

A photograph of the Leonardo shopping center building, a large, modern structure with a prominent 'AUCHAN' sign in red on the right side. The building has a series of arched openings along its facade. In the foreground, there is a green lawn and some trees on the left. The sky is clear and blue.

The biggest shopping centre in Italy is all under complete control.

The new Leonardo shopping center is the biggest and most modern shopping centre in Italy where security and control is managed by the Movicon Supervision system.

The biggest shopping center in Italy celebrated its opening day in Rome in November 2005: "Centro Leonardo", Leonardo Park, Via Portuense, hitting the news headlines with these staggering figures: took 2 years to build, 100 thousand square meters on two floors, 210 shops, with 18 million shoppers expected a year. And not only: 133 kilometers of electric cables laid down for main structure only, 155 thousand meters for the shops; 540 million kilos of earth removed to make room for 300 million kilos of power sprayed concrete, 5900 meters of fluorescent lights in the "Auchan" hypermarket only, 19 million

kilos of iron rods for reinforced concrete, 200 thousand square meters of flooring slabs, 100 thousand square meters of wall. And still: 100 square meters of paving in the covered-in arcade, 20 thousand for suspended ceiling and 180 meters of paint, two thousand doors and fixtures, 80 thousand square meters for industrial paving, 4 thousand square meters only for wall tiling, 150 thousand of plastering and 5 thousand square meters of skylighting. "We are very proud to give the go ahead for this big construction" explains Edoardo Caltagirone, the youngest child of roman entrepreneur of the Leonardo Caltagirone

group who financed the project. A very ambitious project set in the Leonardo park scenario, the new satellite town with 10 thousand habitants where building is still going on, between Rome and the intercontinental Leonardo da Vinci di Fiumicino airport. The project was commissioned to a very prestigious British architect studio. Partly futuristic; favouring materials mainly of steel and glass, and partly historical inspired by the great Leonardo da Vinci, the designers have incorporated the flavor of the roman architecture of his time, especially the paving.

The maxi shopping centre can be found in the new Parco Leonardo, a residential building complex in near completion, with a multiscreen cinema, the “Ugc Ciné Cité” with 24 big screens, which celebrated its opening day last February. A new exit road leading to the shopping centre was added to the Roma-Fiumicino motorway (between the Rome Civitavecchia access ramp and the airport exit) and the Via Portuense, between the Ponte Galleria and Porto, has been widened to make way for the traffic increase (above all at weekends and festive seasons). This project to ease traffic, also financed by the Leonardo Caltagirone group for 27 million euro, included various solutions such as the new pedestrian precinct systems.

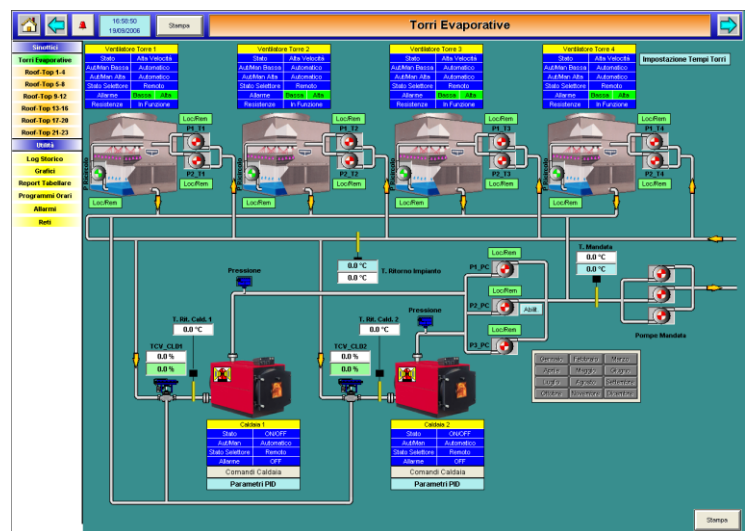
The technology

The Shopping Centre has been planned to house the most modern technology. The system’s automation and supervision were dealt by Automazione Sud Srl, one of the most qualified and experienced system integrators in this sector and also Movicon solution providers, the Scada platform designed and produced by Progea.

The two shopping centre entities, shops and hypermarket, have independent system engineering, each one controlled and supervised by 2 supervision PCs

based on Movicon Scada/HMI with connected subsystems.

The various subsystems are connected to each other through supervision workstations, which are link up through three distinct bus types: The heating control systems use a LON network, the air conditioning systems use a Modbus network and the illumination and distribution systems use a PLC on a Profibus network. Each subsystem, with control independence, is connected to the supervisor where information is brought together through field buses.



A Movicon screen displaying the Leonardo shopping Centre’s technological systems.

One side of the control which manages the Shop sector uses a LON network with the Siemens SBT PX control systems to regulate the heating and cooling system with 1 thermal power station and 4 evaporative cooling towers serving each of the 210 shops’ air treatment units. The cooling system and ATU connect to the 24 ClimaVeneta roof-top air conditioners on a Modbus network. The entire energy power and light distribution system is managed through 35 local electrical cabinets, connected on a Profibus network and managed by Siemens S7 PLCs, which provide arcade illumination, technological services and

waterwork and HVAC system management.

The control system has been designed focusing on how to save and manage energy. This has especially been applied to the thermal circuit where the



Inside the Rome Leonardo Shopping Centre.

temperature conditions in each single shop are monitored by a PID controller that makes sure the right temperatures are maintained. This method also applies to the light control system where the quantity of natural light and artificial light are monitored and controlled to get the right light intensity according to each environmental situation in order to save energy. The Rooftop units have been interfaced with the system through a serial bus, ensuring their complete enslavement to the control system so that the right thermal energy, in each of the various areas containing these rooftops, is maintained according to the set points preset based on which day, time of day considering the busiest shopping hours with the biggest crowds.

All the data relating to the electric power distribution and consumptions are gathered by the supervisor and historically logged enabling the analytical network tools to diagnose and execute precision analysis to optimize electric

power consumptions based both on the time of day and shopping crowds.

The whole distribution system is managed on location by 37 CPUs with input/output distribution on a fieldbus. Similar to the shopping center, and with complete autonomy, a system has been engineered for Auchan hypermarket with the same characteristics, regarding the monitor and control systems and supervision units. System engineering wise, the hypermarket uses a thermoregulation system with its own central heating, a cooling system with central cooling with three groups of coolers and 10 rooftop air conditioners, an electric and light distribution system, and a HVAC (air treatment unit) system.

The Movicon Supervision

The supervision system, an open Scada platform, has allowed the system engineers to centralize all subsystem information even though deriving from various bus system types with different technologies.

This information is then distributed to the other Supervision Client Stations, located over the information system's Ethernet network. This allows users to interact from different locations, and with different access privileges. Daytime access is reserved for System managers while the client station is dislocated at nighttime so that access is granted to night watch users only. Different types of access have different command privilege limits with a very transparent and complete alarm management and easy to follow indications on carrying out resets autonomously.

Mr. Fortunato Di Masi
Automazione Sud Srl