



CASE STUDY

INDUSTRIAL SHIELDS

AUTOMATED SECURITY SYSTEM

This project is designed to make a fully-equipped security system capable to be focused to different dangers, adapting itself to specific objectives. It is going to encompass a large range of possible hazard points as the steals, the fires and the gas contaminations. All of these will be tracked by different kind of sensors, managed by an Arduino based PLC. The data is going to be monitored by several PC Panels and a MQTT Server which will provide the possibility of the simultaneous connection of distinct devices. It will provide a 24/7 backup, saving the data in the SD card and sending it to the Server through an optimized and secure method called FTP.

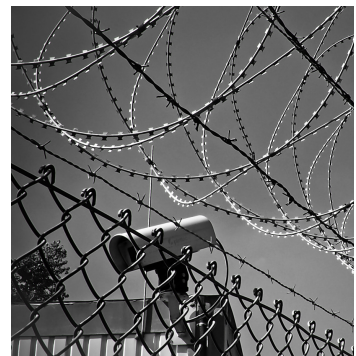
SUMMARY

The system is going to follow a defined structure. The data will be registered by several sensors; to have stealing protection, they going to be needed security cameras and motion sensors, for more industrial dangerous processes, it will be important to have gas and fire protection with the respective sensors for each other. All of this information will be sent to an Ethernet & GPRS/GSM PLC which will be the center of operations of the system. To be monitored and controlled, these data will be shown, though a Switch, to several Panel PCs and, through a broker MQTT Server too, it will bring the chance to manage the system with an external remote device as a phone, tablet or PC. All the interface is going to be based in Node-Red. It is crucial to have a backup; the sensors data is saved in the PLC's SD card and send to the Server using FTP and the camera part is sent directly to the server because of the size of the video files.

OBJECTIVE

The main points to achieve are the following:

- Automate a security system.
- All processes controlled and monitored 24/7.
- Easy management; through the PLC, the Panel PC, even so using a mobile phone, a tablet or a PC.
- High security level; the system is going to be built to be proof against thieves, hackers, fire and gas.
- Versatility as a security weapon; more sensors and monitoring methods could be added and the data always have a backup using different communication ways (Ethernet and GPRS/GSM).
- Adaptability; the system could be modified respect the hardware and reprogrammed respect the software to adapt to every little change in the system.



CASE STUDY

FINAL SOLUTION (HARDWARE)

The security system will be fully automated, instead of some specific parameters that have to be set and the reaction method chose against the danger. There will be four type of sensors; motion sensors and security cameras to avoid robberies, Infra-Red sensors to avoid fires and gas sensors to avoid intoxication caused by this kind of contamination. The information collected by all of these analog inputs will be processed by an Ethernet & GPRS/GSM PLC that is going to be previously programmed for this kind of use. The communication between the sensors and the PLC could be done using different protocols as RS232 and RS485, always checking if the sensors support them.

Once the data passed through the brain of the system, it has to be monitored by two different methods; the first one is using several PC Panels connected by Ethernet cable and a Switch to distribute the different connections. The second one is, using a MQTT dedicated Server where the data is sent, you could connect to it and manage the system with different devices such as phones, tablets and PCs, anywhere and anytime. Both ways are going to provide a Node-Red based interface, easy to interact and ready to fit to different professional profiles.

A very important factor and more in a security system is to have a backup copy, always available to be consulted. This distribution provides one divided in two parts; the sensor data is saved in the PLC's SD card and send through GPRS/GSM signal to the Server which is going to be the information warehouse. Whereas the sensors backup will be sent with FTP (File Transfer Protocol), the camera recordings are going to be saved directly to the Server because the video files are too big for this protocol.

