

November 2016

DOMOTICS FOR ENERGY SAVINGS

The domotic devices of the GEWISS Chorus system help reduce the consumption of electricity, gas and water by 30%, while at the same time increasing the level of comfort and safety in the home.

To improve domestic comfort and reduce domestic consumption, GEWISS has created the Chorus domotic system that brings together the most advanced technologies and the unmistakable style of Italian design. The system permits the smart management of the home thanks to the automation of all the main functions (**air-conditioning, lighting, motorised systems**), encouraging a more sensible use of energy and hence significant savings on electricity, gas and water.

Chorus lets you choose the most suitable solution for every specific need: in fact, all the devices can be used together to obtain the highest energy class, or you can install just those you consider essential, perhaps adding others later while maintaining the compatibility with the entire system.

For example, to considerably decrease energy consumption in the home and electricity bills, Chorus thermostats can be installed, to **set different temperatures** depending on how the home is used **at different times of the day** or to **heat/provide air conditioning for just a few rooms**. Or, thanks to the light sensitive sensors and presence detectors installed throughout the home, **lights can be set to switch on/off automatically when people pass by** or when the amount of natural light from outside is insufficient. Another possibility is to install magnetic contacts on the windows; these communicate with the climate control devices to influence the heating/cooling functions and avoid useless waste.

A TANGIBLE EXAMPLE: SMART RENOVATION

To understand how the consumption levels of an existing home can be reduced, it's useful to consider the real example of a home of about 100 square metres (the typical Italian context). The functions, costs and potential energy savings have been defined on the basis of European Standard UNI EN 15232, that indicates the calculation methods and energy classification of electrical systems at EC level.

SOLUTION 1 - CONVENTIONAL SYSTEM IN ENERGY CLASS D

The renovation of the electrical system, using low consumption solutions, must respect the criteria laid down by the law (46/90 and 37/08) in line with Standard CEI 64-8. In particular, the renovation of the home (4 rooms plus 2 bathrooms) has to respect the obligations of "Level 1 – BASE" as per the new classification introduced by the regulations in September 2011. Thanks to this solution, the home will be provided with several socket-outlets and lighting, TV, telephone and data points, guaranteeing more safety and more comfort in every moment of the day.

In particular, the calculation of the necessary devices includes:

- socket-outlets for energy take-off (31);
- plates with the relative supports and push-buttons for the command and control of lights and electric loads (30);
- TV socket-outlets (4), telephone connectors (5), and anti-blackout lamps (2);



- a surface-mounting timed thermostat;
- one-way switches for moving the roller shutters;
- a surface-mounting enclosure;
- ReStart with autotest (automatic reset and residual current protection device);
- the appropriate number of miniature circuit breakers and residual current devices needed for the size of the system;
- indoor and outdoor entryphone position.

The overall cost of the material and labour for the renovation of the electrical system with a low degree of energy efficiency (Class D) is about € 2,500-3,000, depending on the design finishes chosen (NB: it is impossible to quantify the cost of any masonry work, which will vary considerably according to the age of the building).

SOLUTION 2 - DOMOTIC SYSTEM IN ENERGY CLASS A

To notably reduce the energy consumption of the home, and therefore the cost of the electricity bill, the renovation project involves interventions on the following aspects:

- A. heating/cooling system
- B. lighting system
- C. drives and motorised systems
- D. command devices

The energy protection and management devices (ReStart and miniature circuit breakers) used in the domestic enclosure, the socket-outlets, plates and ON/OFF push-buttons for electric loads are all the same as those in the low energy efficiency system.

HEATING SYSTEM: SMART CLIMATE CONTROL

The renovation project envisages independent climate management in each room of the home; that's the reason for the 8 surface-mounting thermostats with display, installed in every room for local temperature control.

Thanks to the thermostats, you can set different temperatures on the basis of how the home is actually being used at various times of day: you can choose to heat only certain rooms, automatically setting different temperatures in different areas. If the heating/conditioning system is operating, the opening of the windows would cause heat loss in winter and cool air loss in summer. In addition, the project foresees the installation of specific magnetic contacts on all the door and window frames, interacting with the domotic system: thanks to these contacts, the heating/cooling system of the individual room is activated/deactivated to avoid any useless waste of energy if doors or windows are kept open for long periods.



LIGHTING SYSTEM: SMART LIGHTING CONTROL

In the first high efficiency solution, the technological systems of the home were made fully automatic, with ten presence detectors distributed throughout the home. In all the areas of the home, light switch-on and switch-off is automated to coincide with the actual transit of people. The number of push-buttons and socket-outlets for energy take-off remains the same.

MOTORISED SYSTEMS: THE SMART CONTROL OF WINDOWS AND ROLLER SHUTTERS

The control of the roller shutters (shielding) is motorised and automatically activated by the presence detectors which, on the basis of outdoor light intensity, raise the shutters to maximise the inflow of natural light during the winter and lower them in the summer (in unoccupied parts of the home) to prevent the sun from overheating the rooms and hence increasing the consumption of the air-conditioning system. In addition, all the roller shutters can be timed so they are all closed in the evening to ensure the safety of the home (and reducing the loss of heated or cooled air). Each of the seven windows of the home is fitted with wireless magnetic contacts that communicate the status (open or closed) of the window: the control panel deactivates the terminals in the relative room to avoid any useless waste of energy.

DRIVES: THE SMART CONTROL OF DOMESTIC APPLIANCES

To further rationalise electricity consumption, you are advised to stipulate a 2-level tariff with your energy supplier. Without an automation system to manage off-peak consumption however, the division of electricity consumption levels may be difficult and, in some cases, lead to excessive consumption costs. The domotic system control panel lets you programme the domestic appliances (like the washing machine and dishwasher) to operate in the night and at weekends, when the specific cost of your electricity supply is lower. Two channels, connected to the washing machine and dishwasher respectively, receive the signal from the BUS system and allow these appliances to be used in a fully automatic manner. This means about 90% of the electricity consumed by domestic appliances can be consumed during the most cost-effective time bands.

And finally, the control panel can also be used to programme two simple scenes that make a notable contribution to energy savings and the safety of the home. The first scene is the centralised closure of the home:

- deactivating the environmental air-conditioning or activating the economy mode to reduce energy consumption;
- closing all the shielding devices to guarantee the safety of the home;
- disconnecting the power supply to all the automated loads;
- switching off all the lights.

The second scene is the centralised opening, to re-enable all the functions deactivated by the previous scene.



COMMAND DEVICES: A SYSTEM THAT'S EASY TO CONTROL AND MANAGE

As well as the conventional push-buttons for controlling the lighting, the renovation project also includes a control panel for managing all the system functions from one single point: apart from controlling lights and roller shutters in fact, the panel also lets you adjust the temperature in every room independently; what's more, each terminal can be timed to avoid useless energy waste when there is nobody in that specific area.

ECONOMIC QUANTIFICATION AND ADVANTAGES FOR THE USER

In the home in question, the additional cost of material and labour to produce a Class A system solution can vary from **€5,000 to €10,000**, depending on the finishes chosen.

Thanks to this system solution, **it is possible to obtain savings on electricity and gas consumption amounting to more than 25% of total annual consumption levels**; depending on habits and behaviour therefore, the initial investment to produce a Class A system can be amortised in roughly 7-10 years.

Apart from the medium-term economic advantage, the implementation of this solution also has a considerable impact on the value of the home: thanks to these modifications, the value will be notably higher compared with the low energy efficiency solution.

