



CASE STUDY

INDUSTRIAL SHIELDS

SEMICONDUCTOR MANUFACTURING PROCESS

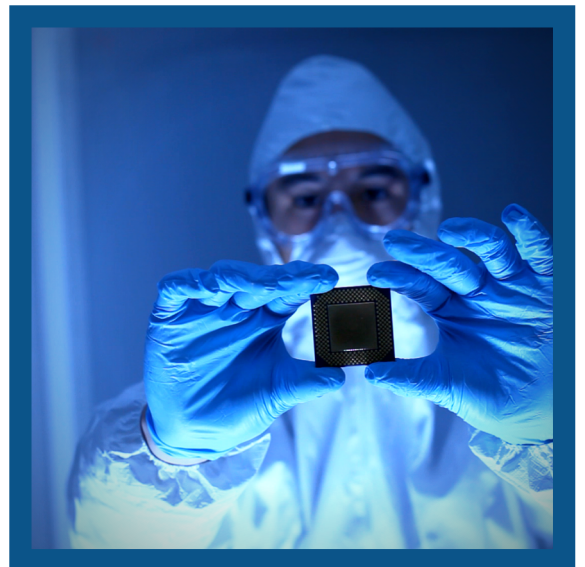
The semiconductor materials manufacturing industries have been improving their products at exponential levels for years. Technology advances very quickly and small changes are very important in order to compete on the market.

A distribution company is looking for a solution to implement some system for its final customers that will allow them to make a qualitative leap and get ahead of the competitors. In this case, the aim of Industrial Shields is to optimise process control and reduce costs.

SUMMARY

In recent years, **semiconductor** materials have become increasingly important in our world.

Today, they are present in almost all areas of our lives and are a key part of them. They can be used both as conductors and as insulators, depending on their characteristics, providing great usefulness in the industrial environment.



GOALS

Our customer is looking for a solution to **optimize** some part of the semiconductor **manufacturing**, **reducing costs** to compete in the market.

As the whole creation process is already following strict requirements, Industrial Shields has focused on optimizing the clean room where the silicon wafers are stored before processing.

The goals are to implement:

- different types of **sensors** and
- an **electrical solution**

to regulate the lights and optimize their consumption..



CASE STUDY

CONCLUSION (HARDWARE)

Clean rooms must be permanently in very specific conditions so as not to damage the products. In the case of semiconductor materials, they should be exposed to an ideal room temperature of 22 degrees, between a maximum of 26° and a minimum of 18°; humidity levels should be between 30 and 60 %. In addition, there cannot be dust levels higher than 80k units for 0.028m³.

The system proposed to be installed will consist of an **open source based industrial PLC** that will act as a master controller for all sensors and will allow to:

- send the data to an external server and
- monitor an alarm system.

In addition, an extra **touch screen** will be placed to interact with the system from outside the clean room.

The first **sensors** to be implemented will be **temperature** ones. For a better measurement, it will be necessary to set some in the different places of the room, since any variation could permanently damage the products. Like the temperature sensors, the **humidity** and dust **sensors** will be placed throughout the room to obtain the maximum reliability in the results.

Industrial Shields PLCs can be set with multiple sensors working at the same time, choosing one of their communications, such as I2C or RS485 with Modbus, depending on the devices and the distance to operate. All collected data will be sent via Ethernet or Wi-Fi to a "backup" database server and also to a cloud server where it could be monitored from another location.

The **advantages** of working with open source PLCs are :

- their **economical price** and
- the **wide variety of options** they can provide.

Extra features could be added later to improve the system. One option would be to control the lights in the room with a DALI system, timing when they should be opened or turned off, thus saving money.

