Swansea Metropolitan University Building Management System

The university commissioned a new energy saving system which combined a Target and Monitoring (T&M) and a Building Management System (BMS) which needed to be custom built to specific requirements.



Market: Power & Energy
Location: Uk
Customer: Swansea Metropolitan University
Technology Partner: Bubble Automation

Project Introduction

Swansea Metropolitan University (SMU) based in South Wales (UK), has been a major centre for the delivery of vocational higher education since 1853. The University employs more than 500 staff and teaches more than 6,000 students. The Welsh Assembly (Welsh government) sets energy targets for large organizations to achieve and by doing so they receive some form of rebates or benefits. So recently the university commissioned a new energy saving system which combined a Target and Monitoring (T&M) and a Building Management System (BMS) which needed to be custom built to specific requirements. This was implemented by Highland Services, as well as the University M&E maintenance company with SCADA software provided by Bubble Automation.

System Requirements

The final installed system needed to be superior to the existing heating and BMS system which was unreliable, inefficient and offered little or no support from the vendor. The brief was to create an active energy management system to monitor and improve power distribution management across a large number of buildings, to guarantee efficient energy usage. The solution needed the ability to monitor both power consumption and the behavior of the controlling devices at each building in real-time, as well as adjust power consumption according to its needs, and improve its efficiency. In addition, the customer required a benchmark system to compare the specific energy consumption for similar buildings. Therefore, the solution needed to meet these requirements:

- **Prime cost**
  ? As a combined system the supply and installation costs were far lower than would otherwise be if two separate systems were installed ? incurring additional cost.
- **Ownership**
  ? Ownership of the software resides with the University with no restrictions on development, license fees or access restrictions. The system was developed using commercially available market leading programming software, coupled with high quality PLC components.

As owners of the system, the university is able to make alterations or maintenance carried out by whoever is the most cost effective service provider, with the option of making in-house modifications themselves.

- **Running cost**
  ? The new system provides all the information required, and produces customizable reports for presenting to anyone who needs it ? without external involvement and therefore without cost.
- **Information**
  ? The system not only shows what their energy usage is, but it also shows them where they are using it and why, thus providing comprehensive control over energy consumption. The university also has the ability to alter their system of control and monitoring; changes that can be made, as often as required and whenever they are required, without having to pay someone else to do it.
- **Relevance**
  ? The system is uniquely designed around the University´s specific requirements with nothing pre-configured. Therefore they won´t need to alter or adapt it which reduces total cost of ownership.
- **Simplicity**
  ? The system is designed around the University´s needs and as such is designed to provide all the information and control, the way they need it.
- **Adaptability**
  ? Whatever level of monitoring and control is required, the system can incorporate it, i.e. HVAC, lighting, occupancy control, access control,etc.

Project Implementation

After lengthy discussions with SMU it was felt there was a need for something different. In partnership with Highland Services and automation software developers Bubble Automation Ltd., they created a system that benefits the university without holding them to ransom. They developed a new approach to monitoring energy consumption and controlling the major items of plant that use it.

ADAM-5550KW Programmable Automation Controllers with I/O cards, and ADAM-4015 Analog I/O Modules with temperature sensors were chosen for the control tasks which required Industrial PC computing performance with the robustness of a PLC. The goal for SMU was to have a cost-effective and energy efficient BMS.

Combining ADAM-4015 and ADAM-5550KW enabled them to meet their efficiency targets and provide a more accurate, efficient, and reliable system for the whole university.

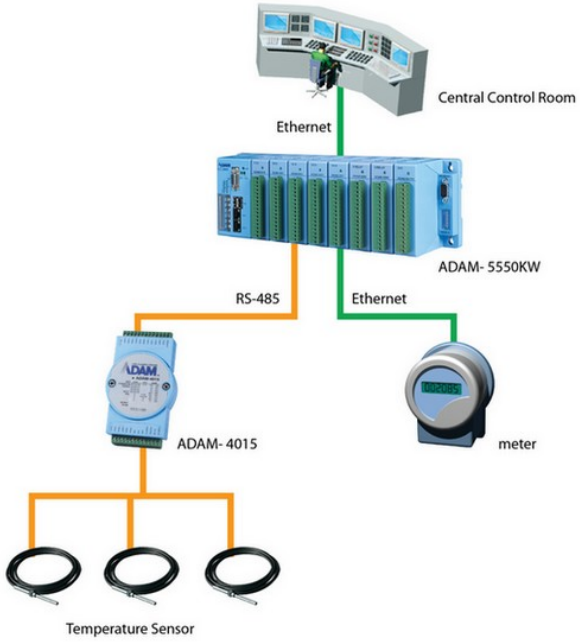
Highland Services have been in business for more than 40 years and take great pride in establishing long term working relationships with their clients. Realizing that the University was not getting what it needed from their existing T&M system nor their BMS, Highland Services proposed a radical solution ? to replace the old restricted systems with an all new bespoke system designed around their needs. To do this required the services of a company with a very similar business philosophy and were pleased to find that in Bubble Automation, who are an established automation software developer. Together HighlandServices and Bubble Automation installed everything which means they really understood the overall system and equipment.

Andrew Smith, a software engineer from Bubble Automation said, "We pride ourselves in building long term relationships with our customers and although our systems do not need our direct involvement, in the future we still hope that our customers will want to use us for periodic maintenance and service. We can provide 24-hour support 365 days per year and can even diagnose/rectify/adapt systems remotely, and using Advantech´s ADAM products meant that we could be sure the University was getting the best deal."

?It has taken a lot of effort from all involved, not least our client - the University, but we are at last able to offer what we consider is a reliable system, which is a credible alternative to what has been available in the past? commented Clive Granville of Highland Services. ?With Advantech, we at Highland ServicesandBubble Automation have achieved their aim of providing a system that offers to meet the client?s needs without tying them to any one supplier. We believe that it will be our ongoing dedication to the client?s requirements which will allow us to continue and grow our business.

ADAM-5550KW	Programmable Automation Controllers with I/O cards
ADAM-4015	6-ch RTD Module with Modbus

System Diagram



Benefits

The solution has the ability to monitor both power consumption and behaviour of the controlling devices in real-time. The solution adjusts its power consumption according to its needs, and therefore improves its overallefficiency. Total cost of ownership is low because:

- the commercially available software resides with the University with no restrictions on development, license fees or access restrictions
- the hardware architecture was developed using high quality, off-the-shelf PLC components
- the entire system provides and produces customizable reports for ANYONE who needs it
- the entire system is future-proof. Whatever level of monitoring and control is eventually required, the system can incorporate it, i.e. HVAC, lighting, occupancy control, access control, etc.