inject 4.0
Solutions for the smart factory

ENGEL
be the first
Welcome to the next dimension! with ENGEL inject 4.0

The challenges of industry 4.0 are becoming increasingly complex – while the solutions must remain simple. As an experienced and reliable partner, we at ENGEL accompany you on your path to a networked and self-optimising injection moulding production. With our inject 4.0 modules in the areas of smart machine, smart service and smart production, our customers can utilise the full potential of their production.

ENGEL delivers future-proof concepts: Our smart inject 4.0 products have already been field-proven many times and simplified the lives of thousands of customers. We are creating the injection moulding industry of the present – and also intend to shape the future with our solutions. We are therefore thinking ahead and continuing to work on new technologies that will simplify our customers’ lives.

Modular and field-proven ENGEL inject 4.0 solutions now provide you with comprehensive support for the digital transformation. You will benefit from high flexibility regarding lot sizes, increased competitiveness in the market and manageable complexity based on adaptive production and assistance systems.

We offer you the suitable technology and infrastructure for three areas that are coordinated with each other:

- **smart machine**
  Increase process stability and quality – with self-regulating systems

- **smart service**
  Maximise availability – with the help of intelligent monitoring and remote maintenance tools

- **smart production**
  Ensure high productivity – with well thought out solutions for shopfloor management
Self-regulating assistance systems for machines and robots – smart machine

Utilise the full potential of your production – from the machine, to integrated robots, to the entire machine pool. Smart assistance systems by ENGEL ensure higher process stability, better and reproducible quality, significantly fewer rejects, and optimised energy efficiency.

During production, our intelligent smart machine solutions determine the optimal production parameters, actively recommend them or simply adjust them automatically. ENGEL inject 4.0 thus provides ideal support for more and more complex production processes.

Our smart machine-solutions

- **iQ weight control** compensates for a variety of fluctuations in the production process, adapting the switch-over-point as well as the holding pressure profile to current conditions in real-time. iQ weight control thus ensures consistent parts quality.

- **iQ clamp control** Automatically detects mould breathing and optimises clamping force at the push of a button. In addition to reduced wear and tear of the mould, this successfully prevents rejects as a result of burn marks or burr-formation.

- **iQ flow control** Automatically ensures consistent and efficient temperature control processes based on the measurement results of the highly precise sensors of the e-flomo manifold system. Optimised settings reduce power consumption and decrease rejects.

- **iQ vibration control** not only detects vibration behaviour in the robot’s own movements using 3D motion sensors, but also actively compensates for vibration caused by external influences.
Intelligent monitoring- and remote maintenance tools
smart service

The goal of our smart service solutions is clearly defined: We want to maximise the availability of your system and minimise the costs of maintenance and downtime costs. Our product range includes an online customer portal, predictive maintenance solutions and monitoring of wear and tear, as well as unplanned downtime avoidance and remote maintenance service with rapid response times. If unplanned downtime does occur, fast and uncomplicated support is decisive. This is why our competent service teams are available to you around the clock. ENGEL provides you with professional and internationally available 24/7 support.

Our smart service-solutions

- **e-connect**
  The free-of-charge, location-independent customer portal provides the bundled and most current information, status data and maintenance services for all of your ENGEL Equipment. This allows you to achieve maximum system availability, more efficient processing of requests and complete documentation of systems.

- **e-connect.monitor**
  Process critical components are monitored during operation. The prediction of the remaining service life of components lets you minimise unplanned downtime, plan maintenance cycles in a timely fashion and maximise the availability of your machine pool.

- **e-connect.24**
  Worldwide online support around the clock: ENGEL’s highly qualified remote maintenance allows for rapid error correction – even directly on your machine via remote connection. Minimise downtime and save time and money!
Networking and optimisation of the machine pool

smart production

The smart production solutions by ENGEL connect various elements of your production process and provide transparency. Therefore, you can thus optimally plan your resources while increasing productivity at the same time.

We offer you different variations by ENGEL and ENGEL’s brand-independent subsidiary TIG that fit your individual requirements: Starting with machine and robot simulation, through to process monitoring and optimisation and a comprehensive MES for injection moulders, right up to Big Data analyses – we are the right partner for you.

Our product range is also highly suitable for third-party products and periphery. In case you want to network your new system with existing systems, we offer the most state-of-the-art communication interfaces and force the standardisation of data interfaces at the Euromap level.

Our smart production solutions

- **VirtMould**
  A software that simulates the production processes of ENGEL machines and robots on the computer. With the help of the visualised control unit, settings data can be adjusted and processes can be optimised VirtMould allows for the creation, editing and testing of partial data sets without utilising a machine and without risk! In addition, the simulations are an ideal training opportunity for the operation of the machine.

- **TIG authentig**
  TO ensure you have a firm hand in your production: The intelligent MES by TIG is perfect for administering data sets, optimising setup times, planning production efficiently and fulfilling documentation requirements. With its various modules, you can easily create production plans on your PC at any time or check the status and progress of production from your desk.

- **TIG 2go**
  The ideal and rapid entry into smart shopfloor management: This simple monitoring solution by the MES specialist TIG is ideal for plastics processors who do not want to invest in a complex MES solution, but do want to keep an eye on their production in the best possible way. TIG 2go runs in the TIG cloud, independent of the operator’s IT infrastructure. Using simple hardware components, any machine in the world can be connected with the highest level of security via standard interfaces.

- **TIG big data**
  Your worldwide production sites connected in a central cockpit: TIG big data is a high-performance analysis framework provides companies with the opportunity to connect and analyse data from any database, such as those available in MES-, ERP-, CAQ- and maintenance systems. The data are subsequently bundled and processed in this platform.
Our contribution to your smart factory: Cross-system communication

Inject 4.0 combines the advantages of smart machine, smart production and smart service and is the basis for your smart production. With the help of horizontal and vertical data integration, each inject 4.0 module can contribute to your smart factory. Our horizontal data integration allows for “plug & produce”-capable production systems, into which additional ENGEL systems or periphery devices can be integrated more easily than ever before. The result of vertical data integration is maximum transparency along the entire production process and a never before achieved data basis as the foundation for analyses and decisions.

Reaching the next dimension together

The plastics industry is in the midst of a change that affects the business models of providers as well as operators. It is our goal to actively help shape the industrial standards of a digitally networked production. As a partner in the Adamos joint venture, we are part of a strategic alliance of leading mechanical engineering companies for the topics of the future: Industry 4.0 and Industrial Internet of Things (IIoT).

ENGEL is the right partner for the digital transformation of your production: We set up a digital platform for you and customise it precisely to your requirements. All the participants in the value chain benefit from a central marketplace containing all relevant data and information. Transparency and networking make your company more flexible in regard to changing requirements, more competitive as compared to the competition and therefore sustainably successful. Benefit from the networking effects, increase the efficiency of your production and reduce costs – with cross-system communication by ENGEL!
State-of-the-art security standards for secure operations

We are in the midst of the digital transformation of our industry, which brings with it many challenges as well as enormous potential. The comprehensive connection and networking of technologies and associated business processes means that we are facing important challenges regarding topics such as data security. ENGEL fulfills state-of-the-art security standards in all of its solutions and relies on unified, secure and service-oriented communication interfaces such as OPC-UA – allowing you to rely on smooth and secure operations.

Protection and transparency to the last bit

With ENGEL, your data are in the best hands: The system architecture fulfills the highest security standards and sets new standards in regard to data protection. Your data are protected by corresponding authorization systems. The regular backup of data within the cloud architecture goes without saying. Only hardened operating systems are used to operate the ENGEL EDGE device. All systems used are subject to stringent security tests and you determine which data are transmitted – access is limited to persons authorised by you.
inject 4.0
success stories

Geberit
European market leader for sanitary engineering increases efficiency and quality with the MES solution by TIG.

"Thanks to the MES solution, there are very many individual factors with which we increase the overall efficiency of our production. It is a continuous process. In the plastics industry today, the implementation of a MES alone no longer provides a competitive advantage. The deciding factor is how well one manages to use the opportunities provided by the system."

Michael Höchtl, Process Technician
Geberit Produktions GmbH & Co. KG

Huf
ENGEL e-connect.24 ensures automotive supplier of highest system availability worldwide.

"With this project, we see how the new solutions are not only helping us to reduce our travel times, but above all, to manufacture more productively and better. All of this significantly strengthens our competitiveness. We are already planning further Industry 4.0 projects with ENGEL."

Dirk Horn, Position Corporate Process Technology
Huf Hülsbeck & Fürst GmbH & Co. KG

Braun
The manufacturer of electric razors uses ENGEL iQ weight control to lower the reject rate by more than 50%.

"The results of the test series are unambiguous and reproducible. We are now totally satisfied with the reject rate of 0.047 percent. Based on this, we have been able to reduce the quality control overhead, and thus improve the efficiency of the manufacturing process."

Frank Breunig,
Procter & Gamble Manufacturing GmbH,
Braun Werk Walldürn