

Energy Monitoring Wireless Networked System (EMWiNS)



Project Acronym: EMWiNS
Project Details: Energy Monitoring Wireless Networked System (EMWiNS)
Start Date: April 2012
Duration: 20 Months
End Date: November 2013



CIT Cork School of Music

Project Description

The project team aimed to develop a tool to enable embedded monitoring and fault isolation allowing automated continuous commissioning of heating, ventilation and air conditioning (HVAC) systems. The project has developed:

1. A diagnostics system delivering fault isolation for continuous-valued inputs from building systems data.
2. Simulation of Fault Detection and Diagnostics “what if” scenarios using the extended system to isolate faults in the wireless network and building components.
3. Wireless sensor/actuator network design, deployment and network-monitoring tool.
4. Parameter-updating of wireless network and diagnostic algorithms using live building performance data to maintain the building energy consumption at design-intent levels.
5. Reduced order HVAC models that enable easier fault detection.

Project Achievements and Impacts

The project team has developed and successfully demonstrated a prototype tool with the following capabilities:

1. A wireless networked system for HVAC monitoring that can report faults for the HVAC system components and wireless network.
2. Demonstration of how a HVAC system can be described in a reduced order model making it feasible to embed into a wireless infrastructure for building automation systems.

During the demonstration, the power of the diagnostic system was illustrated when several problems were identified the HVAC system. When these issues were corrected, energy consumption was reduced by an estimated 15%. Finally the demonstrator remains in place and data is being gathered and archived. This is a useful resource for the IERC member companies and for future research work led by the IERC.

Participating Research Organisations

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 Civil Engineering, National University of Ireland Galway
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