

## Case note

# ABB Building Automation for energy efficiency

## Lower power consumption and reduced environmental impact in the service industry



Accenture Headquarters received the ABB Energy Efficiency Award 2010

### Project description

The impressive project whereby Accenture Italia combined its two previous bases in the center of Milan in a single, specifically selected and totally renewed building was successfully completed in just ten months. From choice of the site to selection of all the technological installations, every part of the project conformed to the corporate culture when it came to efficiency, respect for the environment and cost containment. But it couldn't be otherwise for the local base of Accenture, a global enterprise whose core-business is management consulting, technological services and outsourcing, with offices in over 120 different countries and more than 204,000 professionals, over 9,500 of whom work in Italy. The building interiors were modified and all the electrical and heating systems were renewed to suit the most modern technologies: at the heart of everything, there is now an ABB building automation system that monitors and controls all the installations. Besides providing the very highest level of comfort for the people who work in the building, the result is 700,000 kWh less electric power consumption per year.

### Application context

The new headquarters is situated in via Quadrio and covers an area of 17,000 sq m of which 9,000 are built up. It comprises a perimeter building and a seven-storey central tower with a glazed façade. About 1,000 people work there. Accenture had a clear idea of the expected results, in line with the specific guidelines provided by the top management. As normally occurs in these cases, the main requirements included room planning able to make the best possible use of the available space, comfortable and convenient work environments, basic and advanced service facilities that would be simple to manage, absolutely reliable and able to keep the costs down; sustainability throughout. Updated Building Automation systems were the best answer for these requirements.

The restructuring work merely involved the building interior. The principal, GSP enterprise, Studio Progettazione Elettrica Mastrogiacomo and the ABB specialists collaborated in a close and profitable way throughout the job. The electric power installed amounted to an overall 115 kW. Considering that the offices are used for 250 days/year and for eight hours a day, the building is occupied for 2,000 hours per year on average.

## Technological solutions

The degree of luminosity is controlled by means of low luminance optic lamps that provide an indirect light. They are suitable for work with video terminals while being able to cut down on electricity consumption and ensuring that the conditions are more comfortable for the eyesight. Reactors with Dali technology, which can vary the light intensity from 0 to 100%, and the sensors with which the lamps are equipped, allow the artificial light to be regulated and mixed with natural light, an important way to prevent waste in a building that is mostly made of glass.

Moreover, the sensors of this lighting system only turn on the lights when there are people in the room. All the lights and sensors are connected to the ABB i-Bus system based on the Konnex standard, with a single platform that integrates presence detectors and light intensity with the illumination level percentage command.

Thus the illumination level is kept at a constant level for each sector by the sensors, which regulate the flux issued by the lamps and reduce it, depending on the amount of natural light available. There are a total 948 2x49 W lamps with dimmers, 532 2x18 W lamps with dimmers, 24 Dali gateways of the ABB DG/S1.1 type, 60 ABB LR/S 4.16.1 luminosity sensors (each with four sensors in the field) and 277 ABB 6131 Presence Detector FM sensors.

Inverters were used to optimize the operation of the heating plant. High-efficiency boilers and a primary air system with heat recovery devices were installed. Controlled by the ABB i-Bus Konnex system, the temperature and humidity probes sited in various parts of the building provide separate microclimates to suit specific needs.

The ABB Building Automation system also provides integrated management of the evacuation, fire detection and alarm systems. Supervision, control and monitoring functions are implemented by means of an ABB-SAET Building Management System (BMS), which combines several systems featuring different structures and communication modes.



## Results obtained

Measurements taken during the months following the inauguration of the building have shown that, compared to the traditional sort of installations, the energy-effective lighting sources of the new system consume 50% less per year (300,000 kWh); optimized management with natural light can cut consumptions by 20% (70,000 kWh), while use of presence sensors reduces them by 10% (30,000 kWh). Lighting on a time-band basis and weekly/annual programs cuts consumptions by 5% (100,000 kWh), while heating and air conditioning management reduces them by 20% (200,000 kWh). As a whole, on an annual basis, the reduction in consumptions amounts to 18%, i.e. 700,00 kWh equivalent to 161 Tep. Moreover, the lighting is always at an optimum level and conforms to the values established in standard UNI 12464-1 for workplaces.

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