Integrated Controlled Environment

PICT, PUNE

Project Duration: May 2022 - November 2022

Objective:

The objective of the Integrated Controlled Environment project was to develop an innovative and energy-efficient system that optimizes electricity usage by integrating intelligent controls for illumination and ventilation within an environment. The project leveraged advanced technologies, including motion sensors, temperature sensors, and RFID sensors, to facilitate the seamless and automated adjustment of lighting and ventilation systems, thereby ensuring optimal energy conservation without compromising user comfort and safety.

Features:

- Motion Sensor-Based Illumination Control: Integrated motion sensors to detect human presence within the environment, enabling automatic adjustment of lighting levels based on occupancy patterns, thereby minimizing unnecessary energy consumption during periods of inactivity.
- Temperature Sensor-Enabled Ventilation Regulation: Incorporated temperature sensors to monitor the ambient temperature within the environment, facilitating the adaptive control of ventilation systems to maintain optimal temperature levels while conserving electricity by adjusting airflow rates as per the specific environmental requirements.
- RFID Sensor-Triggered User Recognition: Utilized RFID sensors to identify and recognize authorized users within the controlled environment, enabling personalized settings for lighting and ventilation preferences based on individual user profiles, ensuring tailored comfort and energy efficiency.
- Intelligent Control Algorithms: Implemented intelligent control algorithms to analyze data from the sensors in real-time, enabling dynamic adjustments of illumination and ventilation parameters, thereby ensuring a balance between energy conservation and user satisfaction.
- Data Logging and Analysis: Incorporated a data logging and analysis system to collect and analyze environmental data, including occupancy patterns, temperature variations, and user preferences, facilitating the generation of comprehensive reports and insights for optimizing energy consumption strategies and further system enhancements.
- Remote Monitoring and Control Interface: Developed a user-friendly interface for remote monitoring and control, enabling users to access and manage the lighting and ventilation systems from a centralized platform, thereby promoting user convenience and providing an intuitive means for energy-efficient environment management.

Outcome:

The successful implementation of the Integrated Controlled Environment project resulted in significant energy savings and enhanced user comfort, highlighting the potential of intelligent sensor-based controls in promoting sustainable energy practices and fostering a more environmentally friendly approach to facility management and operations. The project's emphasis on personalized user experiences and data-driven optimization strategies underscored its role in promoting energy conservation and sustainability within various built environments.