

先進讀表基礎建設最後一哩路連結用戶側增值應用整合技術發展

執行單位

國立高雄應用科技大學

計畫主持人

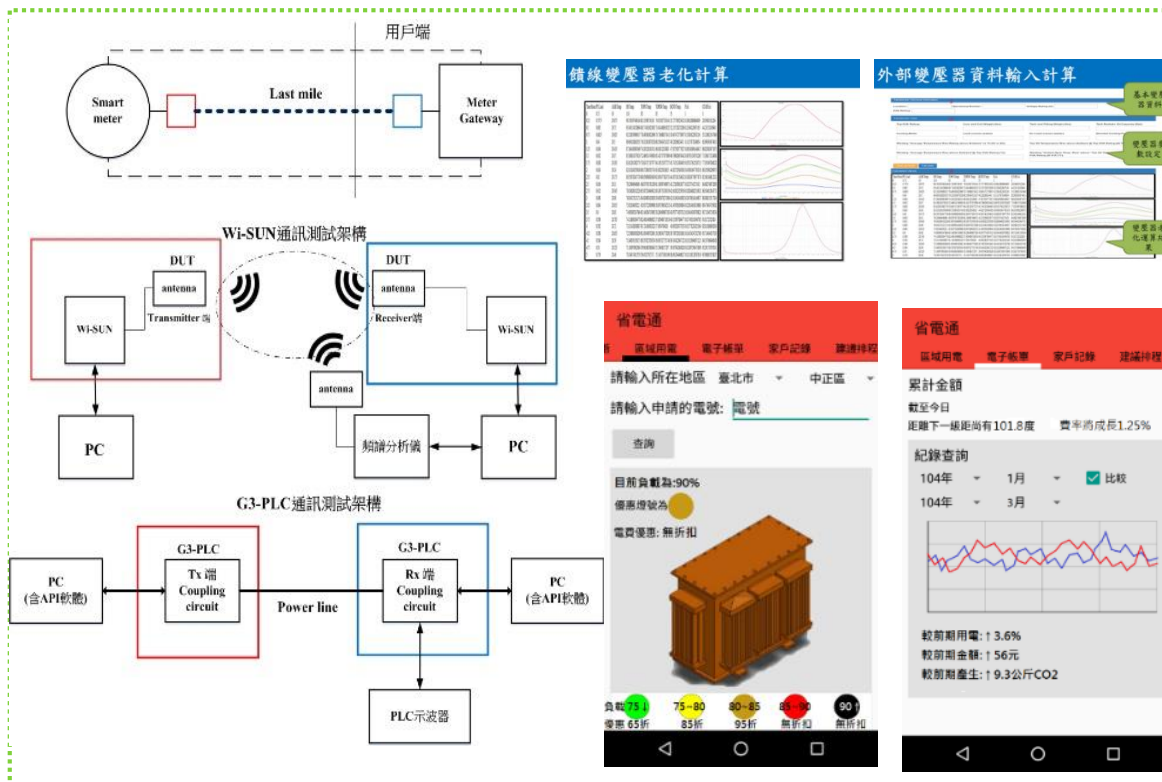
卓明遠

- 本計畫根據AMI既設系統至用戶端的最後一哩線路，結合電力、通訊、網路、資訊技術，建構電力通訊網路、能源雲、配電變壓器增值服務與資訊網路安全機制的最後一哩線路介面、測試平台，落實擴展電力公司增值應用服務範疇。

卓明遠、林士允、陳建男、張春龍，「智能斷路器」專利於民國105年12月送審申請中。

卓明遠、林士允、陳建男、張春龍，「電源斷路器」專利於民國106年11月送審申請中。

蘇俊連、卓明遠，「供電網絡中變壓器超載運轉或故障之檢測系統」，中華民國發明專利申請中。申請案號105140610，105年12月8日(申請日)。



● 技術介紹

打造具能源伺服器與智慧斷路器的智慧配電盤。在電表端與住戶家中的智慧配電盤之間，建立穩定、可靠的通訊架構。並考量到智慧電表的運算能力無法支撐高位元的加密演算法，因而開發低運算負擔的對稱式加密系統。開發用戶使用效能指標與能源雲專業服務軟體。開發配電變壓器壽命評估分析程式，作為加值服務。

● 目前發展情形

與工研院「智慧電表與用戶端整合之1000戶示範計畫」配合執行，針對部分場域的透天公寓與大樓，進行Route B 通訊媒介的測試與驗證。智慧配電盤與其重點設備「智慧斷路器」與「能源伺服器」已完成。改善Route B有線與無線網路的建立建立機制，使其更有效率。對於台電給予的智慧電表規範進行弱點分析與改善，且加密演算法已建立。能源雲專業服務軟體已完成。配電變壓器壽命評估分析程式已完成。

Integrated Technology Development of Customer Side Value Added Applications Connected with Last Mile for Advance Metering Infrastructure

Execution Unit

National Kaohsiung University of Applied Sciences

Project Director

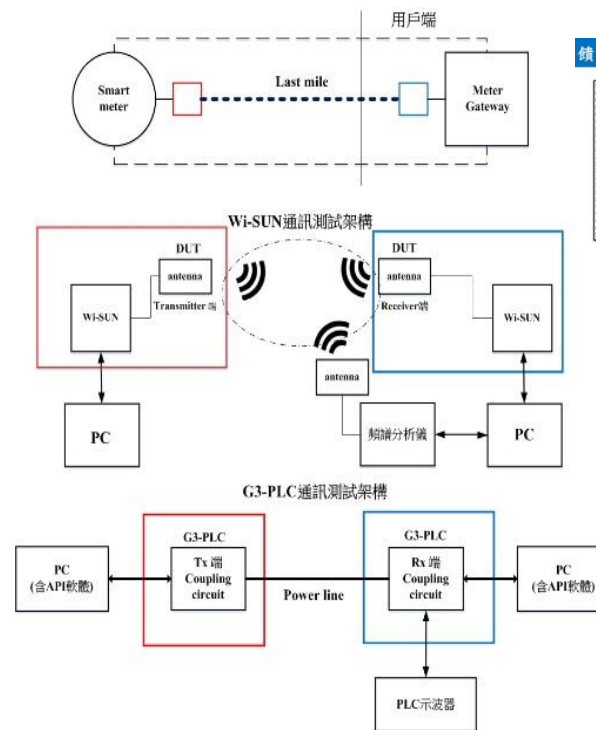
Ming-Yuan Cho

This project combines the technologies of power, communication, network and information to develop a last mile interface and testing platform which includes five frameworks of communication line testing and evaluation, integration of power, network and communication and smart procedure of panel, energy cloud, value added service of distribution transformer performance enhancement, and information network security mechanism in order to propose models of network communication testing evaluation and smart operation and finally to realize the utility's scope of value added service between AMI meter to customer side.

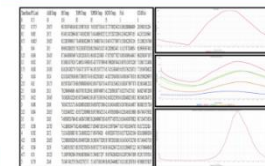
The patent , "Smart Circuit Breaker", has been under processing.

The patent , "Power supply Circuit Breaker", has been under processing.

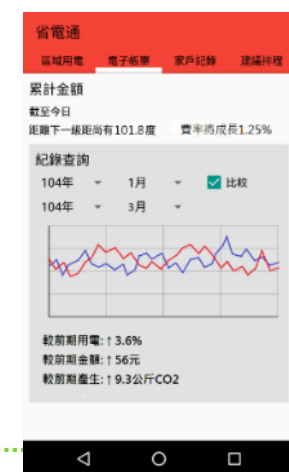
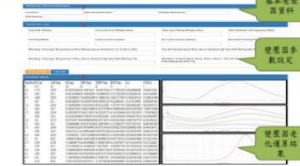
The patent , " A Detection System for Distribution Transformers Overloading or Fault", has been under processing, application number: 105140610.



饋線變壓器老化計算



外部變壓器資料輸入計算



Sub-project I has developed wormhole chain-link network algorithm, which can improve AMI last mile network speed and reduce the chance of collision when transmitting packets, and then effectively improving the communication reliability.

Subproject II has developed a smart panel that serves as a central management hub for HEMS and can interface with smart meters and record energy usage at home and two-way communicate with end devices (smart plugs) to execute demand response programs.

Sub-project III has developed a system that can use AMI data for transformer performance analysis and life assessment to expand the range of value-added application services.

Sub-project IV proposed a lite version of the encryption algorithm, the future can help smart meters to strengthen the security of information transactions.

Sub-plan V plans to build an energy cloud to collect customer's energy consumption data through smart panel, and to conduct online big data analysis and evaluate HEUEI (Home Energy Usage Efficiency Index).