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Abstract

AUTOMATED METER READING SYSTEM

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The idea of Automated Meter Reading (AMR) system is to provide a technology to collect the consumption data remotely and automatically in order to reduce human resources and mistakes. AMR system is a part of intelligent buildings. This study focuses on developing a practical application for existing buildings in order to improve our living.

This study is concentrated to design and implement an overall Automated Meter Reading System (AMR) - "Umac AMR System" as an application of AMR system. "Umac AMR System" is a practical and constructive centralized AMR application which is dedicated in the dormitories of the University of Macau for collecting the power consumption data of all air-conditioning remotely and automatically. "Umac AMR System" was involved not only both hardware and software design but also firmware design to build up the entire system. Programming used in the development of "Umac AMR System" was also consisted of various development tools from relational database programming to micro-controller drive programming. "Umac AMR System" can be claimed as the first AMR system in Macau.

A special technical pulse converter, which invention had been granted the Chinese patent with patent number ZL 982040873, was applied in the "Umac AMR System" to convert the revolutions of a traditional single-phase kilowatt-hour meter to ranges of pulses. Therefore, no extra reconstruction is required to the traditional single-phase kilowatt-hour meters in the existing buildings or apartments. For the

existing buildings, replacing all existing traditional power energy electric meters to new advanced digital electric meters is impractical and unrealistic. "Umac AMR System" is suitable for the existing buildings or apartments.

The "Umac AMR System" was implemented to manage two blocks of buildings used as dormitories for the University of Macau. There are 21 and 17 apartments with 42 and 34 meters installed for air-conditioning respectively. Power consumption data for air-conditioning can be collected from the central office remotely via the Public Switched Telecomm Network (PSTN). According to the experimental data, the error between the meter readings from central office and the meter readings on site is under one electricity unit and the error is not accumulate, therefore "Umac AMR System" is a practical application for intelligent buildings. The author hopes that the study can be expanded and applied to the other existing buildings for improving our living in China.