



## Industry 4.0: Machinery Interconnection for Guarni&Med

### Guarni&Med

#### Challenge

- Interconnection of machinery
- Automation of data collection
- To trace downtimes
- To know the cost associated with each batch
- Traceability of production
- Production control
- To know process data in real time through dedicated panels
- Compliance with the requirements of the Italian National Industry 4.0 Plan

#### Solution

- Based on a system consisting of iDaq, Digital Factory 4.0 and Liliun communicating with the company's machinery and MES

#### Resources

- iDaq
- Digital Factory 4.0
- Liliun

### The Challenge

Guarni&Med is specialized in the design and production of gaskets for the medical sector and for the most diverse industrial sectors.

The challenge is to **interconnect about a hundred machines of different brands, functions and ages, with the company management system and the MES**. The goal is to **automate data collection, track downtime, know the cost associated with each batch** and have the **traceability and control of production**.

Another requirement is to know the **machine states**, the number of **pieces produced**, the **good parts**, the **waste parts** and the **operating temperatures of the ovens in real time** and through **dedicated panels**.

Last but not least, another objective pursued is to seize the opportunity offered by the Italian **National Industry 4.0 Plan** for a small subset of machinery and to be able to take advantage of State incentives. It is, therefore, necessary to respect all the requirements of the legislature in this regard.

*Above, the "Clean Room"*



Guarni&Med is an Italian company founded in September 2009, and is dealing with the production and distribution of seals for medical and industrial use.

In February 2010, the company appeared on national and international market, starting its production activities focused molding, finishing, inspection, packing and finishing gaskets and technical elastomers and seals thermoplastic materials.

The synergy between the staff implemented the market opportunities completing the range of products.

The high skilled and experienced staff is able to support the customer at each stage of the process with expertise, reliability, quality and competitive prices.

Moulding, Finishing, Inspection, Packaging, Supplying of gaskets and technical articles made by elastomers and thermoplastic materials.

Engineers and technicians offer ideas and assist the customer during the co-design-phase in order to find the best solution for each specific application.

Experience, Research, Investments, High Technology equipments, Human Resources place Guarni&Med today among the market leaders supplier in the manufacturing of rubber and thermoplastic components.

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

**Guarni&Med**

Via G. Rossini, 19

24060 Credaro (BG) Italy

## Solution

To satisfy the need of Guarni&Med we used our long-tested **software for Industry 4.0: iDaq, Digital Factory 4.0 and Liliium**, achieving all the pre-established objectives with a complete and scalable solution.

**The machines, which are a hundred and of different types, are connected to the company MES** and a percentage of these machines directly receive the active order code and the article number to be produced. These are displayed on the panel on the machine.

*iDaq* deals with data collection directly from the field. It's in fact used to communicate with the machines via Modbus protocol, FINS and through other dedicated protocols. For each machine, moreover, *iDaq* conveys more signals taken from the machine itself, providing a single quantity that summarizes the operating status.

The main data acquired are:

- **Machine status**
- **Number of production pieces (piece count)**
- **Good pieces - scrap pieces**
- **Operating temperatures of ovens**



*Production*

## System integration - Interconnection

Solution diagram for Guarni&Med

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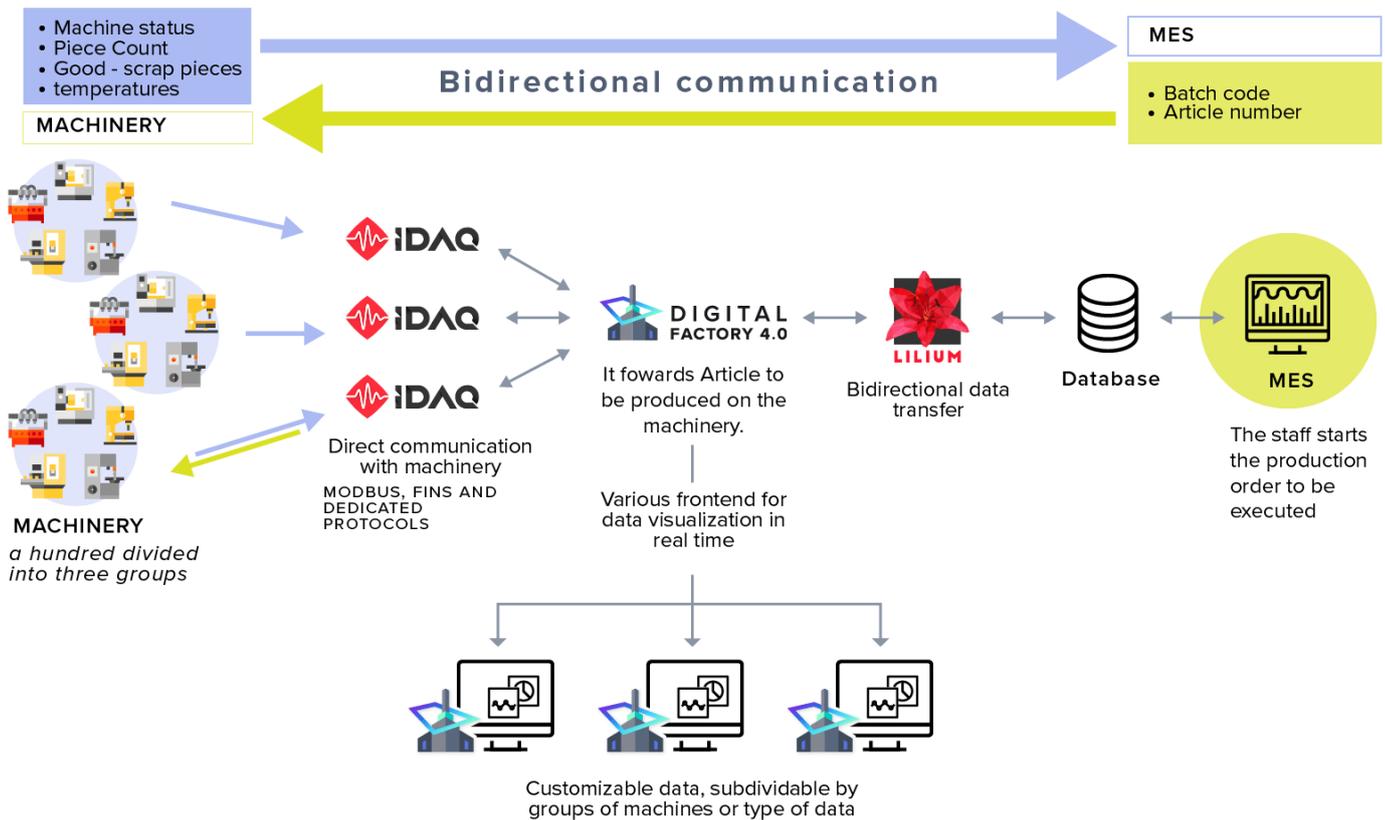


Diagram of company interconnection

**Digital Factory 4.0** collects all the data acquired by **iDaq**. It provides a global view of the data acquired by the plant's machinery and sends the batch codes and the article to be produced to a percentage of machines according to what the operator has chosen from the MES.

The data can be viewed in real time from different locations, each customizable according to criteria of subdivision of machinery or type of data.

The user interface presents three-dimensional images colored based on the state of the machinery and graphs, tables and clear numbers.

**Lilium** transfers 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**.



*Digital Factory 4.0 interface for the control of the various production areas of Guarni&Med (7 areas)*



*Automatic sorting*



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)

TOOLS for SMART MINDS  
Corporate headquarter  
Via Padania, 16  
25030 Castel Mella  
Brescia (Italy)

## Benefits and Results

All the pre-established objectives have been achieved, thus allowing Guarni&Med to obtain significant benefits:

- **Time-saving, production control:** The staff sends codes of articles to be produced per order initiated by the MES are sent directly to the specific machinery involved.
- **Production traceability:** all the data of the production cycle are tracked and there is a production history committed per batch.
- **Cost determination:** with the production data automatically collected, you can have a precise report on costs.
- **Reduction of human errors:** data acquisition is automatic, reducing errors due to manual operations.
- **Italian State Incentives of the National Industry 4.0 Plan:** all the requirements by the legislature have been respected in order to have access to tax benefits.

## Potentiality

The solution is **completely scalable**. From the point of view of the field, it allows both **to acquire new quantities**, and **to connect new machines** quickly, ensuring minimal impact on the existing system.

Moreover, thanks to the modularity of the solution, it's possible to interconnect machines with technologies and functions that are different from those already connected.

From a management point of view, the **solution is open to interfacing with third-party software** for **visualization, data analysis** and **business intelligence**.



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Finally, the solution allows to apply artificial intelligence algorithms, such as Machine Learning, predictive analysis and process drift control for each machine and plant. This makes it possible to foresee downtimes and breakages in order to promptly intervene and thus reducing downtime and production costs.

## Client Comment

*“With the T4SM team we have finally found the technology that will allow us to make a very important step in terms of quantity and quality of data collection, so we can aspire to enter into highly specialized and sophisticated markets where the tolerances of the gaskets to be produced are really very narrow.*

*Moreover, the willingness and competence of the T4SM CEO Mr. Vivante will stimulate us further to look for solutions to boost performances of our products more and more.”*

**Andrea Belometti**  
**President**  
**Guarni&med**