

e-factory



ENGEL
be the first.



Transparency means efficiency.
ENGEL e-factory.

ENGEL e-factory – Overview of benefits:

- > **Faster recognition and reaction, productivity and quality boost:**
Deviations from the desired status and fluctuations in quality are clearly visualised in real time
- > **Shorter set-up and standstill times** due to fast and reliable transfer of configuration data from computer to machine
- > **Easy detection and remedy of errors:** Malfunction reports with an evaluation of causes and remote maintenance improve machine utilisation
- > **Monitoring and improvement of processes** thanks to documented and reproducible changes
- > **Fulfilment of the documentation requirement**, e.g. as in the automotive or medical sector
- > **Improved planning:** Selective access to stored information for efficient machine and personnel planning

Production sequences become transparent. At the push of a button. In real time. Conveniently from the desktop. With the comprehensive ENGEL e-factory software solution. The system collects the data from your injection moulding machines down to the last detail. You will have even faster access to the key details of your production. That includes when things are not running as they should. Draw conclusions concerning the susceptibility to failure, utilisation and productivity of your machines. And see where to start making further improvements. With ENGEL e-factory.

The monitoring system for production

Greater efficiency and transparency for your injection moulding production. This ENGEL e-factory software solution makes it possible. With a series of well-conceived and perfectly synchronised modules, the system logs operating and machine data centrally and clearly, and manages the configuration data for ENGEL injection moulding machines. ENGEL e-factory is thus an ideal monitoring and management tool for your injection moulding production. And it creates an efficient link between injection moulding machines and company IT.

ENGEL e-factory enables you to transfer all mould-related settings and operational data, as well as current process values and operating data, to PC workstations where they are visualised, evaluated and managed. Moreover, the system provides the data in a form that can easily be processed by your in-house applications - e.g. for recording and documenting your parts production or further statistical evaluations.

Connected to the ENGEL service world At the push of a button

ENGEL e-factory connects your production to the global ENGEL service network: Your direct line to over 300 ENGEL engineers offering fast and competent online help, guaranteeing maximum availability of your machines.

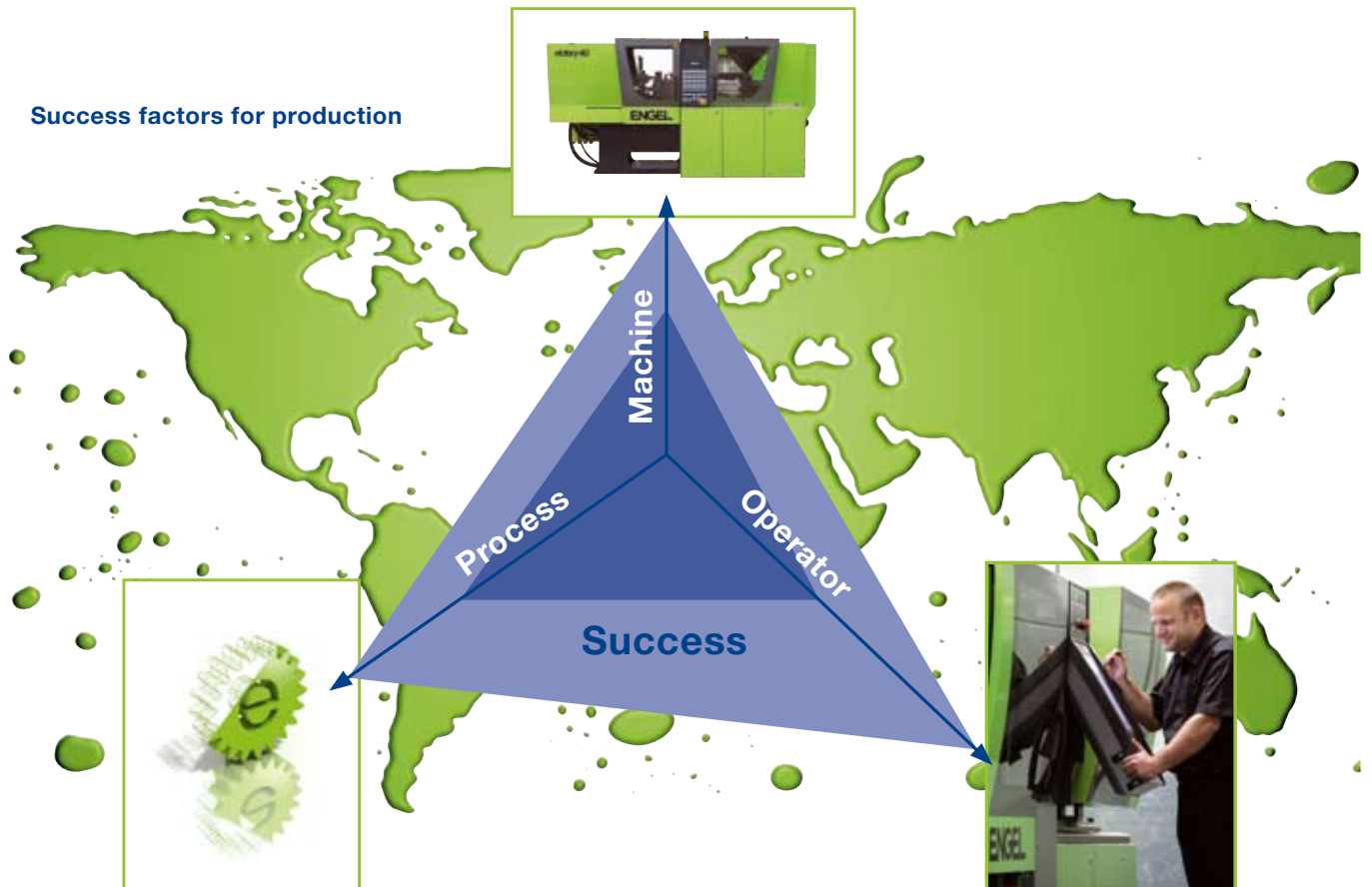
ENGEL e-factory

The system was first introduced in the mid-1990s as the Engel Monitoring System (EMS), then enhanced and systematically improved in several innovative steps. Today the system is perfectly equipped for the increasingly complex tasks in modern injection moulding production. The ENGEL e-factory is being used successfully by a large number of enterprises worldwide to increase efficiency and transparency in production.

The path to the “digital factory“

Transparency is the prerequisite for the configuration and optimisation of all processes. The production process is mapped, networked and simulated from a data processing point of view by the so-called “digital factory” method. The objective is to constantly monitor the entire manufacturing chain, identify weak points and permanently optimise workflows. The result is substantially reduced costs and improved quality of parts. With its modules, the ENGEL e-factory provides the elementary functional basis for integrated production within the context of the “digital factory”.

Success factors for production



Three main factors determine the success of your production: machine, operator and process. The basic prerequisite for functioning production is the injection moulding machine. Besides top technical performance, what counts here is a high level of availability. This is ensured by regular maintenance to prevent unexpected breakdowns, combined with a fast and comprehensive spare parts service that is quickly on site in the case of emergency.

However, the full potential of the machine cannot be exploited without trained operators. The third deciding factor is the processes. Cost-effective production can only be achieved if there is perfect interaction between the operator and the machine. This is where ENGEL e-factory provides comprehensive support. The system makes your production sequences transparent. And provides the tools to recognise weak points quickly and systematically, allowing you to constantly improve your processes.

ENGEL e-factory. Production overview

ENGEL e-factory.Access

The gateway to the machine

You receive access to the machine data via the standard Euromap 63 protocol. ENGEL e-factory.Access provides a uniform data interface over all control generations for your company's IT.

ENGEL e-factory.Data

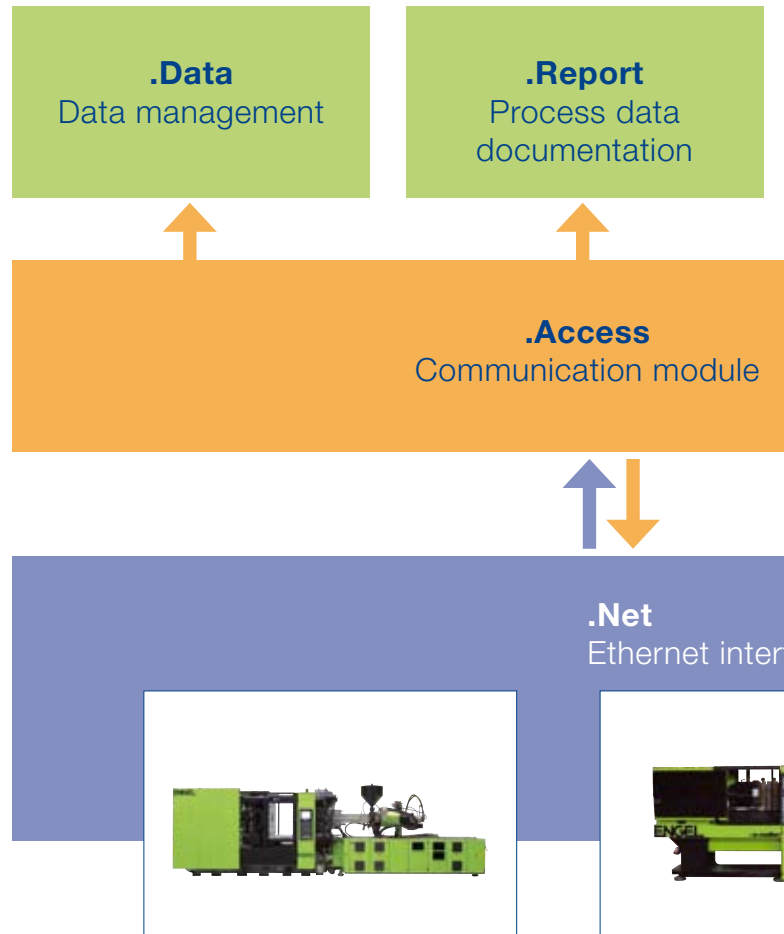
Setting data management

This module manages the setting data for your machines. Data sets are transferred to and from machines and can be processed in this program. This module is also available as an offline variant without direct connection to the machines.

ENGEL e-factory.Report

Process data documentation

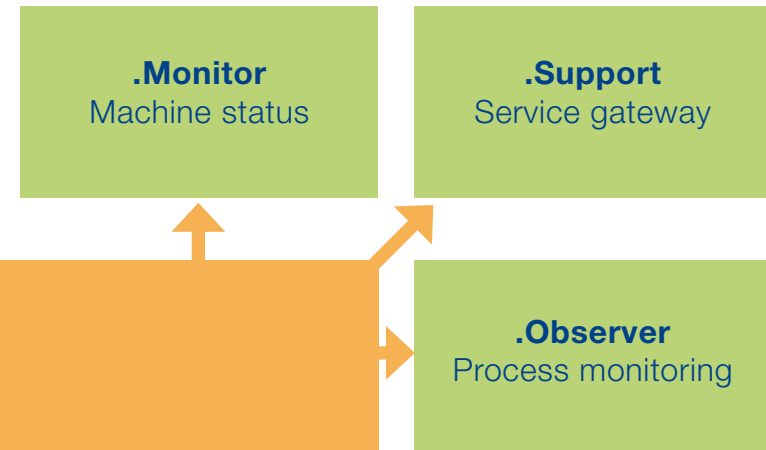
Process data from your production is recorded and displayed. ENGEL e-factory.Report assists you in fulfilling the production documentation requirement vis-à-vis customers and maintaining production quality.



ENGEL e-factory.Net

Prerequisite

Machines and computers are connected via the proven Ethernet network. e-factory.Net equips machines of all generations with the required interface. Newer control units already have this as an integral standard.



ENGEL e-factory.Monitor
Machine status

The status of your machines at a glance. Instantaneous information on the status of your production will help you detect malfunctions at an early stage and enable you to react immediately to production failures, thus saving unnecessary costs.

ENGEL e-factory.Support
The Service gateway

This comprehensive remote service solution gives you access to the ENGEL global service network. ENGEL experts from subsidiaries and plants worldwide are at your disposal online. Fast online help guarantees the highest level of machine availability.

ENGEL e-factory.Observer
Intelligent process monitoring

Stability recognition for the injection moulding process merges all essential information from the process-relevant parameters to a single figure - process stability. This figure enables rapid responses to quality fluctuations.





ordered

ENGEL e-factory.Data Setting data management

ENGEL e-factory.Data enables efficient, centralised organisation of parts data sets for your machines. With rigid centralised data management you will ensure that only verified parts data sets are used, thus avoiding quality fluctuations due to unauthorised changes in configuration data.

The main mask of ENGEL e-factory.Data is divided into three areas.

- **Desktop** for processing and transferring parts data sets.
- **Archive** for the storage of data sets with change history
- **Machine** view for online viewing of parts data

Fast identification of data sets

In these areas the parts data sets are displayed in an individually configurable tree view. All three areas display a helpful brief description with further details of the selected data set or machine. This enables quick identification of the selected data set.



ENGEL e-factory.Data

Overview of major features

- > Management, maintenance, archiving and documentation of parts data sets
- > Transmission of parts data sets to and from the machine
- > Comparison, import and export of parts data sets
- > Recording of changes in set values in online operation
- > Display of parts data sets with the original screen masks

In these areas the parts data sets are displayed in an individually configurable tree view. All three areas also contain an overview with further details of the selected data set or machine. This enables quick identification of the selected data set.

Focus on data security

The main purpose of separation into these three areas is to protect the archived data sets. Machine settings data can thus only be written in the desktop area. It can only be imported into the archive after release by authorised users. This ensures that only verified data sets are stored in the archive. This makes a major contribution to quality assurance, as new orders can only be started with verified and secured data sets.

Machine settings data from the archive, desktop and machine view are displayed with the same screen masks as on the machine itself and can also be modified. Efficient user administration ensures that changes can only be performed by authorised persons.

Version changes – transparent at all times

The archive has been conceived for long-term storage of data sets and also provides simple version administration. Comparison of the different versions of a data set enables changes to be precisely traced. Parts data sets for transfer to and from the machine are provided on the desktop.

With the export function, data sets can be transferred to and from the machine not only online, but also via an external data medium (e.g. USB memory stick). A history of changes in set values performed on the machine is displayed in the machine view.

ENGEL e-factory.Data

Overview of benefits

Shorter set-up times

The online transfer of configuration data to the machine is faster and more reliable. In addition, preparations can be made conveniently on a PC without impeding production.

High level of data security

The search for the right data medium with an appropriate data set is a thing of the past.

Data availability

Central archiving of parts data sets prevents loss of critical production data and ensures that they are available in the long term.

Process optimisation

Changes are documented and can be traced. Simultaneously, a valuable knowledge database is established.

Improved quality

The right data is always available for set-up, commissioning and production. That means time savings, quick production go-ahead, less rejects and improved quality.



ENGEL e-factory.Report Process data documentation

ENGEL e-factory brings transparency to your production process and makes a major contribution to quality assurance. It cyclically records all the relevant process parameters such as pressures, speeds and temperature profiles and keeps them ready for future display or statistical evaluations. The simply designed user interface promotes efficient use of this tool without elaborate training.





ENGEL e-factory.Report Overview of major features

- > Complete documentation of process data in one database
- > Graphic or tabular display of data
- > Data display in real time or historical
- > Simple statistical functions
- > Data export

Statistics under control

Statistical evaluations are possible using the mean value, variance, minimum and maximum value functions. By determining machine capability, ENGEL e-factory permits process evaluation.

Specific in-house evaluations are possible with standard tools, e.g. Excel, as ENGEL e-factory.Report offers various export functions for the recorded data. All these functions can be used on real time data from current production or on historical data from earlier production orders. These extensive evaluation options permit extremely transparent assessment of manufacturing quality and the cost-effectiveness of a production order

Documentation requirement fulfilled

Moreover, recording this process data in a database goes a long way to fulfilling the documentation requirement vis-à-vis your customer. This type of requirement often applies to the automotive and medical technology sectors. The documentation of process data is in turn the prerequisite for certification of your production according to international quality standards.

ENGEL e-factory.Report Overview of benefits

Process evaluation

The numerous data evaluation options generate useful indicators and informative statistics for the evaluation of production processes.

Quality control

Ongoing recording of process parameters enables continuous assessment and control of production quality.

Process data documentation

With seamless recording and long-term storage of all relevant process parameters, you are satisfying the documentation requirements vis-à-vis your customers.



overview

ENGEL e-factory.Monitor Machine status

Record the status of the entire production at a glance – ENGEL e-factory.Monitor makes this possible thanks to clearly arranged displays. All connected machines can be displayed in one or more freely configurable shop layouts. Colour codes provide information on the status of each individual machine. If required, you can additionally display critical process parameters for each machine. Furthermore, information relating to the individual machines can be seen directly on the screen pages – without going to the machine.

React fast and save costs

Instantaneous information on the status of your production will help you detect malfunctions at an early stage and enable you to react immediately to production failures, thus saving unnecessary costs.

Minimum rejects. Maximum quality

The optional min./max. monitoring keeps track of all quality-determining process parameters at a central point for all machines during production. A deviation in these values from the set ideal range is notified immediately, thus preventing unnecessary rejects. In this way, min./max. monitoring guarantees the quality of the manufactured parts and cuts costs by avoiding rejects.



ENGEL e-factory.Monitor Overview of major features

- > Display of machines and shop layouts
- > Symbolic display of machine statistics
- > Display of current alarms and process data
- > Display of alarm history and reasons for standstills
- > Evaluation of reasons for standstills
- > Min/max monitoring of process data (optional)
- > Production efficiency calculation (optional)
- > Machine alarms with E-mail notification (optional)

Getting to the root of the problem

On the basis of the alarm history and standstill reasons of individual machines, ENGEL e-factory.Monitor will pinpoint the causes of malfunctions. Errors and weak points can be quickly and systematically analysed. That helps to further optimise your production processes.

The optional production efficiency calculation will assist you – depending on requirements – in calculating the efficiency of a machine or production order. This feature is also an essential prerequisite for ongoing process optimisation.

SMS alert

Machine malfunctions must be quickly repaired. Nevertheless, qualified operating and maintenance personnel does not need to be available around the clock. Optional e-mail alert ensures that the staff responsible is automatically notified the moment certain alarms are triggered on the machines. With an SMS gateway you can redirect this alert directly to your mobile telephone. This ensures minimum downtimes and saves unnecessary costs.

ENGEL e-factory.Monitor Overview of benefits

High production efficiency

The informative machine status display draws immediate attention to irregularities, enabling fast intervention.

Reduced standstill times

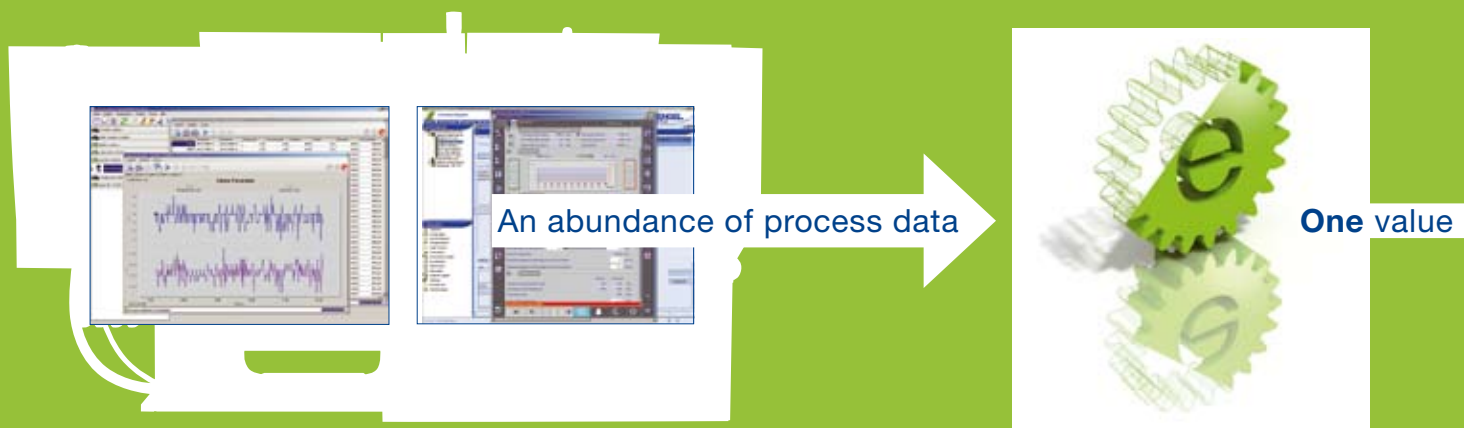
In the case of a malfunction, the automatic alarm passes the information instantaneously to your maintenance staff.

Consistent production quality

The min./max. monitoring recognises quality fluctuations at an early stage.

Process optimisation

The analysis of production efficiency and causes of standstill helps to diagnose problems and forms a basis for optimised production processes.



ENGEL e-factory.Observer Intelligent process monitoring

Full concentration on one parameter:

Process stability

Injection moulding machines record shot-by-shot a wide range of useful process data (actual values). However, the operator is often unable to manage this flood of process data – the information is not used. This is where ENGEL e-factory. Observer comes into play. It is a stability recognition system for the injection moulding process. The software merges all essential information from the process-relevant parameters to a single figure - process stability. This figure between 0 and 100% tells the operator whether the process is running evenly or if the process conditions are currently changing. The system can recognise a wide range of disturbances (e.g. fluctuations in humidity, failure of temperature control circuits) at an early stage.



ENGEL e-factory.Observer Overview of major features

- > Monitoring of relevant process parameters
- > Reduction of the flood of process data to a stability rate
- > Automatic adjustment to differing process conditions
- > Stability information available directly on the machine
- > Data archiving and subsequent analysis possible

Minimum expense. Maximum flexibility

In contrast to the usual monitoring functions, the operator must not specify any limit or tolerance values with the ENGEL e-factory.Observer. The software learns independently from the observed values and can automatically detect changes in the process conditions. Although no direct read-out of moulded part quality is possible, it will deliver a warning of process or quality fluctuations. The benefits are obvious: Because ENGEL e-factory.Observer has no specific limit values, the software can adapt to new conditions, combining high flexibility with minimum configuration effort.

In addition to the real time display in ENGEL e-factory.Monitor or on the machine screen, the stability values are archived together with the process data in a separate file which can be used later for analysis. Process stability can, for example, be assessed at a glance during the last production day. In the event of quality problems, the recorded stability and process data can greatly facilitate causal research.

On machines incorporating the newer generation of control units, an additional screen is available as an option in which the stability values are displayed on the machine in graphic and tabular form.

ENGEL e-factory.Observer Overview of benefits

Consistently high quality

A stable process is the prerequisite for consistent quality. ENGEL e-factory.Observer offers an intelligent stability evaluation which takes in the entire injection moulding process.

Simple operation and application

Process stability is expressed in a single figure. Minimum configuration effort is required and the program adapts flexibly to changing process conditions.

Early detection of malfunctions

A deterioration in part quality can frequently be recognised in advance by fluctuating process stability. ENGEL e-factory.Observer identifies the process data responsible for process fluctuations and facilitates the search for the cause.

Assessment of start-up performance

There can be relatively sharp fluctuations in quality characteristics, particularly upon start-up after a production stoppage. The stability rate here is a good indicator for when the process – and thus the part quality – is back in balance.



ENGEL e-factory.Support The Service gateway

ENGEL's excellent service competence is a central argument in favour of choosing ENGEL machines and turn-key systems. ENGEL gives you reliable support thanks to more than 300 service engineers worldwide and a well thought-out tel-service solution, like e-factory.Support. This is your hotline to service engineers at our facilities and experts at ENGEL's manufacturing works.

Upon receiving a request, an ENGEL employee can log on to your machine and immediately troubleshoot the problem. This ensures a high quality of diagnosis and analysis, keeping your standstill times as short as possible. A variety of analysis tools furnish the necessary functionality and provide ENGEL expert „on site“ knowledge from our subsidiaries and plants.

Analysis tool

The analysis tool has functions that help to analyse errors in the shortest possible time. All the data required for analysis - such as status reports, or measuring results - are available within just a few minutes. Real-time access to ENGEL machine screens indicates the current machine status. And software updates can be quickly and safely installed.

Conference Center

Audio, video and text conferences from the Conference Center provide a quick and easily understandable method of passing on instructions and explanations by ENGEL service employees – even if the participants are thousands of kilometres apart. Features such as document sharing and redlining tools are a great help.

Documentation management

The documentation management is responsible for providing well-organised and up-to-date documentation. Documents such as manuals and company-internal guidelines can be neatly archived for quick and easy retrieval at any time. Your major benefit is that your ENGEL machine manuals are kept up to date, if so desired.



ENGEL e-factory.Support Overview of major features

- > Analysis functions: Status reports, measurement data, software updates
- > Support tools: Remote view, remote desktop, file transfer, VNC conference
- > Conference Center: Audio and video conferencing, document sharing, redlining tool, chat
- > Log book: Service lifecycle
- > Document management: ENGEL documents, customer documents, automatic document updating
- > Maintenance manager: Time- and performance-related service intervals, description of service work, automatic updating of servicing instructions

Logbook

The logbook manages all service events in a clear and comprehensible manner. Entries can be assigned to different areas, e.g. maintenance and repairs, and indicate the activities performed on the selected machines at any given time. A service lifecycle is thus created for each machine.

Maintenance manager

Preventive and regular maintenance ensures a high level of machine availability and part quality. The optional Maintenance manager keeps track of all your service intervals and automatically reminds you of upcoming maintenance needs. The criteria for scheduling this work can be set to be time or workload driven. Changes to maintenance requirements are automatically propagated to your machine by ENGEL whenever required. You can store descriptions of activities and tools, and any other documents, for each maintenance task. To provide a clearer overview, activities are assigned to different faculties. Controlled maintenance guarantees lower life-cycle costs.

ENGEL e-factory.Support Overview of benefits

Short response times

Upon submitting a request you will receive online support.

Competence sharing between plants

If your company has production facilities at a number of different locations, you can also use ENGEL e-factory.Support as an efficient, internal communications platform for your service and maintenance requirements. The service solution also supports the exchange of case histories and information between your production facilities.

ENGEL expert knowledge on site

e-factory.Support connects you to the experts at your nearest subsidiary or our Austrian head office.

Reliable and easy software update process

The update can be uploaded directly to your ENGEL e-factory server and polled by your machine.

Maximum IT security

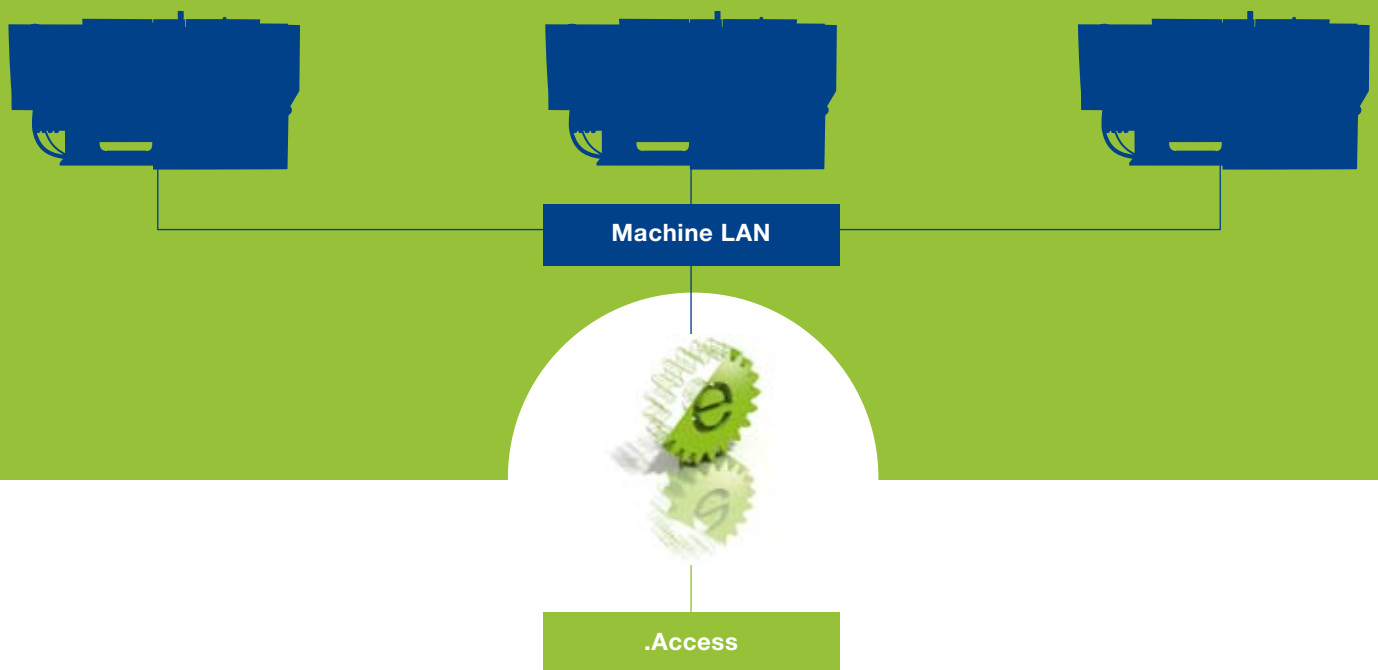
ENGEL e-factory.Support is certified as a TÜV IT "Trusted Product". This guarantees maximum IT security standards.

A close-up photograph of a green printed circuit board (PCB) with intricate white and yellow circuit traces and several circular components. The image is used as a background for the top half of the page.

connect

ENGEL e-factory.Access The gateway to the machine

The ENGEL e-factory.Access module supplies machine data via a central data interface conforming to Euromap 63 for further processing on the PC or in the company network. Euromap 63 is an international agreement between the manufacturers of injection moulding machines to standardise machine data on the PC. (For more information visit www.euromap.org).



Standard data interface

The development of different generations of control units over a period of decades has resulted in a wide range of communication protocols. ENGEL e-factory.Access can handle all these protocols and provides a standard data interface over all control generations. Machine parameters can be accessed directly via the data interface by simple means such as a standard text editor. This permits, for example, connection to the MES systems of third-party vendors. ENGEL e-factory.Access can also be used as an interface for a data link to ERP systems.

Well looked after – Support by ENGEL experts

ENGEL will be pleased to assist you in connecting this type of system to ENGEL e-factory.Access. As part of the partner consulting system, ENGEL offers a comprehensive training program and accompanying support during the implementation phase.



Series

ENGEL victory
ENGEL e-motion
ENGEL e-max
ENGEL duo
ENGEL speed
ENGEL combimelt
ENGEL insert
ENGEL elast / LIM
ENGEL PETsystems

Integrative technology

ENGEL robot
ENGEL control

Services

ENGEL training
> ENGEL e-factory

Application technology

ENGEL application technology

Industry sectors

ENGEL automotive
ENGEL teletronics
ENGEL packaging
ENGEL medical
ENGEL technical moulding

Summary

ENGEL portfolio

Language

german
> english
french
italian
spanish

ENGEL
be the first.