HOME AUTOMATION WITH PLC & TOUCHBERRY

Home automation is the concept referred to the integration of different technologies at home through the simultaneous use of electricity, electronics, computers and telecommunications. Its purpose is to improve safety, comfort, flexibility, communications, energy savings, facilitate comprehensive control of systems for users and offer new services.

SUMMARY

Home automation is a way of adapting to social changes. One of its functions is to facilitate and automate routine processes, so that you gain more time to do what really matters. However, it is worth making a clarification: although there is a lot of technology involved, home automation allows you to have more humane, more personal, multifunctional and flexible homes. In conclusion, if you have a smart home, you will not probably spend more energy starting the washing machine every day.

This type of project belongs to the so-called IoT since it incorporates different devices connected to each other and controlled by a programmable automaton, with which you can communicate to extract information or modify their behavior.

These are the areas on which this project will be based:

- **Automation and Control** - includes the control (open/close and regulation) of lighting, air conditioning, blinds, doors, and appliances.
- **Security** - includes intrusion alarms and technical alarms (fire, gas, power failure).
- **Audio and video** - includes the distribution of video images recorded with cameras inside and outside the home to the µSD card of the PLC.

Apart from the devices we are implementing, you could add functionalities such as warnings by phone, sms or email of the arrival or departure of third parties to the home such as children or housekeepers.

CASE STUDY

GOAL

The aim of this project is to create a system which can collect the information from several sensors located in different parts of the house and also actuators in order to control the devices according to the information collected or the user's needs which can be preset.

CONCLUSION (HARDWARE)

To achieve our goal, let's design the structure of the system. We have thought of a simplified model because the main idea will be easier to understand and, starting from this point on, you will be able to develop it for your house.

All the devices and sensors will be controlled by an Industrial Shields' PLC; in this case, you will need one industrial controller of the GPRS family to be able to send the alarms to your phone.

To collect all the necessary information to be able to act on the different devices, you will need a series of sensors that will be directly connected to the PLC:

- For air conditioning you will need a thermostat (**temperature sensor**) that will provide an analog input and depending on the selected temperature you will turn the air on or off.
- In the case of the accesses to the house (doors and windows), you are going to install **capacitive sensors** in each one of them (digital inputs), that will indicate when they are open.
- The lights in each room will be switched on based on the **presence sensors** installed in each room, so there will only be light in a room if there is someone there.
- In order to create the alarms, you need 2 types of sensors; to detect a fire, there will be a **smoke sensor** and if there is a gas leak you will know it by an **air quality sensor**.
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CASE STUDY

The blinds of the house will be able to go up and down by means of engines connected to the PLC. In the case of appliances, they will have to be smart to be able to transmit the information through Bluetooth and you are going to control them directly with the PC panel since it has this kind of communication

The alarms that will be sent to your phone will be activated according to the smoke levels and air quality. When you leave the house, you will have to press a button that will be read by the program and will interpret that there is nobody in the house. In the event that a window or door is opened, the alarm will be activated and you will be notified. There is also the option of installing surveillance cameras that can transmit everything they are recording to the PLC and save it on the µSD card of the PLC.

The TouchBerry PC panel will control the PLC and will be the user's interface where you can control all the system.