

be the first.



>> The best way to predict the future
is to invent it. << Alan Kay (computer and internet pioneer)
be the first.

Small and medium-sized machines

ENGEL VICTORY
ENGEL E-MOTION

Large-capacity machines

ENGEL DUO / CLASSIC

Special applications

ENGEL COMBIMELT
ENGEL INSERT
ENGEL ELAST / LIM
ENGEL macPET

Integrative technology

ENGEL ROBOTS
ENGEL PRECISION MOULDS
ENGEL CC 200

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Application technology

ENGEL APPLICATION TECHNOLOGY
Foammelt, Fluidmelt
Tecomelt, Fibermelt

Services

ENGEL TRAINING

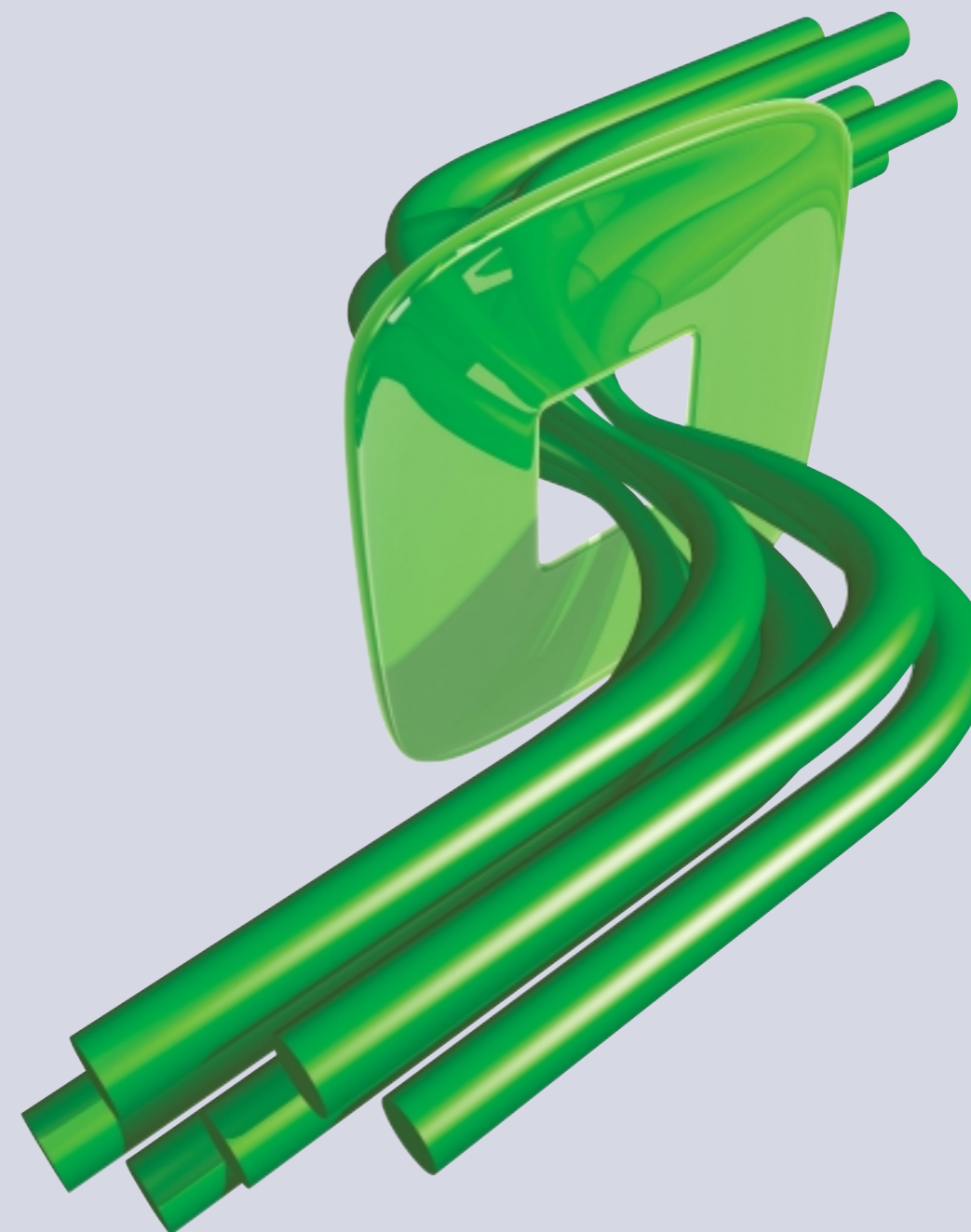
Summary

ENGEL SCOPE OF PRODUCTS

Language

german
english
french
italian
spanish

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ENGEL

ENGEL

CC 200

ENGEL CC 200.
The new standard for machine and robot.

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	Minicam, protective coverings...		Image scroll UP (not activated)
	Close mould		Back to previously chosen function
	Open mould		Cycle time, weekly time switch
	Ejector		Quality assurance programs
	Core puller		Production programs
	Injection		Assistants
	Holding pressure		Print
	Metering		Set-up
	Nozzle		Help
	Heaters		Trouble-shooting page
	Micrograf		Image scroll DOWN (not activated)
	Changeover Machine / Robot		
Known functions		New possible functions	

A well-proven basic system – now with a wider scope of possible functions. Entirely in keeping with Engel's philosophy of continual development, the well-proven features of the existing machine control system have been incorporated in the new control concept and complemented by an intuitive touch screen interface.

Using the familiar softkeys – now arranged in two vertical bars on the right and left edges of the touch screen – the operator can now directly select the machine functions and assistant programs.



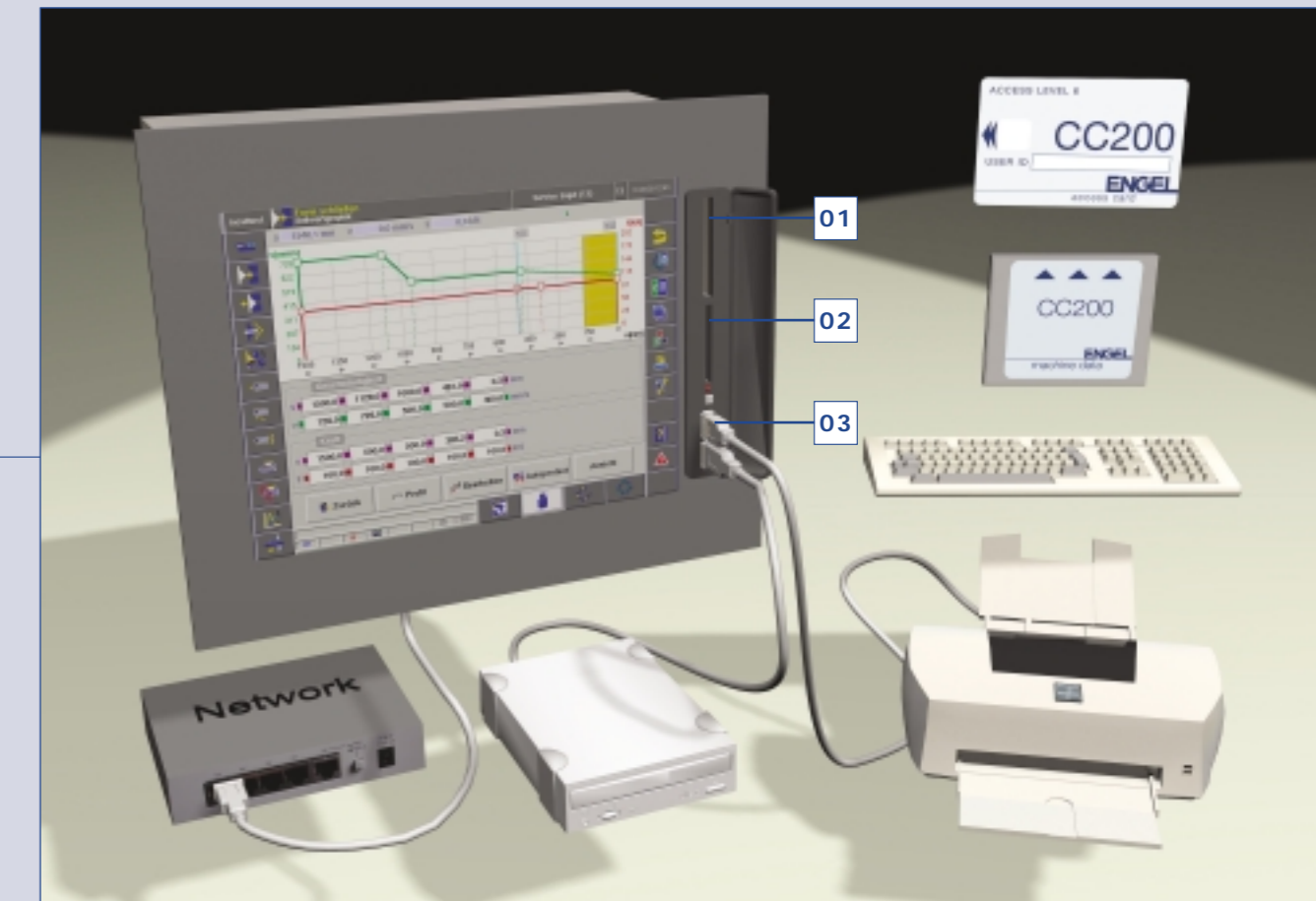
Multifunctional screen:
Central operating and display panel for functions and program data featuring full touch-screen capabilities

High computing capacity combined with familiar operating logic:
Control panel computer with 12.1 inch TFT colour monitor and touch screen interface.

The operating logic has been taken over from the CC 100 system (quick-selection keys for basic functions and changeover to robot program – see left-hand symbols) and extended by additional functions for service, quality assurance and data exchange with peripherals. The same operating logic is used for both machine and robot, thus reducing setting-up times considerably.

Symbol keys:
For equipment options

System switch:
For control voltage, motor start-up, mould heating, program start and emergency OFF function



01
Data input medium, communication:
1 off Compact flash slot, front side, for use with flash cards as writing/reading media for part data, machine data and data recording.

1 off Compact flash slot, rear side – equipped with a 32 MB memory as standard. Can store up to 600 sets of mould data and process records. Storage capacity is 20 times that of the preceding model CC 100, which used diskettes as input media.

2 off SIM card carriers

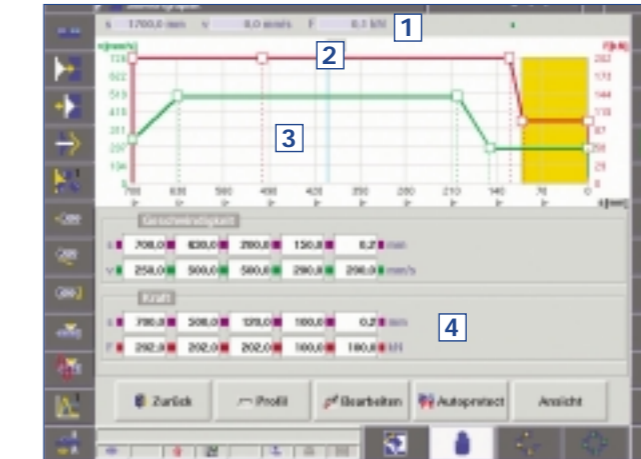
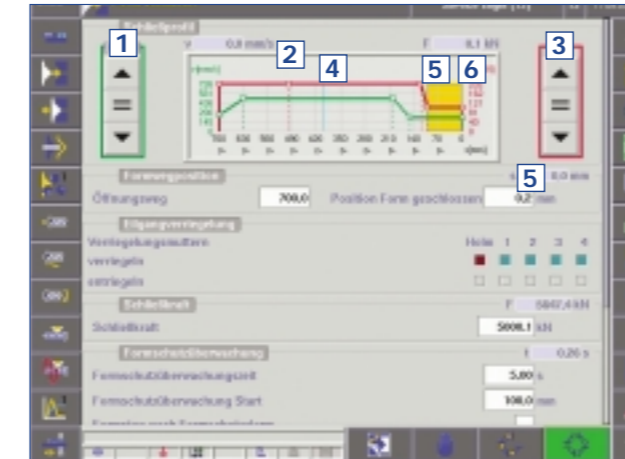
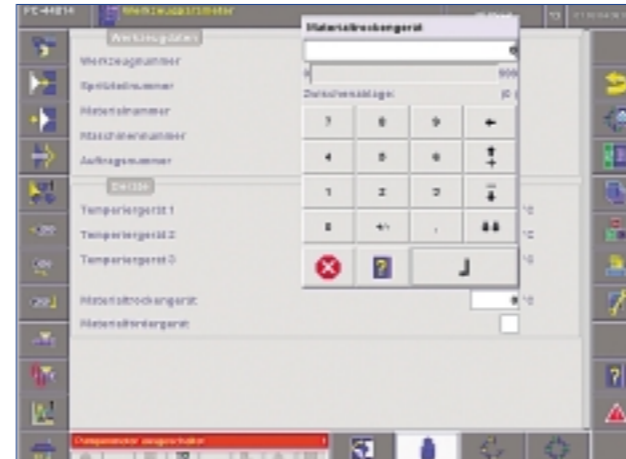
02
Selective access system:
1 off Chipcard reader, front side. The chipcard is the "ignition key" for the machine operating system. As many as 15 privileged access levels can be selected for different personnel – from machine operators through to servicing technicians. This facility ensures, for example, that only appropriately trained operating personnel can effect program changes

03
Data exchange:
2 off USB ports, front side, for external equipment (e.g. printer, CD-ROM etc.)
2 off USB ports, rear side
1 off Ethernet interface

ENGEL CC 200.
The highlights: Speed – Precision – Flexibility.

ENGEL CC 200.
Combining tradition with state-of-the-art.

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- > Easy operation and rapid familiarization thanks to incorporation of existing Engel control system features in the new graphics package.
- > Faster programming of machine and robot on the basis of standard operating sequences.
- > The option for offline programming on an external PC equipped with the same software as the machine offers the potential for minimizing the machine set up times.
- > Highest flexibility through a high number of program modules and adjustable precision.
- > Modern hardware concept with central high-capacity control panel computer linked with modular computer hardware – open ended – without any restrictions through pre-configured rack system.
- > More reliable performance through reduction in number of components.
- > Universal system: One single concept for machine and robot which can be adapted to all operating and performance conditions.
- > Standard interfaces for connection to networks offers potential for remote maintenance and active communications with service points.
- > Reduction of response time in the event of a machine downtime through automatic notification of repair and maintenance personnel by e-mail.

- 1 Proportional speed adjustment keys (green)
- 2 Graphic function display for speed and force / pressure profile
- 3 Proportional force / pressure adjustment keys (red)
- 4 Bar indicating start / stop position (light blue)
- 5 Bar indicating actual position (dark blue) and digital display
- 6 Mould safety monitoring window (yellow)

- 1 Status line
- 2 Graphic function display for speed and force profile
- 3 Bar indicating actual value (dark blue); can be switched on / off in the menu [View]
- 4 Digital settings for speed (green) and force (red) with respective changeover points (magenta); this table can be switched on / off in the menu [View]

- 1 Digital coordinate display of selected point
- 2 Selected point
- 3 Profile preview
- 4 Changeover from point to line shifting mode
- 5 Changeover to another profile

Ease of operation thanks to graphics user interface.

Fast and intuitive operation was the prime objective which the designers of the new generation of Engel control systems set themselves. Familiar control functions have been retained. These can be initiated via soft keys clearly arranged in groups on the edge of the screen.

The central area of the screen is reserved for the selection and input of individual process functions. The touch screen permits both the direct adjustment of graphic function displays and the conventional input of alphanumeric data.

The machine and the robot can both be operated in exactly the same way.

Setting option 1:
Rapid setting by means of adjustment keys.

For certain machine functions, the central area of the screen is provided with rapid adjustment keys located on both sides of the graphic function display. These keys enable the operator to raise or lower the standardized function profiles proportionally. The changed function profile (e.g. max. speed) is then inputted by means of the "=" key.

Setting option 2:
Digital settings.

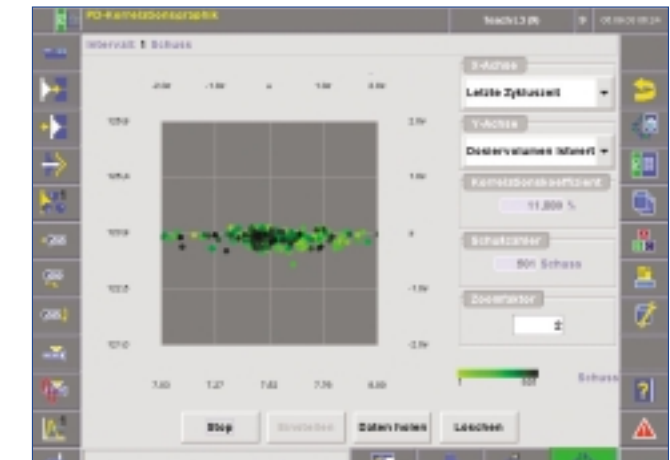
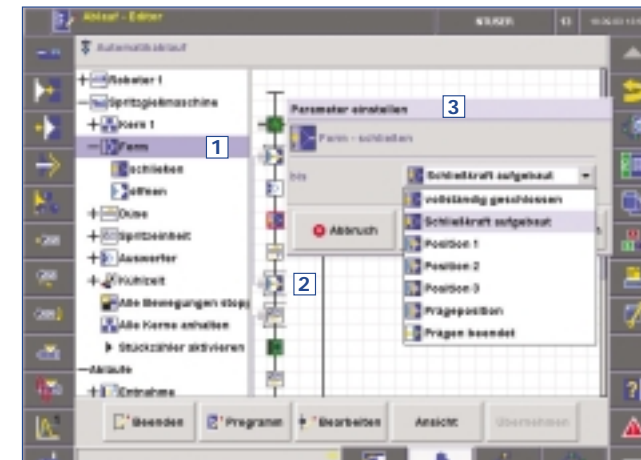
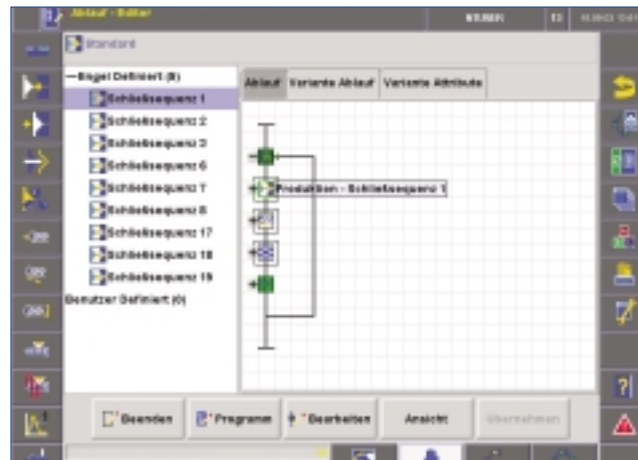
The operator must first tap on the graphic function display with his finger. This opens up a new graphic function display with input windows for numerical settings (as on the CC 100 control system). The settings for the new profile can now be inputted. The new profile appears simultaneously in the graphic function display.

Setting option 3:
Setting the profile by shifting points and lines.

The operator must first tap the graphic function display with his finger repeatedly in order to enlarge it. The profile can now be shifted manually by means of the operator's fingertip or a touch pen without any need to enter the required settings numerically. The operator can also choose between point and line shifting mode.

ENGEL CC 200.
Complex sequences easily programmed.

Quality evaluation at a single glance.



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Both a fixed standard sequence program and a free programming option were already featured on the CC 100. These were adequate for the majority of applications without any need for additional software.

New feature on the CC 200:
Sequence Editor.

The Sequence Editor is a tool which permits the modular pre-configuration of operating sequences. Each individual sequence has its own symbol. The complete cycle sequence can be pre-configured step-by-step simply by stringing together the individual sequence symbols in the form of a flow chart. The Sequence Editor can be used for both machine and robot sequences.

Using the Sequence Editor for standard sequences.

With this application, the complete cycle sequence is pre-configured from partial sequences, e.g. closing, injection, opening and cooling sequences as well as other sequences for robot integration. Additional, requirement-specific sequences may also be incorporated. The particular advantages for the operator lie in the clarity of overview and ease of adaptability.

Using the Sequence Editor for individual machine movements.

When a specific operating sequence is selected, the available machine and robot functions appear in the selection display (left-hand half of screen). Shown next to the selection display, to the right, is the automatic cycle, either just with symbols or with symbols and explanatory texts. The addition of a function, e.g. "Retract core", is done by first selecting the function in the selection tree (1) and then inserting it into the sequence by tapping on the desired position in the automatic cycle (2). When the symbol has been inserted, the operator then immediately inputs all relevant parameters, such as speed, force and, where applicable, intermediate stopping positions (3). This facility is particularly useful for production start-up, as functions can be activated/deactivated without having to delete them from the sequence.

Process data graph, statistical and correlation analysis.

This program module permits the simultaneous recording of several process parameters in the form of a graph and the clear analysis of correlated and scattered data. By tapping on the legend panel of the graph, the operator obtains information – in the line above the graph – on the correlation between the selected curve and the curves for the other recorded parameters. This information is given as a percentage indicating the degree and trend (positive or negative) of correlation.

Correlation graph.

The correlation graph permits the representation and consequential analysis of the correlation between two selectable process parameters for the duration of a definable number of cycles. It serves, for example, as a means of clearly visualizing and identifying the possible causes of process instability.

ENGEL CC 200.
Off-line programming reduces setting-up times.



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Increased efficiency thanks to off-line programming facility.

Sequence programming may be performed directly on the machine as part of the setting-up process – this is the traditional procedure – or on an external PC equipped with the same software as the machine. This reduces setting-up times and, by the same token, machine downtimes.

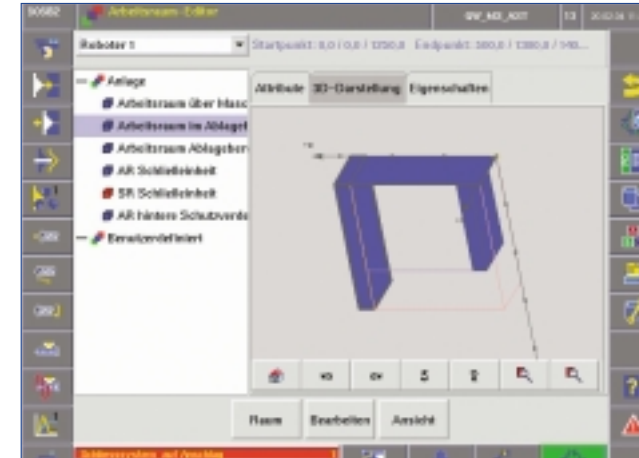
This increase in efficiency has been made possible by a complete renewal of the basic system and, in particular, by the use of new programming languages: IEC for machine and robot and Sun/JAVA for visualization. These were the prerequisites for using machine programs on normal PCs equipped with Windows software.

Process visualization is thus possible on any PC anywhere in the world, via either the Intranet or the Internet

The network interfaces.

- Internet interface:
using communication protocols TCP / IP, integrable in both the Internet and the Intranet.
- Remote maintenance:
service and user support via the Internet (chat window).
- E-mail (SIM card):
automatic mailing of status report (e.g. in case of malfunction).
- Interface for PDA systems, data bases and expert systems
(The control may serve as the operating station for these functions).

Optimum reliability: same operating system for the robot – and complete with help system.



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CC 200 robot control.

Simply by actuating one of the basic function keys on the screen, the operator can switch over the control system from the user interface for the machine to the user interface for the robot. The logical system configuration is the same. The operator has the same basic functions (left-hand vertical key bar) and additional functions at his disposal. The three-dimensional robot movements constitute the central parameters for the graphic function display concept.

CC 200 / help system.

The CC 200 machine control system is equipped with a comprehensive help system which, upon actuation of the "?" key, furnishes specific information on the respective parameter. The help system differentiates between so-called page-specific help, variable help and malfunction help. Theme-specific information can be retrieved directly and is illustrated with numerous examples.

ENGEL CC 200. Extensive standard equipment.

CC 200 Machine Control.

Microcomputer CC 200 with modular intelligence, with control panel computer and 12,1 inch TFT colour monitor with touch screen interface. Storage of setup data on Compact-Flash, Access authorisation with key card, Ethernet interface for network intergration. With a comprehensive range of standard options and demand-orientated optional equipment CC 200 offers the full potential for all applications.

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ENGEL CC 200: standard features

- Screen languages switchable (minimum 2 languages)
- Parameters in absolut and relativ values / units in ISO or imperial
- Cycle time analysis grafic supported incl. part time monitoring
- Context sensitive user manual on screen
- Note function
- Print out onto local printer, network printer or file
- Diagnose tool for status analysis of hardware and software
- Scope function for I / O analysis
- Patented linearisation function
- Automatic calibration program
- Log book function for inputs and alarms, configurable
- Error messaging system
- Machine diagnostics and maintenance intervals
- Mould specific equipment set-up for screen page optimization
- ENGEL MICROGRAF: for parallel visualization and monitoring for up to 16 process parameters
- ENGEL MICROPLAST: visualization of flow rate
- Process data diagram: continuous minutes of selectable process on printer or in file
- Heating zones self optimizing with startup sequence, emergency mode, quick setup, visualization and monitoring graphic supported
- Fully graphic screen pages with touch operation
- Programme access rights management with access rights on chip card
- Integrated date set memory (up to 100 data sets)
- Sequence editor graphically supported
- Holding pressure switchover functions in parallel
- Manual operation of machine by "membrane" keypad
- Grafical or numerical adjustment of profiles with various step number
- Quickset function for profiles
- Week timer for heating on / off and motor off
- Mould sets on board, network or on flash card
- Program startup phase with mould safety
- Ethernet interface (network connection)
- USB interfaces (4 times)
- ENGEL ERC ER-HLi or ENGEL ER-USP interface (Plug & Play)

Options for flexible application.

ENGEL CC 200: options against surcharge

Indicators

- Screen text in additional languages
- Acoustic alarm combined with signal lamp
- ENGEL AUTOPROTECT precision mould protection with selectable monitoring of speed or pressure including pressure sensor
- ENGEL AUTOPROTECT injection monitoring with selectable monitoring of injection speed, injection pressure or cavity pressure.
- Charge amplifier Kistler 5155 A2211Q02 1- to 4 channel, without switch point optimization (without mould cavity pressure transducer)
- Charge amplifier Kistler 5155 A2213Q02 1- to 4 channel, with switch point optimization (without mould cavity pressure transducer)

Operation

- Integrated data set memory (up to 500 data sets)
- Rotary switches on operator panel instead of standard "membrane" keypad
- Push button for screw retraction without rotating
- Motor "ON" via week timer

Interfaces

- for measuring jack (v,s,ph)
- for external vacuum equipment
- for material or colour feeder via dry contact (contact is closed during plasticizing)
- for conveyor belt (selection via table)
- for external ejection monitoring device
- for freely programmable dry contacts (4x digital output, 4x digital input)
- Ejector back confirmation
- for future installation of charge amplifier 1-channel (selection of type via multiple choice)
- for temperature control units (selection via multiple choice)
- for unscrewing device
- Euromap 12 interface for robot / automation
- Euromap 67 interface for robot / automation
- for gas pressure control units 1- or 2-fold

Software packages

- Process data graphics I: continuous, graphical monitoring of 6 selectable process parameters, average value, standard deviation, coefficient of correlation, warning and intervention limits selectable
- Process data graphics II: graphical visualization of correlation and frequency distribution of up to 6 selectable process parameters
- ENGEL MICROFLOW
- Automatic shutdown / purging program (Ghost shift)
- Energy calculation and analysis program
- Stroke dependent pre-injection program (cold slug purging)
- Batch size counting program
- Graphical display for productivity analysis
- MINI-CAM setup assistance for process parameters based on an expert system
- Connection license for EMS (Engel Monitoring-System)
- Alarm Messaging via E-Mail
- Chat-mode
- Remote Control and Teleservice

Temperature card

- Extension group for 8 heating zones

ENGEL CC 200: accessories

Controls / Electrical

- Colour graphics printer
- External PC-keyboard
- Flash Card 32 MB
- Flash-Card 128 MB
- Chipcards for access controls (10 cards)
- Scanner for Compact Flash Cards with USB-interface
- Disk drive

Software module:

- Virtual Machine – Process optimizing and simulation in offline mode

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