



## Home automation: evolution of security and comfort in your home

*Home automation: evolution of safety and comfort in your home*

Adriano Ferreira ALVES  
André Henrique Muniz COSTA  
Gustavo Sousa SANCTION  
Lucca Santos de Oliveira LIMA

(Adviser: Luciano Pimenta VALADARES)

Submitted on: 08/21/2022

Approved on: 08/21/2022

Published on: 08/23/2022 DOI:

10.51473/rcmos.v2i2.344

### SUMMARY

The objective of this article is to show the importance, operation and management of residential security systems, how these devices are installed, their installation prescriptions, and how automation contributes to greater comfort and practicality in the installation and use of these devices. It presents its functions, its control facilities, in accordance with the plans required by the client. It shows your objectives and how these systems work in this area of automation. Furthermore, it describes the advantages and benefits that the implementation of these mechanisms brings to the safety and well-being of the individual. It presents the installation techniques of these systems, their occasions, proposals and insertions, in addition, it presents the use of ABNT standards in the establishment of the devices, in addition to presenting them.

**Key words:** Security, automation, devices, software, residential

### ABSTRACT

The purpose of this article is to show the importance, functioning and management of residential security systems, how these devices are installed, their installation requirements, and how automation contributes to greater comfort and practicality in the installation and use of these devices. It presents its functions, its control facilities, according to the plans required by the client. It shows its objectives and how these systems work in this area of automation. In addition, it describes the advantages and benefits that the establishment of these mechanisms add to the safety and well-being of the individual. It provides the installation techniques of these systems, their occasions, proposals and insertions, in addition, it presents the use of ABNT standards in the establishment of the devices, in addition to presenting them.

**Keyword:** Security, automation, devices, software, residential

### 1. INTRODUCTION

This article briefly shows how an autonomous home can fit into your routine and how practical it can be handled, having several benefits for quality of life and the ease of handling your electronic equipment, solving your residential problems.

Automation has been gaining extensive space throughout the world, even more so when it comes to residential areas, expanding as technology advances and greatly facilitates the experience and practicality of people's lives, greatly reducing the slowness of simple or which require a little more effort. Being executed by a remote command via software or by a device.

1

The use of these systems has become greater during these years, with their boom occurring with the 2nd industrial revolution in the 19th century, giving rise to a new concept of automation, due to the use of electricity in the production process in industrial automation. As a result, the concept of home automation emerged in the 1970s in the USA, when the first automated control systems were created for industrial applications. It has been molding itself into homes to make everyday life easier.

In this article, we look at how devices and their evolution affect the safety of your home,



reinforcing the idea that the increase in crime leads residents to seek to reinforce their security through these automations, with the implementation of security cameras, electric fences, alarm systems and in some cases even thermographic systems

The most common security problems are: handling, cost and lack of protection and privacy. The lack of automation in homes that do not have any security system makes it easier to invade your property and home, for example: a poorly installed electronic entrance with a low security system, posing risks to the security of your home.

Automation is growing in the face of technology with each passing day, and with this, the usefulness of this automation equipment also grows. The reason why its use increases is facilitate the monitoring and control of various systems in your home, through the integration of various controls into an intuitive interface, whether on your cell phone, displays or keypads (a set of buttons arranged in a block, which generally have digits, symbols and generally a set complete with alphabetical letters) installed in different areas of your home.

The objective of this article is to show the practicality of handling and installation, intending to impose ways of solving problems with obsolete equipment or improving these systems for future use with automation throughout the home. The equipment used is: lighting systems, sockets, electronic locks, security systems, air conditioning, TVs, gate motors, among other appliances of your choice to be controlled remotely via Wi-Fi.

Using it for activation, such as: your cell phone, voice activation, presence sensors, sensors with photocells, devices under infrared handling (television or air conditioning remote controls, for example). And the objective of home automation is the integration of information and entertainment access technologies, in this case focused on use for security, with the optimization of this tool.

All this with an installation that will often not require the relocation of conduits, or new conduits, the passage of new cables, with an attractive cost-benefit, for a better quality of life, it was observed that it is worth investing in this process.

It can be activated from your home (the autonomous equipment), with you anywhere in the world, all you need is an internet connection to perform this service, therefore, you will have control over your equipment and even in some cases, know how much energy is being consumed by that equipment in real time or periodically.

What draws a lot of attention to this subject is that: the possibility of customizing your home according to your routine or your tastes so that everything happens more efficiently, also bringing greater savings in monthly energy consumption, with some adjustments, better security and practicality when we talk about electronic locks, security cameras, presence sensors and video monitoring.

## 2. HOME AUTOMATION

According to Roggia, 2016. p.15), a simple definition for automation is that of a control system by which mechanisms verify their own operation, taking measurements and introducing corrections, without the need for human intervention.

Automation is defined as a set of technologies capable of programming events in a home and making the operation of technological equipment automatic and practical. Through integrated systems and internet connection, a solution that provides previously unimaginable comfort to its users. Therefore, it is a flexible and expandable technology, in which the user himself stipulates how he will benefit from this concept.

The objective is to connect devices, devices and systems to each other, which will be activated and communicate through centralized control, accessed by smartphones, tablets, computers, etc., including:

Home appliances;

Lights;

Electrical sockets;  
Alarms;  
Temperature control system (cooling and heating); Smoke detectors/Fire fighting Windows and doors;

Garden irrigation system;  
Surveillance cameras, and many other devices and sensors

## 2.1 SAFETY

According to the website **Concept of**, Security is the action or effect of holding, it is that which presents firmness, stability, certainty, guarantee and trust.

The action of making safe is also characterized by security. It is applied in several areas, always in accordance with the perimeters established by each of them, however, always with the same concept characterized for the protection of the individual and/or machines and systems.

Devices are used that guarantee the security of systems, locations, those who handle them, etc. Always follow its implementation rules.

## 2.2 SAFETY IN RESIDENTIAL AUTOMATION

Security in the area of home automation is applied through the devices mentioned above and the implementation of specific security devices, such as: cameras, electronic gates, electric fences, alarms, etc.

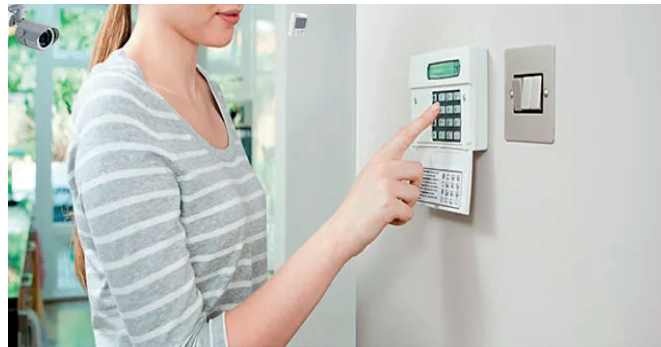


Image 1 - Alarm activation (Private Security Management Blog)

This makes use of this equipment even easier, facilitating use, monitoring and comfort from a distance. Many of these systems work using smartphones and an internet connection, but there are their particularities depending on the type of equipment used. It can also be expanded with the use of sound equipment and air conditioning, opening and closing curtains and monitoring the entry and exit of people in the residence, facilitating the recognition of the individual in the event of an invasion. All of this designed to the customer's taste and needs.

data. With this, we can mention some steps in home automation:

3

Choose which functionalities you want to implement

Define which environments will have automation, and prepare new environments for future implementations, if necessary

Identify the main types of existing systems for automation Look for a company specialized in this area to develop the entire project Monitor the project, making sure it is in accordance with the request

Demand a guarantee on the project.

For greater security in these systems, it is important to insert a UPS (a protective device that comes with a battery. In case of power outages or variations, it protects electronic equipment by functioning as a power source in the system). If an individual wants to break into your home, one of the first things they will do is cut off the power to the area. The UPS is equipped with energy autonomy for a certain period of time, maintaining the functioning of the security devices that will monitor the thief's actions.

### 3RESULTS

#### ADVANTAGES OF HOME AUTOMATION

##### 3.1 RESIDENTIAL SECURITY

According to WEG (a Brazilian multinational company headquartered in the city of Jaraguá do Sul, in the state of Santa Catarina), one of the biggest benefits of home automation is that the security system not only encompasses several automated resources, but also generates integration between them, further strengthening the protection of the home.

Figure 2 - Wireless surveillance system (Durawell)



- Electronic locks
- Smart video cameras remote monitoring
- Presence sensor with automated lighting
- Alarms

##### 3.2 WATER AND ENERGY SAVING

Also mentioned by WEG, smart devices contribute to the economy of your home. Lamps intelligent, for example, they rationalize energy consumption and can be regulated remotely, meaning they can be turned off far from home.

Other features allow monitoring water use, avoiding waste and saving money.

##### 3.3 PRACTICALITY AND CONVENIENCE

Another advantage is the ease and practicality that automation provides; in homes, these devices are used to make everyday life easier.



Figure 3 - Residential remote control (Kosten-haus,08/17/2021)

They can be controlled by remote controls, your smartphone and voice assistants. All the utensils that can be controlled by these devices make your daily use more practical, such as TVs, stereos, lamps, curtains and more.

### 3.4 COMFORT

The use of these devices brings greater comfort to your home, allowing you to control the lighting, lamp power, opening and closing curtains, air conditioning activation, fireplace etc.



Figure 4 - Comfort in system automation (air conditioning) (Foneplan)

## CONCLUSION

It is concluded that, through this article, automation more specifically, residential, is of utmost interest for the automation and amplification of security devices in homes.

The use of these systems aimed at the residential security area proved to be extremely important for surveillance, individual or family safety and protection, providing full residential monitoring. Automation facilitates the use of these monitoring systems at long range and in difficult conditions, using portable devices such as controls, software-implemented systems, smartphones, voice assistants and more. With the implementation of these systems, there is a feeling of credibility, comfort and security in your neighborhood or condominium, with the use of video surveillance cameras, alarms, sensors, electronic locks, electric fences etc. It can be proposed for future research, the use of these devices in industrial and business areas, obtaining

5

improving the safety of employees and managers

Taking into account that for good management of monthly expenses using these technologies, it is necessary to calculate monthly and installation costs after implementation. Considering the comfort and accessibility of these systems and how practicality facilitates your way of living and your comfort, we analyze their desired functionalities, implementation locations, definition of environments that will gain automation and prepare future environments as well. And it is extremely important to use ABNT protection standards when designing and installing any device on the electrical network.



## REFERENCES

Roggia, Leandro. **Industrial automation**/Leandro Roggia, Rodrigo Cardozo Fuentes. – Santa Maria: Federal University of Santa Maria, Industrial Technical College of Santa Maria, Rede e-Tec Brasil, 2016.

### Websites

[www.queroautomação.com.br](http://www.queroautomação.com.br)

[www.weg.net/](http://www.weg.net/)

<https://www.significados.com.br>

<https://www.vivadecora.com.br/pro/automacao-residencial/>