Digital solutions
With ENGEL on the way to the smart factory

Selected application examples
Rely on ENGEL’s proven digital solutions to exploit the full potential of your machines.
Design
sim link

Sampling
iQ clamp control
iQ melt control
iQ motion control
VirtMould

Production
iQ weight control
iQ flow control
iQ vibration control
iQ process observer
Data interfaces
TIG authentig

Maintenance & Service
e-connect
e-connect.monitor
e-connect.24

User Case Study
For ENGEL, the product life cycle of your plastic product is the basis on which the digitalisation strategy is aligned.

Product life cycle

Already during the **design phase** of your products and before the start of series production, during the **sampling**, you can leverage great optimisation potential with digital solutions. In **production**, you can ensure high productivity with sophisticated solutions for shop floor management. In the area of **maintenance and service**, intelligent monitoring and remote maintenance tools maximise your availability.

**inject 4.0**

is the umbrella term for digital solutions at ENGEL. Process stability, productivity, availability with maximum data security and flexibility are the guiding principles of inject 4.0.

**smart factory**

stands for networked and self-optimising injection moulding production.

**Worldwide**

3,000 customers have registered with ENGEL e-connect.
8,000 machines are connected with ENGEL.
8,600 machines are equipped with intelligent assistance systems from ENGEL.
12,000 machines are connected with TIG authentig.

"Are you still unsure whether digitalisation can also help you? Concrete practical examples show how well-known production companies from various industries are already successfully using digital solutions from ENGEL. See for yourself on the following pages. We look forward to consulting you."

Hannes Zach, Head of ENGEL Digital Solutions Sales,
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Watch the video „Digital solutions & features for injection moulding explained easily“ here.
Uncompromising precision

With iQ clamp control, dewatering specialist Dallmer increases quality and reproducibility and slows down wear.

State-of-the-art production is an important competitive factor for the German specialist in building drainage. The focus is on two topics in particular: Industry 4.0 and sustainability.

Customer: Dallmer
Country: Germany

Industry: Technical injection moulding
Products: Innovative sanitary technology
Challenge:

"We rely on very high moulding accuracy. Precision and repeatability are our key requirements for the injection moulding machines."

Andreas Föltz, Production Manager

Solution:

All newly delivered injection moulding machines were equipped with intelligent assistance systems from ENGEL’s inject 4.0 programme. iQ clamp control surprised Dallmer the most. The software determines the optimum clamping force for the respective injection moulding process on the basis of mould breathing and in some cases reduces the clamping force from 1200 to 800 kN during the production of DallDrain components.

Results:

"We are thus further increasing quality and reproducibility. We can reliably eliminate overmolding and burr formation, and on top of that we improve mold venting and slow down wear."

Andreas Föltz

- The optimally adjusted clamping force increases energy efficiency and protects the mould
- Significant reduction of parts with burns or burrs.
- Automatically determines the ideal clamping force and adjusts it in response to changes in the process.
- Detects quality-relevant information on the injection mould easily and without additional sensors.

Here you can find more information about ENGEL iQ clamp control.
Switching to constant quality
How Braun avoids waste with iQ weight control

The goal of every injection moulder is to produce moulded parts with consistently high quality shot after shot. The iQ weight control process makes this goal tangible. Braun, the manufacturer of electric shavers, has used it to significantly increase production efficiency in the manufacture of functional components with particularly thin walls.

Customer: Braun / Procter & Gamble
Country: Germany
Industry: Technical injection moulding
Products: Swing bridge for razor

Improvement of weight consistency by 85 %
Challenge:

“Every day we have to prove anew that we can produce competitively in the high-wage location of Germany. Our challenge is therefore to always stay ahead technologically.”

Frank Breunig, production planner

Solution:

In order to continually increase product quality and efficiency while reducing scrap and cycle times, Braun invests continuously in new production equipment and innovative process technologies. Braun has been working successfully with iQ weight control since 2012 and has retrofitted existing machines with the software and purchased new machines with the program already installed. If deviations from the target values occur, the system reacts immediately and automatically adjusts - without affecting the cycle time - in the same shot. This compensates for process fluctuations and reliably prevents rejects.

Results:

The weight fluctuations could be reduced from 0.02 g to 0.003 g with the help of the software. This corresponds to an 85% improvement in weight constancy.

“"We are now absolutely satisfied with the reject rate of 0.047 percent. On this basis, we can reduce the effort required for quality control and thus increase the efficiency of the manufacturing process.”

Frank Breunig

- Constant moulded part weight thanks to controlled injection quantity.
- Wider range of applications for recyclates.
- Optimised visualisation on the machine control.
- Highest precision for your production.
Control, instead of flooding
iQ flow control ensures constant precision and low unit costs at BLUM

In order to combine maximum precision with efficiency in injection moulding production, innovative technologies are introduced at a particularly early stage in BLUM’s production plants worldwide. For example, BLUM was one of the first users of tie-bar-less technology 30 years ago and has also been involved in the digitalisation of production processes from the very beginning.

Customer: Blum
Country: Austria
Industry: Technical injection moulding
Products: High quality hinge, pull-out and flap systems for the furniture industry.
Challenge:

20 percent of all rejects in the injection moulding industry are caused by temperature control errors, according to Klaus Tänzler, Temperature Control Product Manager at ENGEL.

"We know that we have very good tools, but what happens in the temperature control channels was not transparent before. When faults occur, finding the cause is extremely difficult when you’re dealing with a black box."

Philip Schlattinger, process engineer

Solution:

ENGEL supplies integrated solutions for the intelligent control of temperature control processes from a single source. iQ flow control actively regulates either the flow rates or the temperature difference between supply and return in all individual circuits, thus ensuring constant process conditions. The software uses the measured values determined by the electronic temperature control water distributor e-flomo. In combination with ENGEL e-temp temperature control units, iQ flow control can also significantly increase energy efficiency. To achieve this, the speed of the pumps in the temperature control units is automatically adjusted to the actual demand.

Results:

This interaction combines temperature control consistency with very high productivity and energy efficiency. The result is maximum dimensional accuracy without rejects. By using iQ flow control, the number of cavities could be increased and the number of temperature control units reduced. As a result, the running operating costs could also be reduced.

"If we calculate across all the injection moulding machines here at the site, iQ flow control can save us a six-figure euro amount of electricity per year."

Philip Schlattinger

- ENGEL e-flomo, e-temp and iQ flow control are perfectly coordinated.
- Fewer rejects - thanks to consistent process conditions.
- Significant energy savings and reduced wear due to intelligent speed control.
Quick and accurate production overview

The shift supervisor gets an overview of 50 machines in just 15 minutes thanks to the MES TIG authentig.

BIC produces 1 billion razors annually around the clock on 160 machines from various manufacturers. At the site, the machines are grouped into business units of around 50 machines and are located in different production halls on the company premises.

- **Customer:** BIC
  - **Country:** Greece
- **Industry:** Technical injection moulding
  - **Products:** Shavers

Production overview in only 15 min
Challenge:

In the past, production logs were kept. However, with this number of machines and parameters, it is impossible to detect, document and promptly rectify all changes with this method of working. As a result, critical data and feedback from detected problems were not recorded, or were recorded inadequately. Similarly, not all adjustments made by the operator to the injection moulding parameters were passed on and were therefore not traceable. If parameters were out of tolerance or an operator error occurred, in the worst case this was only detected during quality control, so that the batch produced had to be rejected.

Solution:

In order to manufacture the razor components more efficiently, BIC decided to install the MES TIG authentic. With such large projects, it is important to divide them into phases and thus minimize the complexity. In this way, success becomes visible more quickly, the employees' confidence in the project increases and they are more motivated going into the next phase.

Results:

“TIG authentic has helped us implement new process monitoring for our injection moulding production. By using this system, we have found innovative methods to quantify problems in the production process and solve them with data-based decisions. Previously, we had to rely on our intuition and were not always right.”

Yiannis Voultzatis, Injection Moulding and Mould Maintenance Manager at BIC Violex

- Access and analysis of all machines via one central software.
- Time-saving evaluations within a few seconds.
- Live view of production-relevant key figures.
- Predictive analyses as well as measures to avoid rejects.
- Applicable for all different types of machines.
Virtual on site
Qualified remote maintenance and online support for rapid troubleshooting, around the clock and directly at your system

One of Helvoet’s end customers wanted a component to be optimised on schedule. The daily bread of a plastics processor who is used to producing highly complex components and assemblies where the interaction between mould and injection moulding machine must be pushed to the limits of what is technically feasible.

Customer: Helvoet  
Country: Niederlande  
Industry: Medical Technology  
Products: High-precision injection moulded parts for medical technology and diagnostics
Challenge:
The Corona virus threw a spanner in the works of the many people involved in this process. This threatened to topple, and the finding of results would thus have had to be postponed to an unspecified date.

"Either the project comes to a halt or we find a creative way as an alternative."

Jeroen Molenschot, Manager Development

Solution:
The fully electric ENGEL e-mac 75 injection moulding machine on which the component is produced is equipped with the e-connect.24 customer portal. This means that ENGEL technicians can access the data required to optimise the injection moulding process in real time from both Schwertberg and Houten.

Results:
The example of this target-oriented online collaboration shows what potential can still be tapped here in the future. Travel costs could be reduced to a not inconsiderable extent. The time aspect for the solution-oriented implementation and the resulting flexibility in the scheduling of a joint online meeting also prompted a rethink at Helvoet.

"We as developers must learn to use these new technologies, which are already available. If only to work more effectively and thus more cost-effectively."

Jeroen Molenschot

- Free 24/7 ENGEL online support.
- Investment usually pays for itself at the first major machine shutdown.
- Minimised downtimes due to rapid troubleshooting.
- ENGEL top experts are available online worldwide.
Use the full potential of your machine.
Get in touch with your local ENGEL contact for digital solutions now:

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