



## Doimo Cityline New Production Facility Furnished with Energy Saving Building Automation

**F**ounded in 1991, Doimo Cityline is a leading Italian company in the furniture industry. With almost 30 years experience in the field, Doimo Cityline is very well positioned in the Italian market and offers more than six different product brands within the home, office, and contract segments. In order to fulfill high production requirements Doimo Cityline decided to open a new production facility. The building covers an area of 35,000 square meters (114,900 square feet) and is equipped with the most sophisticated logistic production systems. Highly developed technology supplied by German and Italian manufacturers is implemented in all departments.

When Doimo Cityline contacted E.C. Engineering, the company was looking for a building automation solution which would enable the integration of HVAC, lighting, emergency lighting, sun blinds control, alarm system and gates and access control, into a single building management system (BMS).

**The Challenge:** E.C. Engineering needed to plan a solution in cooperation with JS Building Automation for the realization of the LONWORKS® network and the integration of all the devices.

Since the production building is divided into two areas: one dedicated to production and one to administration, it was necessary to create a micro-temperature control system, so that each room could be set to the best comfort level, while also optimizing energy savings. The lighting system needed dimmer-functionality to take advantage of natural daylight and room occupancy-based shutdown, with the possibility to override the automation with easily accessible wall-mounted switches.

Also worthy of mention are the access management and the entrance/ exit monitoring using a system that allows different levels of access arrangements depending on the presence of an operator or a scheduled program.

**The Solution:** In order to meet the multiple needs of automation and integration, JS Building Automation chose to use its supervision system "NEXT" that enables the customer to have a single user interface to control all building systems.

A LONWORKS network was built with a primary backbone that is part of a monitoring server, and connects the backbone by the use of routers capable of branching into 20 channels using star, bus, ring and mixed topology. Devices equipped with FTT (Free Topology Twisted Pair) and PLT (Power Line) transceivers were installed in the network, suitably divided into different physical channels.

In addition to the central system, an embedded PC that contains the embedded logic for access management, was connected to the network. This PC can be used as a freely programmable LONWORKS platform "super node".

To manage the lighting of offices, they have been equipped with a total of 107 dual-tech sensors that work as



occupancy and brightness sensors at the same time. By means of the management system it is also possible to set the threshold luminance of a sensor relative to an office – usually the sensor is positioned in the poorer lit areas of the room. This acts as a master for the other sensors ensuring lighting comfort for all users. The sensors also switch off the lighting when no movement is detected in the office. This, together with the threshold brightness, contributes significantly to saving energy in the building. It is also possible to override the lighting system using the wall switches, which enable turning on/off the lights and also manually adjusting the brightness level. In the spaces between the glass walls, touch screen switches, produced by Doimo, have been installed and interfaced to the LONWORKS network via the MTG device that acts as connector to the MLRI module.

The entire system also allows management of different lighting scenarios for the building façade and scenic outdoor lighting. These scenarios are administered in accordance with external light sensors to maintain the building's illumination.

The controls in the production area are divided into functional areas with the ability to control illumination and the opening and closure of skylights and windows. These features are also automated via a connection to both a rain and a light sensor.

Another key point of the system is the development of access management. 34 iButton readers have been installed and interfaced to the LONWORKS network via a JS MLRI device. The "NEXT" system provides the ability to create working groups which are assigned to users in different functional groups. The users are authorized to use the iButton keys, to pass through various access points based on their clearance level. The system also provides the ability to disable access based on scheduling. Doimo Cityline was thus able to assign 17 points of access to different working groups which were defined based on operational functionality.

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The additional features of gate and barrier management allow the operator to deal with vehicle flow. It is also possible to assign a predefined mode in order that the gate always remains open. The bar is managed by the operator during the access phase and on the way out it is automatically managed by a magnetic coil. When the gate status is not on predefined mode the operators themselves can run individual commands to open and shut the bar or run the command "single pass". In this case the gate and the bar will remain open for 60 seconds, when the photocell has detected the passage of the car. After five seconds the bar closes automatically.

In order to manage and control the HVAC system, three UTA machines, several fan coils, the boiler and the refrigeration unit have been interfaced to the "NEXT" system. "The NEXT" system is interfaced via a LONWORKS protocol to the Kieback&Peter DDC4000 automation station that, thanks to clear and intuitive graphics of the plants, enables the user to manage and control the entire HVAC system.

The offices are equipped with radiant ceiling panels integrated into the "NEXT" supervisor via Modbus. It is therefore possible to adjust temperature setting and mode of operation and also to receive alarm notifications if they occur. The production area is equipped with a chip boiler integrated into the system via the Siemens MPI protocol.

The entire JS system is rounded off by the integration of an anti-intrusion station provided by Elmo, the whole system of emergency lighting provided by OVA and the sound system from Tutondo.

Since the Doimo production and administration facilities had been built in different periods, it was necessary to expand the initial LONWORKS network integrating new devices and new features. Thanks to the openness of the LONWORKS protocol, and the possibility to scale, and expand the network, it was easy to integrate devices from different manufacturers, creating a real multi-vendor installation. This flexibility will enable cost-effective expansion of the network in the future without massive masonry works.

**The Result:** Thanks to the "NEXT" system, Doimo Cityline has obtained full control of the entire building and all its features. The whole system is based on web technology and therefore accessible from anywhere via LAN or WAN. Through clear and simple graphic interfaces the system allows easy and simple control of each room, thus optimizing energy consumption. All integrated subsystems are continuously monitored, allowing quick targeted interventions in case of malfunction or anomaly.

**ROI:** All data is recorded by the system equipment which allows the running of a consumption, temperature and trend analysis report feature and planning of optimized profiles in order to achieve the highest energy savings. The consumption saving is calculated to be about 25% to 35%.

**The Advantages:** Energy savings: Use of the facilities can be optimized depending on environmental conditions, the needs of staff and different tariff profiles.

- A single interface: allows contemporary management and uses the same software for all features. There is no

requirement for any specific software to manage different systems.

- Save management costs: constant monitoring and control of all the facilities allows staff to devote themselves to core activities. The effective reporting system reduces maintenance costs through an effective report of system faults in real time.
- Flexibility in restructuring-reconfiguration of the building: The possibility to redefine plants through the software offers significant savings on the adaptation of plants to any new organization of the building.

### System Components:

The system consists of:

- PC servers running the management
- system Next.
- Embedded PC with logic of access management.
- 1 Touchscreen 17"
- 13 L-VIs of the company SVEA

The entire system controls 8000 physical and logical points.

### Products List:

- 67 MLA22
- 120 MLD88
- 115 MLD66
- 50 MLD44
- 70 MLRI
- 11 MLRTR
- 9 Energy meter
- 120 Lighting/presence Sensor - SVEA
- 13 L-VIs – SVEA

### Integrated devices:

- EL.MO Intrusion detection system
- OVA Emergency lighting system
- TUTONDO Dissemination sound system
- Hiross
- Kieback&Peter Automation station
- FCC Planterm radiant heating panels
- Coster Automation station
- Siemens Automation station

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