



智能生產能耗數據管理系統

The Intelligent Energy and Utility Management System (IEUMS)

一個綜合無線通信、智能計算和自動控制技術的計算機管理系統

The integration of wireless communications technology, intelligent computing, and automatic control computer management system

專利申請編號及國家：201210003389.6 (中國)

特色與優點

- 工業級的無線傳送方案—嵌入式無線數據獲取器，適用於溫、潮濕的廠房環境
- 安裝靈活—不同牌子、內外置數字或非數字式的儀表均可用，毋須重新安裝
- 節省時間—提供高度準確、實時的能耗數據并可減少人手輸入所消耗的時間
- 智能運算—提供智能生產能耗分配，反映不同層次的能源耗用狀況，建立指標
- 實時系統—顯示能耗及生產狀況信息，配合可視化用戶介面，提供具追索性及預警性的車間管理工具
- 靈活系統導向—適用於不同類型的印、染業務

應用

紡織行業是高耗能的產業，能源成本在紡織生產處理過程總成本中，佔有最高的比例。生產能耗數據管理系統的建立，可幫助企業更全面深入地瞭解自身的能源耗用狀況，分類至每一個車間、每一台機、甚至每一單、色、布類等。建立不同層次的能耗指標，得出更為仔細的節能目標及成本分析，一步步的改善能源效益，以符合世界及國家十二五規劃的對綠色生產提出的主旋律，為環保出一分力

Patent Application No: 201210003389.6 (PRC)

Special Features and Advantages

- Industrial-grade wireless transmission solutions - Embedded wireless data acquisition devices are suitable for high temperature and a moist industrial environment
- Flexible installation - This system can adapt to different brand meters, including external or internal, as well as digital or non-digital meters, and can be applied without re-installation
- Time saving - This system can provide highly accurate, real-time energy consumption data and reduce manual operation
- Intelligent computing - The system can provide intelligent energy consumption and production allocation that would reflect the different levels of energy consumption situation and help establish indicators
- Real-time system - The system can provide real time energy consumption and production status information with the visual user interface. It provides traceability and exception alerts functions for the users
- Flexible system - The system is oriented for different types of textile printing and dyeing businesses

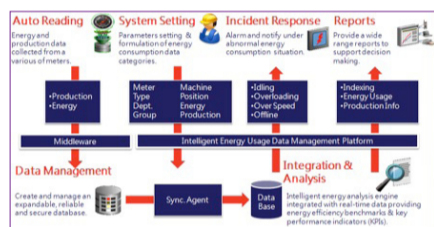
Application

The textile industry is energy-intensive. Energy cost occupies the highest proportion of the total cost of the textile production process. The establishment of energy consumption and production data management systems can help enterprises better understand their energy consumption status for each workshop, machine, colour, fabric, and even of each order. Establishing different levels of energy consumption indicators is effective in setting up a more detailed energy-saving target and cost analysis. Stepwise processes can be used to improve energy efficiency and to achieve the main theme of green production required by China's 12 Five-Year Plan as well as the global standards for the protection of the environment

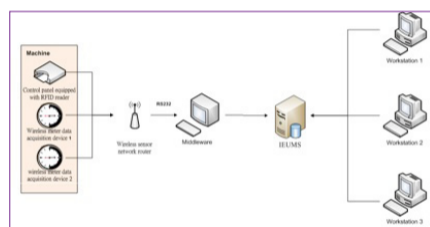
理工大學研發的“智能生產能耗數據管理系統 (IEUMS)”目的是為了提高監察能源消耗的効率。實時獲取能源的使用數據 (如蒸氣、水、電等)，以便對能源消耗及生產狀況加以分析，達至：

- 有效控制能源消耗並實現節能環保，降低成本及改進工藝技術等目的。
- 滿足跨國服裝採購商採購條件等要求。

系統採用Server (服務器) 和Client (客戶機) 模式，並配合ZigBee無線傳感網絡、無線儀表及生產數據獲取技術所組成。IEUMS系統的設計和設置遵循實用性、可擴展性、專業性、和經濟性的原則，並以此建立一個集中監控生產進程及能源使用的管理中心。根據實時獲取能源的使用數據 (如蒸氣、水、電等)，配合生產狀況數據，便對能源消耗及生產狀況加以全面分析。透過落實生產能耗定量及工藝操作的管理，及合宜的生產調度、考核評核機制和能源改善工程，提高能源使用效率，實現綠色節約化的生產。



1) 智能生產能耗數據管理系統的結構框架圖
Architectural framework of an Intelligent Energy and Utility Management System



2) 系統組成圖
System Constitution Diagram



3) 系統用戶界面圖
System User Interface



The Intelligent Energy and Utility Management System (IEUMS) developed by The Hong Kong Polytechnic University aims to improve the efficiency in monitoring energy consumption, to obtain real-time data of energy usage (such as stream flow, water, electricity, and so on), and to facilitate the analyses on energy consumption and production status. These goals are set to

- effectively control energy consumption and achieve energy conservation, cost reduction, technology improvement, and environmental protection;
- meet the purchase conditions of multinational apparel buyers.

The system comprises a server, a client, ZigBee wireless sensor networks, wireless instrumentation, and production data acquisition technology. The IEUMS is designed and configured under the principles of usability, scalability, professionalism, and cost-effectiveness. It is designed to establish a centralized production process and an energy usage management monitoring centre. By enabling real-time access to energy usage data (such as steam, water, electricity, and so on) and production status, the system facilitates a comprehensive analysis of energy consumption and production conditions. Through the implementation of quantitative energy consumption control, technical production operation management, and appropriate production scheduling, the evaluation assessment mechanism and energy improvement projects can improve energy efficiency and achieve green production.

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