



Case study

Energy efficiency and
integrated management in the
education sector

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Managing all the various pieces of equipment in a multi-purpose teaching centre in an integrated way can be a complex task and a considerable technological challenge.

In buildings this large, you very often come up against a wide range of devices, and getting them to interact with one another can be difficult. Plus, the energy system might not be optimised to meet the needs of the various facilities inside the centre.

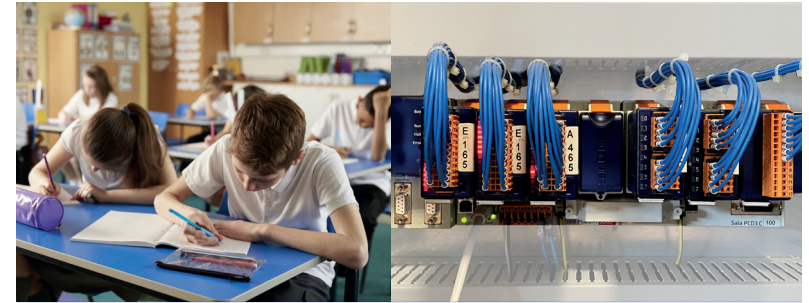
What is the best way to manage such a complex structure? This case study on a multi-purpose teaching centre in the Veneto region offers some interesting answers to this question.



The site covers an area of 25,000 square metres and can accommodate around 2,000 people every day. Although it comprises several buildings with a range of uses, its primary purpose is to provide education and teaching services.

Work done by the system integrator Casella and the use of Honeywell technology have enabled the various structures to be managed in an integrated way, while the use of advanced management systems has reduced energy consumption by 30 per cent.

Achieving energy efficiency in the education sector



The success story presented here shines the spotlight on the education and teaching sector; an industry that requires close attention to be paid to energy efficiency as well as the safety and hygiene of places where matter such as indoor air quality are important.

The multi-purpose teaching centre has undergone major redevelopment and now comprises a vocational college, a technical institute, a university building with student halls, a building housing the administrative offices and a care home. In terms of its energy supply, the site was built with an electricity substation and a photovoltaic system and uses methane gas.

Although most of the problems caused by the complexity of the structure were down to the sheer size of the buildings spread across the 25,000 square metres, the range of different facilities inside them also presented a few challenges. At plant level, meanwhile, the critical issues were due to the equipment and how outdated it was. While in terms of technology, the challenges came from the patchwork of devices involved and the lack of both a common connection network and a common management and control system.



The role of the system integrator Casella

Casella's help was required in order to streamline and connect the various facilities and pieces of equipment with a view to boosting energy efficiency and optimising management and control.

The project for integrating and retrofitting all the equipment led the company to opt for the technical solutions provided by Honeywell. Mirco Casella, Technical Manager at the system integration firm, which has been active in the civil and industrial plant engineering sector for 43 years, comments:



“With Honeywell’s technology, you’re guaranteed solutions that will be capable of implementing different protocols.

It also allows you to have onboard web servers, enabling the customer to access the features of their equipment remotely without needing any monitoring software.”

According to Mr Casella, the element responsible for centralised monitoring is currently being studied to see if the whole system can be integrated:

“The flexibility and high-tech innovation offered by the Honeywell solutions convinced us to choose them in this case to implement and coordinate a structure like the one here.”

Choosing control solutions from SBC – Saia Burgess Controls

The project envisaged splitting the centre’s various facilities into three parts.

In the first part, covering zones 1, 2 and 3 (comprising the entrance to the institute, the main hall, the chapel and the boilers; the kitchen, canteen and student halls; the gym and classrooms), a web-server-based monitoring system was set up with pages loaded onto a controller in control centre 1 and with an exclusive control logic for the equipment connected up in a local operating network (LON).



In the second part, covering zones 4 and 5 (ground- and first-floor classrooms, games room and study rooms and laboratories for mechanics, graphic design and mechatronics), monitoring is likewise based on a web server, with only the equipment connected up in a Modbus RTU network being controlled. In the third part, the zones involved – 6, 7 and 8 (comprising the directors’ offices, some rooms of the student halls, classrooms, other offices and the care home) – rely on equipment connected up in accordance with the KNX building automation standard.



For the specific integrated management project, the system integrator Casella – an SBC-registered partner – chose solutions from the range offered by **Saia Burgess Controls** (a subsidiary of Honeywell HBT and a brand specialising in energy management systems), particularly its Saia PCD controllers and Saia PCD Supervisor monitoring system. The Saia PCD Supervisor is a scalable software platform that monitors and manages simple HVAC controls and control stations for large building complexes or infrastructure installations.

Open communication standards allow third-party systems to be integrated. The user-friendliness of the Saia PCD devices ensures efficient system management as well as extremely convenient operation thanks to their customisable user interface, dedicated dashboards and remote control functionality.

This integration logic gives plant operators the option of controlling the status of their machinery at any time, making all adjustments intuitively and in real time. What's more, they are warned of potential malfunctions in good time and can therefore solve any problems promptly, without interrupting operations.

Management and monitoring for more energy efficiency

The initial situation with regard to the energy management of the equipment involved a transformer substation with switchboard for all the buildings, the gas supply system and solar panels delivering 80 kWp.

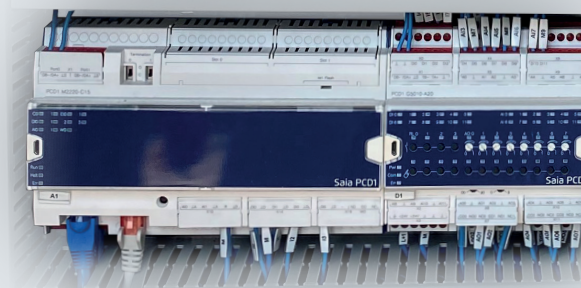


This particular project involved monitoring consumption and the thermal and electrical performance of the systems, which enabled consumption to be cut by some 30 per cent.

Products used

E-Line controller

The freely programmable modules from the Saia PCD1.E-Line series are microcontrollers for specific room automation, zone control or decentralised automation tasks.



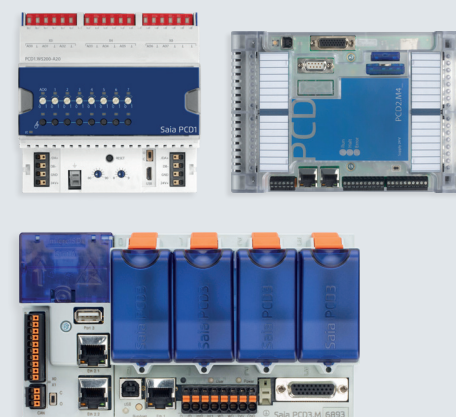
Saia PCD1 – PCD2 – PCD3 controllers

With our flexible and modular Saia PCD controllers, we provide you with ultra-sophisticated core technology for automating your projects.

The application software for a project is portable throughout the entire lifecycle of the devices regardless of their class or generation.

To protect programs over time and save operating data, the devices can be kitted out with expandable memory, and this data can be made available via the automation server.

Our controllers are aligned with international standards in order to achieve the highest possible degree of energy efficiency, cost reduction and convenience for the user.



PCD7D412 display screen

Our programmable operator panels are particularly suitable for operating and visualising automation environments equipped with local intelligence.

This removes the need for a controller. Integrating the use of decentralised RIO stations also minimises the amount that needs to be spent on local cabling.



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