Why Choose Milesight



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Partner

About
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About ADEEB ELECTRICAL & ELECTRONICS SERVICES COMPANY- SOLE PROPRIETORSHIP L.L.C

Adeeb Group is a leading IMS-certified organization, holding certifications in ISO 9001, 14001, 45001, 41001 (Facility Management), and 50001 (Energy Management), along with OSHAD and Total Quality Management (TQM) standards. Established in 1994 and headquartered in Abu Dhabi, we were honored with the SKEA 2015 (Silver Category) award for excellence in Facilities Management and MEP Contracting Services.

We offer a comprehensive range of integrated facility management and MEP contracting services across diverse sectors in the UAE and Seychelles. Beyond Facility Management and Maintenance, our expertise extends to IoT solutions, Automation, and Energy Management, delivering innovative and sustainable solutions tailored to our clients' needs.

Our services verticals are as follows :

- IoT & Building automation system
- EV chargers
- Energy management services
- ELV systems
- Integrated facilities management services
- Intelligent lighting control system
- MEP contracting
- Fire fighting & Fire alarm services
- Smart HVAC solutions

Milesight

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