



TOOLS for SMART MINDS

Case Study



Machinery Interconnection for Industry 4.0 with Customized Protocols

METALP

Goals

- Machinery Interconnection
- Automation of data collection and history
- Cost monitoring for each order
- Real-time monitoring of the entire plant
- Compliance with National Industry 4.0 Plan requirements

Solution

Based on a system consisting of iDaq, Digital Factory 4.0 and Liliium that communicate with the machinery and the company MES.

Resources

- iDaq
- Digital Factory 4.0
- Liliium

The Challenge

METALP deals with the die-casting of zamak in the field of fashion accessories in the metal scene. The company has expanded with a new plant with new machines and needs to **interconnect** them to **improve production management** and to **increase productivity** and competitiveness on the market.

The challenge is to be able to **communicate with the machines**, some of which **don't have standard protocols**, and to connect them to the **MES** in use in the company, reading all the data to trace a production history.

METALP also wants to take the opportunity to access the fiscal **incentives** of the Italian National Industry 4.0 Plan and therefore it is necessary to comply with legal requirements.

The Paris brothers started a zamak die-casting business for the metal fashion accessory sector in a panorama that was already very lively at the time and still today, flanked by the fresh and shared initiative of the new generations that have taken over the company, they continue to respond to the many and changing needs of an increasingly demanding customer. From the conception of a model, to the design and manufacture of the mould, up to the moulding and finishing phase, METALP is increasingly able to understand the market demand and to materialize it into a finished product in the hands of the Customer with unparalleled efficiency and speed. Buttons, studs and buckles take shape from the dialogue between the demand and who, in the company, interprets it and directs it to the efficient production department that processes the piece from its conception to its accompaniment to those who, for market reasons, require it quickly and at very competitive prices. In order to achieve these results, the company has built a mix of style and design over the years, accompanied by a production process in which the latest production technologies in the field of mechanics and die-casting are subject to management and computer control along the entire path of the accessory, from raw material to delivery. METALP is more and more enthusiastic to continue a story that focuses on the Customer and his questions, offering a more and more dynamic face and never forgetting the teachings of a thirty-year presence on the market.

www.metalp.it

METALP

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The Solution

All METALP objectives have been achieved with a **complete and scalable solution**.

The machines connected to the company's MES are an Agrati press, a Galmec plant for galvanic machining, parts of a Georg Fischer machining island such as Heidenhain CNC milling machines and an electrical discharge machine.

The suppliers themselves were contacted directly to perform the **interconnection**. It was verified that one of the machines was equipped with the MTCConnect protocol, so this standard protocol was used.

To be able to communicate on machines that did not have standard protocols, several tests were carried out with suppliers to understand how the machine communicated, and then customized protocols were developed.

Industry 4.0 software already developed and extensively tested in T4SM was used to meet customer requirements:

- **iDaq** for communication with machinery;
- **Lilium** for data transfer;
- **Digital Factory 4.0** for real-time monitoring of the entire plant and data transfer from the MES to the machines.

iDaq is the solution that communicates directly with the machinery. The operating parameters needed by the customer are taken from each machine.

The acquired data are:

- **Machine status;**
- **Number of production pieces;**
- **Other production data and operating parameters.**

Digital Factory 4.0 collects all the data acquired by **iDaq**, allows its visualization and forwards the article to be produced on the machine.

Lilium automatically transfers the data to the company database, from which the customer's MES extracts the information for viewing and archiving.

The sending of data to the machines takes place in different ways.

For the Agrati press, when a new order is created in the MES, a file is created with the order name and the pieces to be produced in the on-board PC which is automatically read by the machine.

For the Galmecc plant, the modality is similar to the previous one but instead of the file, a record is created in the machine database.

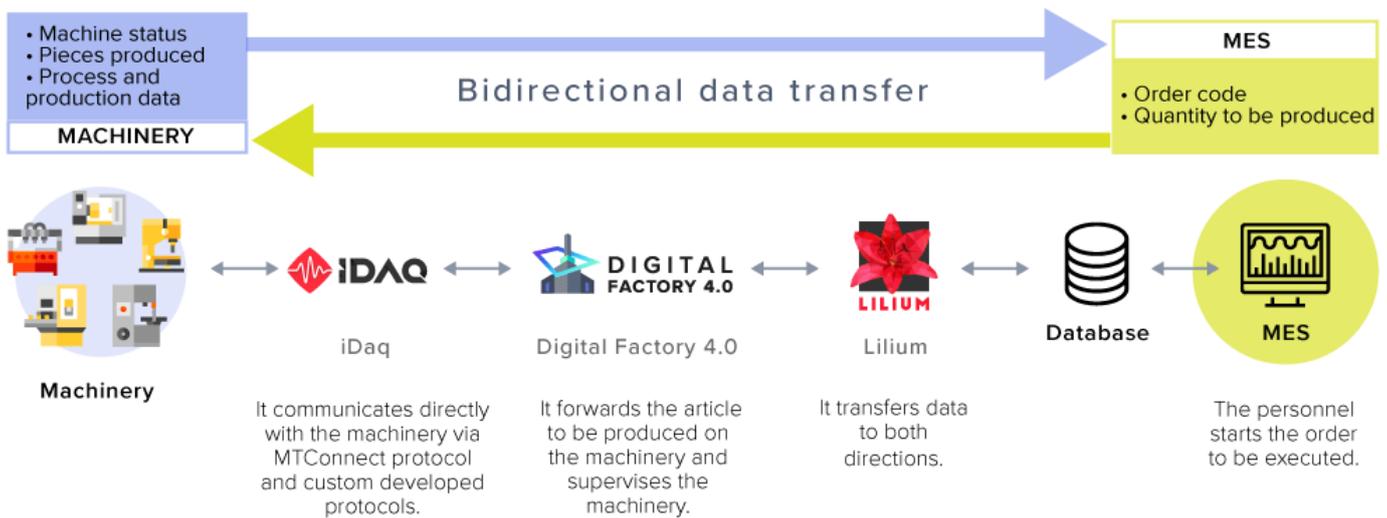
For Georg Fischer machines, instead, at the start of the order, the operator manually transfers the Part Program file.

Summing up, the information sent automatically to Agrati and Galmecc machines is:

- The job code;
- The number of parts to be produced.

CASE STUDY | INTERCONNECTION FOR INDUSTRY 4.0

T4SM DEVELOPED BY TOOLS for SMART MINDS



Industry 4.0 software solution diagram



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

TOOLS for SMART MINDS

Corporate headquarter

Via Padania, 16

25030 Castel Mella

Brescia (Italy)

Benefits and Results

All the objectives set have been achieved, thus enabling METALP to achieve considerable benefits:

- **Start of corporate digitization:** thanks to the solution, METALP has started the digitization process that allows it to produce more efficiently and to reduce costs.
- **Determination of times and costs per order:** data collection and interconnection with the MES allow METALP to have an accurate record of the production.
- **Production traceability:** all production cycle data is tracked by creating a production history order by order.
- **Reduction of human errors:** data acquisition and transmission are automated, reducing the possibility of human errors.
- **Immediately available data:** thanks to the automatic acquisition it is possible to share data in real-time with the offices.
- **Reduced paper documentation:** digital information management can save time and money, increasing business productivity.
- **Increased efficiency and time saving:** the personnel sends the codes of the articles to be produced, the number of the pieces and the Part Program from the MES to the machine according to the order, increasing efficiency.
- **Incentives of the Italian National Industry 4.0 Plan:** compliance with legal requirements allows METALP to access to fiscal benefits.



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The Potentiality

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

Thanks to the **modularity** of **iDag** it is possible to interconnect machines with technologies and functionalities even different from those already connected or to transfer the processed data to advanced data processing systems thanks to **Lilium**.

The system makes it possible a simple implementation of the other tools of the **Digital Factory 4.0 Suite** for the optimal management of **alarms**, with **Alarms**, or **machine configurations per order**, with **Part Program Manager**, and of **iDag Analytics** solution for the management of **preventive and predictive maintenance**.

Client Comment

"The collaboration with T4SM has been very important for the realization of our new digital 4.0 factory. Not only has it proposed innovative and effective solutions, but it has shown great ability and energy in the field implementation of the project, coordinating and stimulating all the actors involved in the process."

Giancarlo Paris

Owner

METALP