



CASE STUDY

INDUSTRIAL SHIELDS



AUTOMOBILE PRODUCTION LINE

This project is designed to make an automobile production line system capable to be adapted to different needs. The production line will be automated using a PLC that will control all the processes and the robots behaviours and a Panel PC will be able to monitorize them and to become the management point respect the input-output data feed.

This application could be applied remotely using an Ethernet PLC if it is necessary and the information can be accessed wherever you want, through a VPN connected to our MQTT server. This database could be shown on a Panel PC based on Raspberry Pi3 that will monitor all the information.

SUMMARY

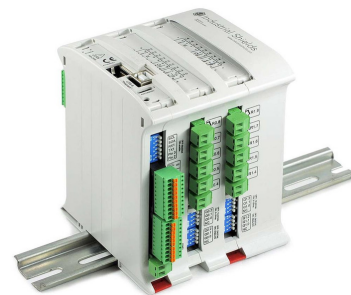
All the important production line data will be collected using all kind of sensors; for example, load cells to weigh certain pieces, lasers to measure distances, pressure devices to measure the force applied assembling the pieces, etc. All this information will be sent to an Arduino based PLC, where it will be processed and, considering the specific orders previously programmed or the ones introduced through the Panel PC, the PLC may send the commands to the production line actuators such as all the mechanized arms and the robots to execute all the orders. All this information can be monitorized through the Panel PC, where you can control and configure all the system parameters. In the Panel PC there will be also a broker server (MQTT) that is responsible for receiving and sending data between the PLC and the Panel PC. To monitor the data, Node-Red will be used.



OBJECTIVE

The main points to achieve are the following:

- Automobile production line automation.
- All processes controlled and monitorized 24/7.
- Easy management; through the PLC, the Panel PC, even so using a mobile phone or a tablet.
- Divided labor camps respect the monitoring interface.
- Wide embracing respect the differnt lines (possibility to select one line or another and to apply this to different parameters).
- Adaptability; the system could be modified respect the hardware and reprogrammed respect the software to adapt to every little change in the line.



CASE STUDY

FINAL SOLUTION (HARDWARE)

The automobile production line will be fully automated, instead of the specific control parameters that have to be set. All the important data could be collected through all kind of different sensors, like the ones said previously. This information will be sent to an Ethernet PLC which will be previously programmed to process all the input data and manage the output orders to the actuators in a certain way.

When the input data will be in the PLC, it will send it to the Panel PC using Ethernet and you could monitorize it. Like we said, there could be specific orders previously saved inside the PLC or we can change and manage this control with the Panel PC too. All this Panel PC actions could be done through another device such as a cell phone or a tablet because of the WiFi connection between this and the panel. To monitor all the data and to establish this connections with a phone/tablet, Node-Red will be used and a server has to be created and configured.

Once all the orders are introduced to the system, they will be sent to the actuators like all the line machinery (robots, mechanized arms, etc.). All the input and output data could be digital or analog, always taking into account the available i/o of both kinds in our devices. The actuators will execute the orders and you can monitorize and manage everything through the Panel PC, the phone or the tablet. This system could be applied to different production lines and adapted to different changes. Remember that this is a case study and it can be modified as your thoughts.

