



TOOLS for SMART MINDS

Case Study



Supervision software for automated end-of-line testing, aimed at testing pressure gauges for the automotive industry

Wonder

Goals

- Automation of testing activities, marking and printing of test certificates
- Work simplification for the personnel
- Total traceability of work phases
- Reduction of human error
- Increasing of department productivity
- Reduction of repetitive manual tasks to improve personnel working conditions

Solution

The solution is the development of supervision and coordination software for machinery from different suppliers that can be interconnected using heterogeneous communication technologies and protocols.

Resources

- LabVIEW
- Microsoft SQL Server

The Challenge

Wonder S.p.A. is the European leader in the production of **high quality pressure gauges for the automotive sector**.

In order to **improve the productivity** of the end-of-line testing phase of all products, laser marking and packaging before shipment to customers, Wonder has created an **integrated workstation** consisting of several stations:

- **3 end-of-line test stations** with leak test and cameras for intelligent quadrant control
- high-performance **laser marking system**, programmable via network
- **multi-buffer palletizer** with integrated robot
- packaging label **printers**
- test certificate **printers**

All the components of the workstation have been **purchased from different suppliers** and must be coordinated by a software that transmits the **information to the testing stations**, **collects** the data of the tests carried out and **stores** them in the company database, with **all the information related to the serial numbers of the different products**.

The supervision software must also **transfer the information** of each product to the **laser marking system** and **coordinate the work** of the **robot** in the palletizer so that different products are managed in the correct way and time.

The supervisor software must have a **simple and clear interface** to **allow personnel to manage the different activities** on the workstation.



In 1947 Gianfranco Carutti founded a small factory that manufactured valves on the outskirts of the city of Cremona. With a degree in mechanical engineering from Milan Regio Politecnico obtained in 1938, Gianfranco Carutti was the son of a machine tool trader from Milan with close links with the car industry.

He soon came into contact with his father's business contacts who were important industrialists in the Milan area including the Pirelli family.

The Pirellis were the ones who told the young Gianfranco that tyre valve manufacturing would shortly begin a period of strong growth. At this point, intuition played its part: once he had found a suitable area at a low cost on the outskirts of Cremona, Carutti moved from Milan and founded Wonder.

The company specialised in the manufacturing of butyl valves for inner tubes. Its first customer was Pirelli, but in a short space of time, helped by the economic recovery in the 1950s, Carutti managed to enter into agreements with other major inner tube manufacturers including Ceat (founded by Virginio Bruni Tedeschi), Michelin, Goodyear and Firestone.

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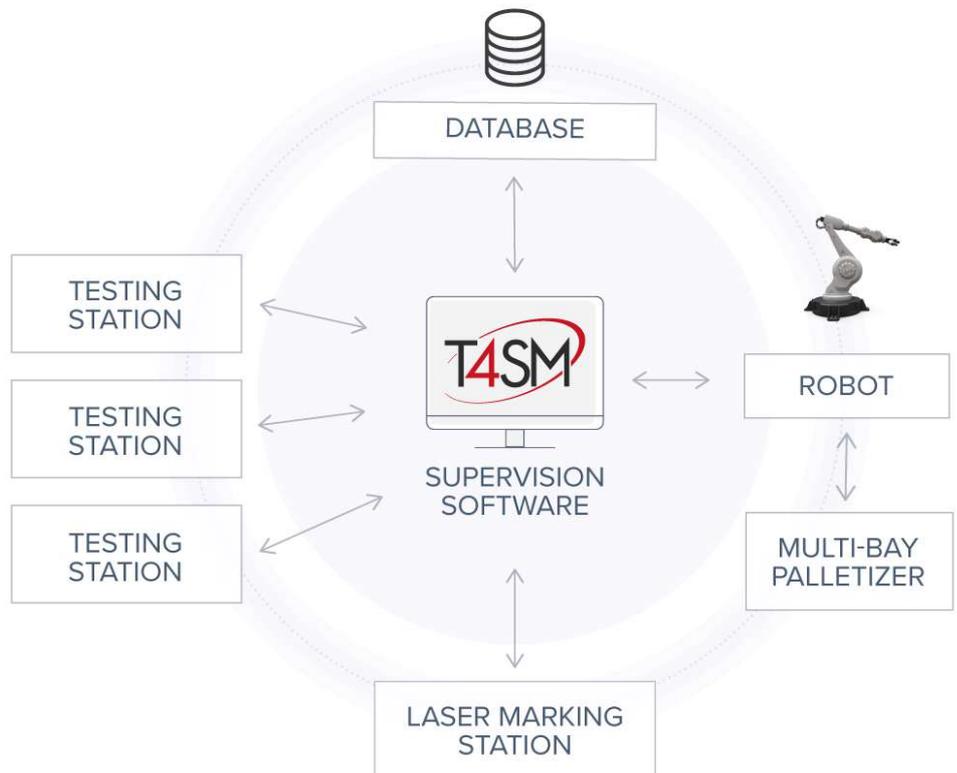
Solution

To meet Wonder's requirements, the supervision software was **designed with the heads of the testing and marking department** so that all information was immediately available to the operators.

The communication drivers were developed with the Siemens PLC that controls the palletizer and the data exchange modules with the test workstations and the laser marker.

Together with Wonder's technicians, the data collection database was designed so that Wonder can **trace all the information from the pressure gauges in a complete and reliable manner**.

The **certificate generation module is parametrically** designed to allow Wonder to modify the certificate layout according to its needs.



Solution Diagram of the supervision software



TOOLS for SMART MINDS (T4SM) is a system integrator that develops software solutions for manufacturing companies.

T4SM is Alliance Partner of National Instruments and the development team consists of Certified LabVIEW Architects (CLA) who have long experience in LV Real-Time Programming and LV-FPGA.

T4SM designs from scratch to high-quality solutions easily integrable with third-party products, which help customers to shorten time-to-market of their systems.

T4SM uses the AGILE methodology for the development of software projects and the co-design of applications with immediate benefits for customers, helping them to gain a competitive advantage over competitors.

For technical support and product information:

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TOOLS for SMART MINDS

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Benefits and Results

All the objectives set have been achieved, allowing Wonder to achieve the following benefits:

- **Saving of time:** the personnel can dedicate themselves to assembling and loading the products on the conveyor belts at the entrance to the workstation. The repetitive testing and marking activities are now fully managed by the robot.
- **Production traceability:** all data is managed through barcode readers and therefore the company can know in real-time the progress of production and know every data of every pressure meter that entered the automated workstation.
- **Efficiency control:** with the automated data collection, the production managers can know in detail all the testing and marking phases and define the best strategies to optimize the overall efficiency of the different work phases.
- **Cost determination:** with the data collected automatically, it is possible to have a precise account of the costs of every single working phase of the workstation (testing, marking, packaging management, etc.).
- **Reduction of human errors:** data acquisition is automatic, reducing errors due to manual operations.
- **Automatic management of certificates and labels:** the integration of the printers has made it possible to simplify all the management of the documentation of the labels to be applied to the boxes, simplifying the work of the personnel.

Client Comment

“We are fully satisfied with the solution developed by T4SM because, although it has provided us with an advanced and complex solution that effectively tracks all the data of the phases of our product calibration process, the interface is user friendly and the operators have learned to manage the process quickly, in complete autonomy.”

Ing. Riccardo Dusi, ICT Manager, WONDER SPA