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(57) Abstract :
The Maximum Demand Controller (MDC) system is a sophisticated solution crafted to effectively monitor, manage, and optimize electrical power consumption in industrial and commercial facilities. This cutting-edge system utilizes real-time data acquisition, advanced data processing, and strategic load management, ensuring that power usage is both controlled and efficient. The MDC system comprises various components, including sensors, data acquisition modules, microcontrollers, communication interfaces, user interfaces, control relays, power supply units, memory storage, protective devices, and intricate software algorithms, all working harmoniously for seamless operation and power management. In addition to optimizing power consumption, the MDC system facilitates the integration of renewable energy sources, thus enhancing the facility's sustainability. It includes robust cyber security measures to guard against potential threats and is scalable for larger and more complex installations. The system's real-time monitoring capabilities allow for proactive identification and resolution of power-related issues, while advanced data analytics provide critical insights for predictive maintenance and demand forecasting. By achieving efficient power management, reducing energy costs, and ensuring regulatory compliance, the MDC system stands as an essential tool for modern facilities striving for enhanced efficiency and sustainability.

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