



## Industry 4.0 Interconnection

### F.Ili Carminati

#### Challenges

- Interconnect the Novarobotics broaching loading robot
- Have downtime
- Automate data collection
- Respecting the requirements of the State Business Plan 4.0

#### Solution

- Based on a system consisting of iDaq and Digital Factory 4.0 that communicate with the robot and the management system

#### Resources

- iDaq
- Digital Factory 4.0 Lite
- Liliium

### The Goals

**F.Ili Carminati** is a company with experience in the field of mechanics and expert in the broaching process. It boasts a solid specialization in broaching, slotting and grinding work for third parties, in addition to the production of its own hydraulic pumps.

**Its goal is to become Industry 4.0** to be more efficient and competitive and respond to the challenges of the ever-changing market.

**The challenge is to interconnect** the broaching load robot with the management system and the company MES with the aim of automating data collection, tracking down and knowing the cost associated with each job and therefore having to interconnect different hardware and software entities.

The company also want to take advantage of the opportunity offered by the **Business Plan 4.0**, which offers state incentives to promote the technological innovation of the country: further objective to be achieved is, therefore, compliance with the requirements of the Italian legislature in this regard.



Certified according to the UNI EN ISO 9001:2015 standards and thanks to its many years of experience in the mechanical engineering sector, F.lli Carminati snc boasts a solid specialization in broaching, slotting and grinding work for third parties, in addition to producing its own hydraulic pumps. Born in Brescia in the '60s, over time F.lli Carminati snc has managed to develop acquiring know-how, skills and technologies in step with the constant evolution of the market, this has allowed it to remain competitive and cutting edge in its sector.

[www.fratellicarminati.it](http://www.fratellicarminati.it)

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## Solution

T4SM solved the needs of F.lli Carminati in a very short time by using software already developed and tested for long internally.

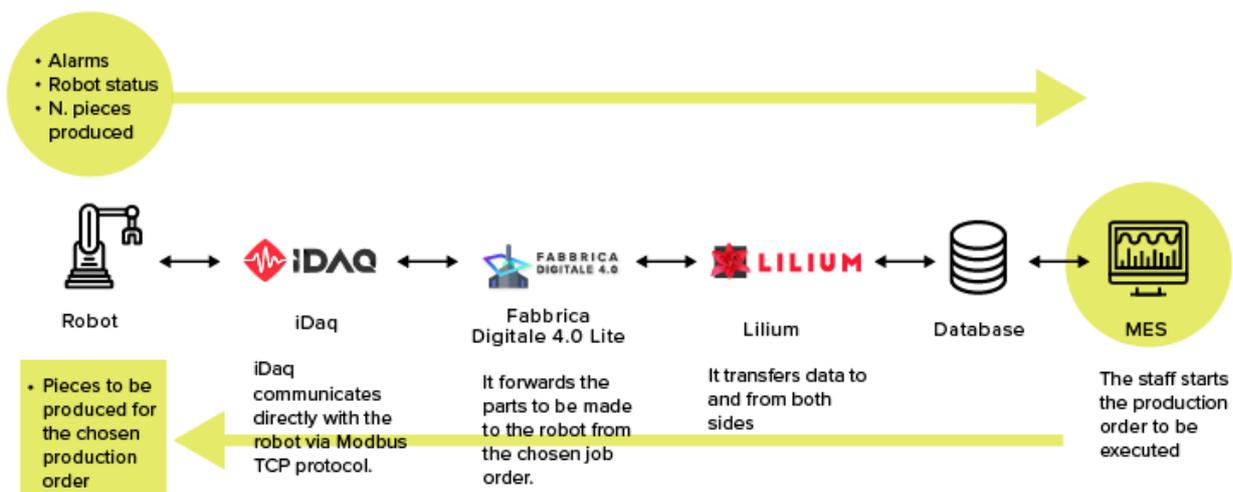
**iDaq** is used to communicate directly with the robot (Novarobotics) via Modbus TCP protocol.

**iDaq** collects the main production and process data, such as:

- Alarms
- Robot status
- Number of pieces produced
- Process data, such as the torque measured on the joints of the robot

**Digital Factory 4.0 Lite** provides a global view of the plant and forwards the pieces that the robot must process based on the order that the operator chooses from the MES.

**Lilium** deals with the transfer of data to the company database, from which the MES extrapolates the information for viewing and archiving, and the transfer of data from the database to **Digital Factory 4.0** and **iDaq**.





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:

[www.toolsforsmartminds.com](http://www.toolsforsmartminds.com)

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## Benefits and Results

All the pre-established objectives have been achieved, thus succeeding F.lli Carminati to obtain significant benefits:

- **Time-saving:** the operator can now initiate an order from the MES and the production data required for the robot to operate are sent automatically.
- **Cost determination:** with all process and production data collected automatically, an accurate cost report can be obtained.
- **Reduction of human errors:** data acquisition is automatic, reducing errors due to manual operations.
- **Traceability:** all the data of the production cycle are tracked and there is a production history committed per job.
- **State Incentives of the Business Plan 4.0:** all the requisites required by the Italian legislature have been respected.

*"Our company was looking for a partner able to interconnect our new machinery to the developing management system. Our request was to have all the data related to the processing, interconnect them with the management system that we were developing and manage them from a single location, being able to fall within the development plan of Industry 4.0. The decision to rely on T4SM as a supplier was made after some meetings and was a winner one. In a very short time they managed to develop what was required by interfacing directly with those who were developing the management system. Given the excellent work we have decided to entrust T4SM with the expansion of the interconnection of the other machinery"*

**Marco Carminati**  
**Production and Logistics Manager**  
**F.lli Carminati Snc**