



# CASE STUDY

INDUSTRIAL SHIELDS



## CONTROLLING AN HVAC SYSTEM WITH ARDUINO BASED PLC'S

Implementation of an HVAC system using the Industrial Shields equipments for a specific solution in this sector.

Installation composed of a server immersion cooling system, besides controlling temperature, odors and ventilation of the room where the whole system is installed.

## SUMMARY

Owing to the plant new requirements, the customer needs a new and powerful refrigerating system to improve the actual HVAC installation. It is also important to create an installation model that could be easily replicated, with flexibility to modify the actual sequence because it exists the possibility of sharing the oil refrigerator with new server farms, due to the spec of the cooler.

The project is a server farm with an specific refrigerator system based on oil. The particularity of this installation requires a great control and monitoring of the different critical parameters. Starting from the working temperature of the servers, the humidity, and also the oil odors, to maintain the environment clean and also functional.



# CASE STUDY



## OBJECTIVE

The HVAC system has to control a server submerged in a cooling system. The room and the tank has to be inside a certain range of temperature and humidity. A part from that, there is a ventilation system which is responsible for reducing oil odors that are in the plant so the operators can work on it.

## FINAL SOLUTION (HARDWARE)

The Industrial Shields equipment has to control the temperature (room and fluid), the humidity and the ventilation of an entire room with two critical elements, the temperature and also the odors.

To control the fluid it is required a PID implementation in the Arduino based PLC with a temperature sensor. The sensor value is compared with a setpoint and the PLC treats the flow that the cooler has to implement. The room climate is controlled by a dehumidifier/humidifier and an air conditioning. They are enabled or disabled depending on the values of the temperature and humidity sensors. The ventilation is treated with a variable frequency drive, The Arduino PLC makes the ventilator rotate faster or slower depending on the odor. The AFD (variable frequency drive) is controlled using an analog signal.

