

Case note

Centralised plant supervision and real-time energy consumption monitoring

A complete building management solution



Project location and overview

ABB worldwide centre of excellence for the manufacture of low-voltage modular Residual Current Devices (RCDs), located in Santa Palomba (Rome, Italy). Complete integration of building automation, surveillance and security functions. Real-time supervision of all functions and power consumption for the whole site via PC.

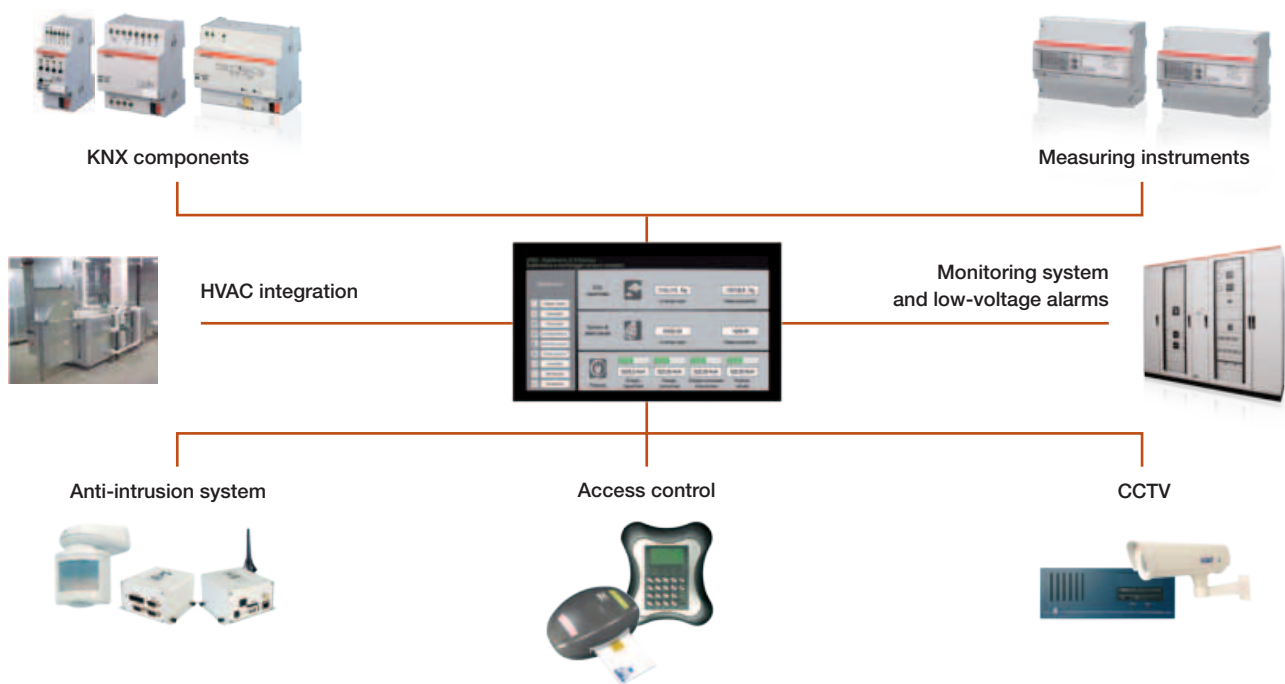


Description of the work

The aim of the work was to create a complete supervision and monitoring system for the plant and its sections, in order to measure consumption in real time and quantify the benefits of the energy saving optimisations already made to the plant (installation of ABB inverters in the production units vacuum systems and in the air-conditioning ventilation system).

The system was created in multiple stages:

- Installation of meters applied to: office and production line busbars, ATU (Air Treatment Unit) room, air conditioners, compressors and air-extraction systems, external lighting systems.
- Installation of interfaces to gather all data acquired.
- Creation of a real-time system to measure energy consumptions data, grouped by area-modules and time frames.
- Creation of a database, with analysis and comparative statistics between present and historic energy consumption figures.
- Display of energy savings in terms of kWh, Euros and tonnes of CO₂, expressed as an equivalent number of cars taken off the roads and/or trees planted.



Systems controlled and managed through KNX

Together with the Systems Integrator SAET, ABB has completely integrated safety & security and building automation using the KNX standard, ensuring:

- centralised plant supervision, integrated in the building's external security system, including measurement and alarm/control functions.
- management of lighting with ABB i-bus® KNX devices.

The energy monitoring system sends all consumption data (energy and power, in various forms) to the central monitoring system. These are acquired at the various measurement points in the plant connected to the KNX bus for real time control, analysis and comparison with historic data. This allows energy savings compared to the past to be clearly displayed, expressed not only in kWh, but also in CO₂ kg and therefore evaluation of whether corrective actions are necessary.

The KNX bus, active across the whole plant, makes it possible to manage and control all systems: lighting, monitoring, air conditioning, compressors, air-extraction for soldering processes and access control using badges and anti-intrusion alarms. In this way, all systems are incorporated into one centralised system, improving personal and work life and having a positive effect on energy consumption.

Benefits obtained: energy savings and awareness

The installation of ABB inverters on the motors of the two air-extraction units has decreased annual power consumption from 110,000 kWh to 31,000 kWh.

In the air conditioning ventilation system, the introduction of an inverter reduced annual power consumption by approximately 30%: from 46,000 kWh to around 33,000 kWh.

These two interventions allowed annual electricity savings of almost 300,000 kWh (approximately 5% of total electricity consumption), and therefore a reduction of 147,000 kg of CO₂ emissions, equivalent to taking 50 cars off the roads or creating a 50,000 m² area of woodland.

The total time to see a return on investment is just one year and a half; the inverters in the air-extraction system will pay for themselves in only three months of operation.

Along with the substantial improvements in the efficiency of the systems and consequent reduction in power consumption and environmental impact, the project has also produced an educational effect in terms of energy savings. Indeed, a large screen has been installed in the entrance hall to display the most significant parameters relating to power consumption and, above all, the improvements made – the CO₂ emissions avoided, the real-time eco-sustainability indicator and the instantaneous power consumption compared with historic figures.

ABB SACE

A division of ABB S.p.A.

Wiring accessories, Home & Building automation

Viale dell'Industria 18

20010 Vittuone (MI) - Italy

Tel.: +39 02 9034 1

Fax: +39 02 9034 7609

www.abb.it/lowvoltage

www.abb.com

Power and productivity
for a better world™

