BlowMotion

pc based solution

Wall-thickness and motion-control for blow moulding machines

precise
flexible
efficient

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BlowMotion

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Overview

- IPC-control based on Windows CE.NET
- Function independent hardware from Beckhoff
- Control CPU integrated in the operator panel
- Operator panel with touch screen
- Extremly fast fieldbus over EtherCAT for the connection of the I/O signals
- PLC software, technology software and visualisation software on one pc
- Beckhoff TwinCAT control software with hard realtime
- Saving data on compact–flash, usb-stick or network server
- Remote diagnostic over LAN (Internet) or modem

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Advantages at a glance

- **Realtime operating system of latest generation: Microsoft Windows CE.NET**
- **Function independent hardware, all software modules are installed in one CPU**
- **Powerfull IPC without fan and rotating storage drive**
- **Exchange of programs by storage card**
- **Operation without UPS, low power usage, low heat development**
- **Small measurements of the system require little space within the switchboard or terminal box**
- **User friendly and easy to handle operation on the screens**

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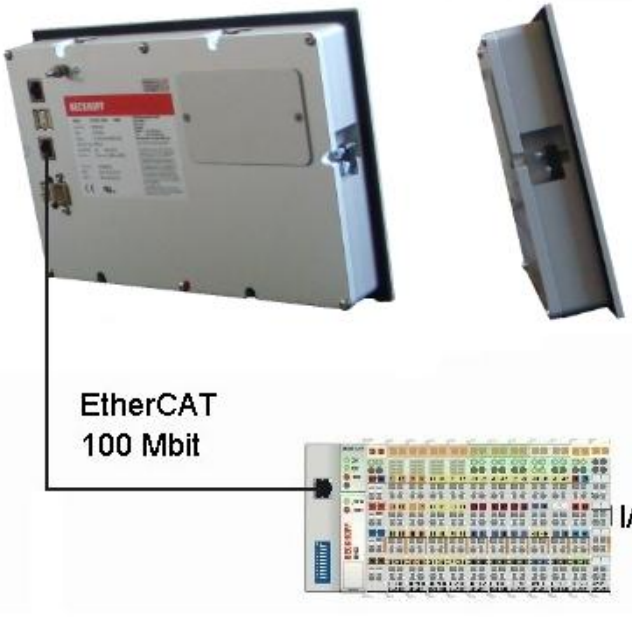
Concept of control

Control-Panel



- In panel integrated IPC without fan and rotating storage drive
- Powerfull AMD Processor
- 100MBit EtherCAT fieldbus for the connection of the I/Os
- Max. 100m distance between two I/O stations
- USB interface (e.g. for USB-stick, additional keyboard, …)

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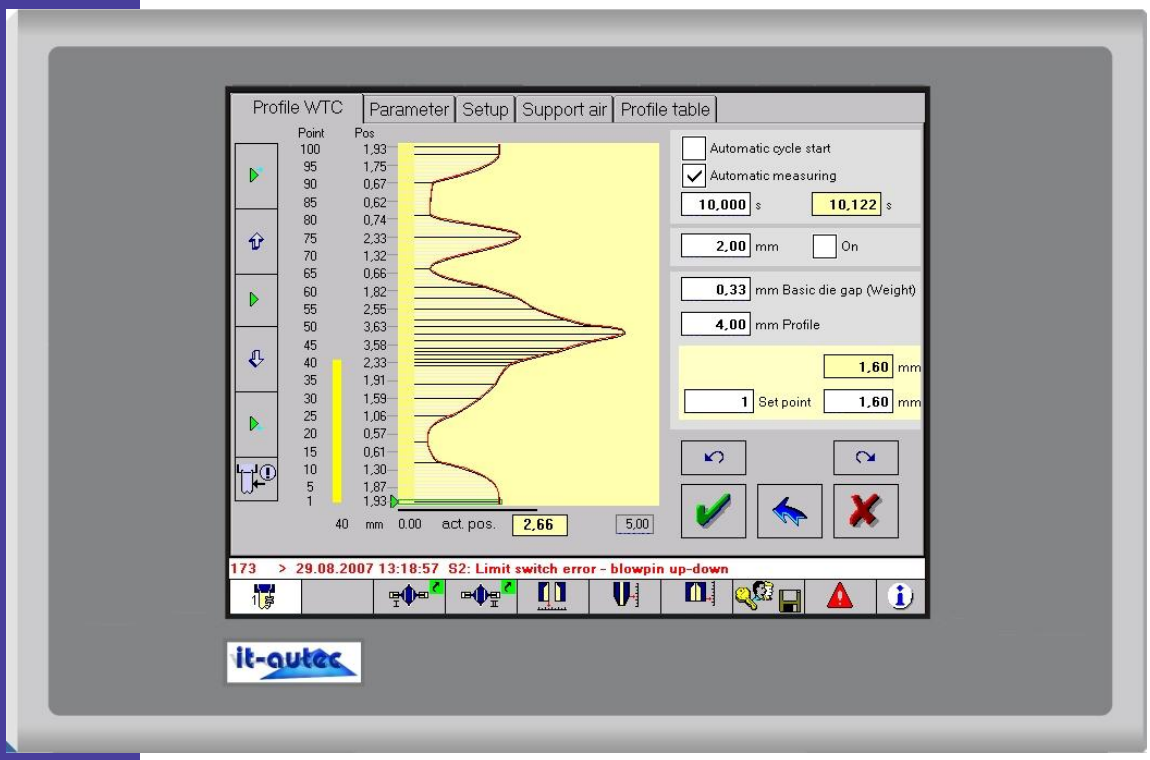
Operator panel



6.5 inch TFT display, resolution 640 x 480 pixel

Touchscreen

Installation in the wall of the switch board or hanging panel version

Ethernet-interface 1GBit, USB-interface

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Function overview

- Wallthickness control up to 3 channels (hydraulic or electric control e.g. stepper or servo drive)
- Accumulator head operation (constant ejection or profiled)
- Parison length control in case of continous extrusion
- Filling level control and die adjustment during accumulator head operation
- Distance cams for clamping unit, blowpin and mould transport
- Motion control for hydraulic axis e.g.: Mould close and open, blowpin up and down, mould transport, core puller
- Path-dependent switching to pressure control, position control, asynchronous mould closing , integrated scope function
- Diagnostics, error message in plaintext and timestamp
- Saving setting parameters on compact-flash, USB-stick or network server
- Language and character set reversal for various languages
- Access control via PIN-code, 3 user levels , optionally finger print system

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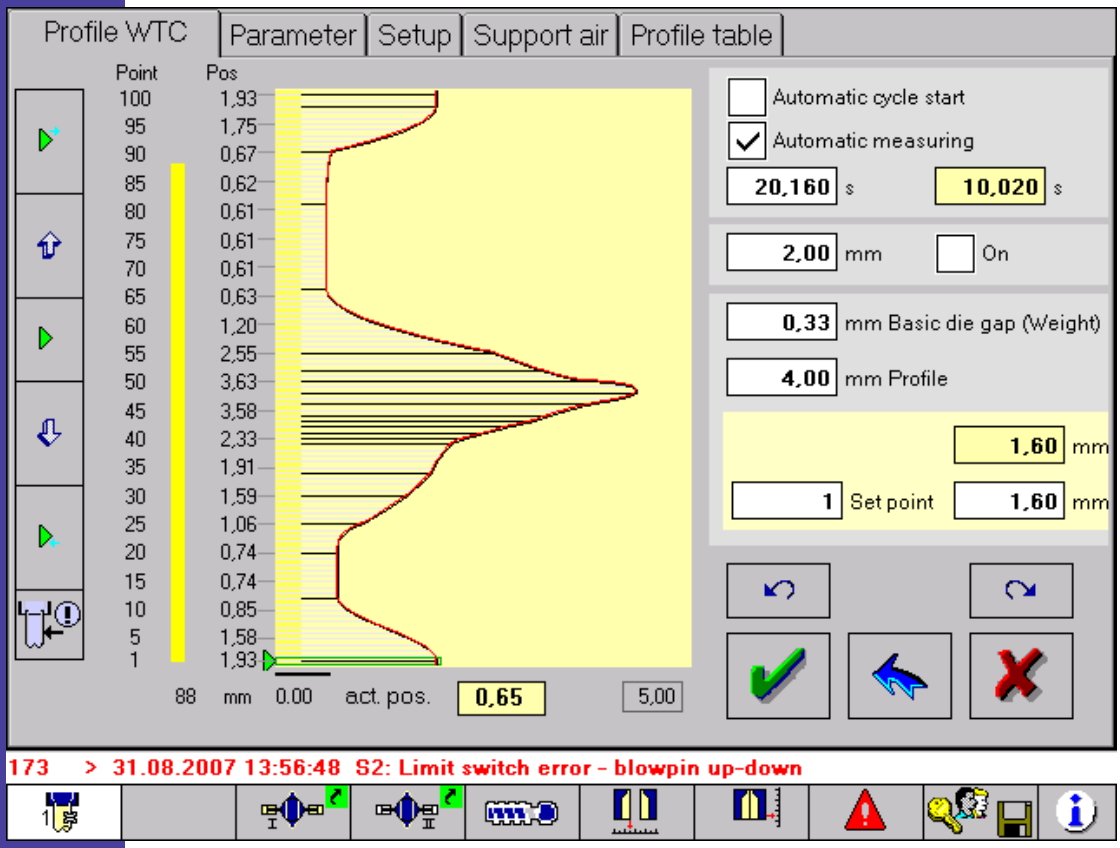
Wallthickness control



- Continuous or discontinuous extrusion
- 100 points wallthickness profile
- Up to 3 channels synchron (wtc– pwtc – multiple extrusion head)
- 1 channel parison ejection
- Correction of parison elongation (linear proportion)
- Cycle time specification manually or automatically
- Path check marks (max. 2 at the same time) simply by setting of thick or thin places
- Test position (for die cleaning)
- Adjustable tolerance supervision of the actual value

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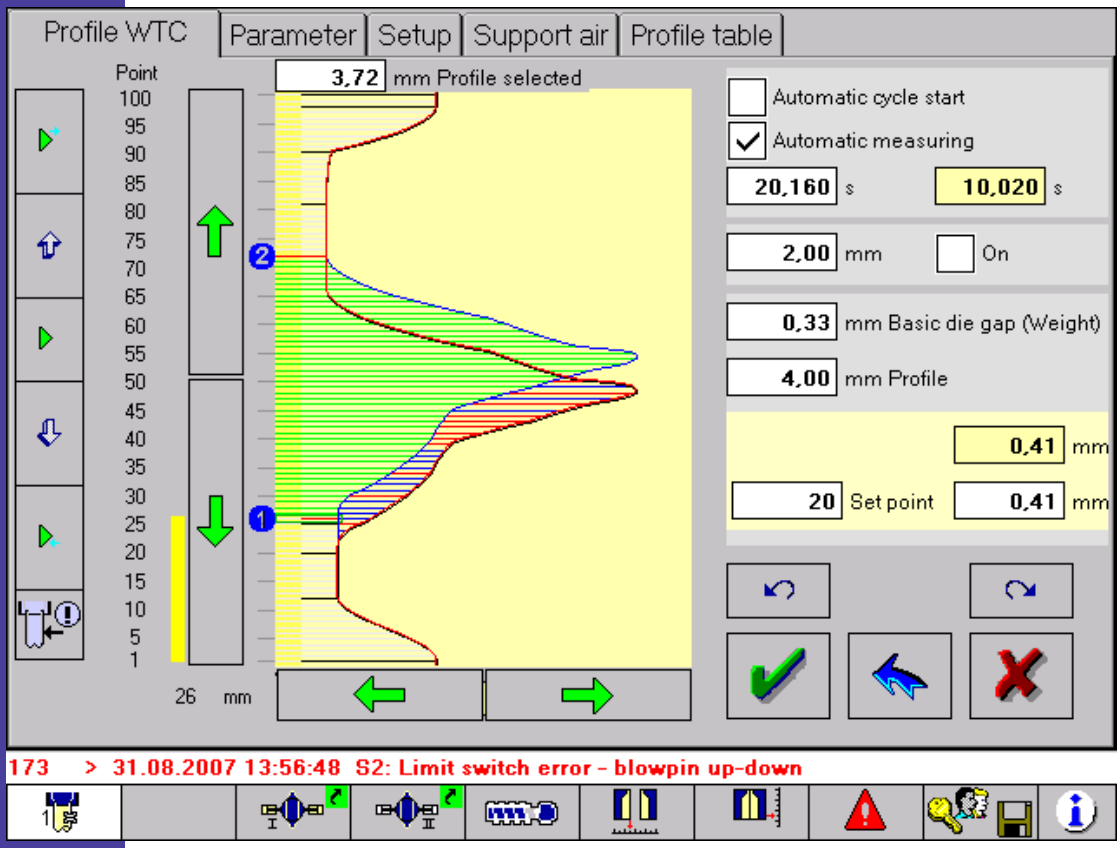
Wallthickness control



Single points or curve segments can be vertically or horizontally scrolled

The whole curve can be rotated

Curve memory up to 10 curves per channel (UNDO-, REDO function)

The profile part of a curve segment can be changed separately

Automatically start cycle for setup and test

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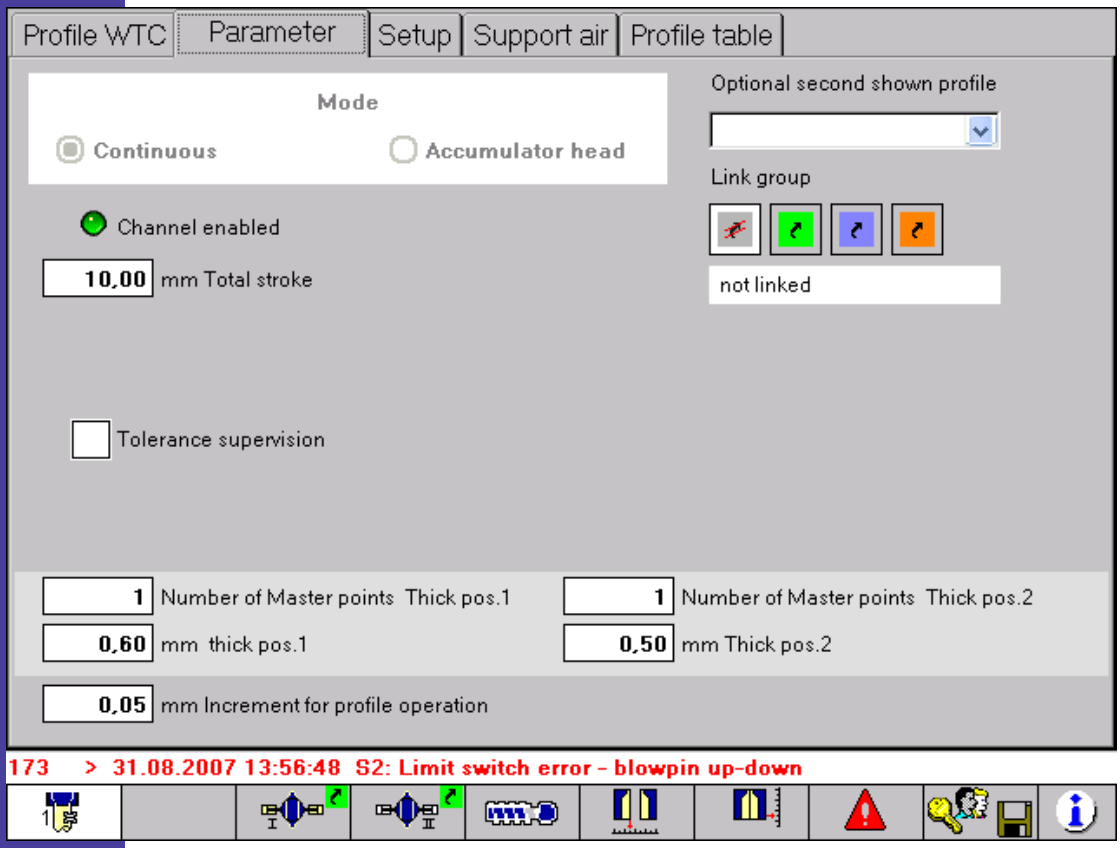
Wallthickness parameter



- Paramters are visible only for preselected functions
- Profiles can be linked together, i.e. one profile can be diverted to several channels
- Width and length of thick places can be preselected
- Increments of graphic curve adjustments can be adjusted in mm
- Tolerance supervision with monitoring of minimum and maximum deviation and appendant profile points

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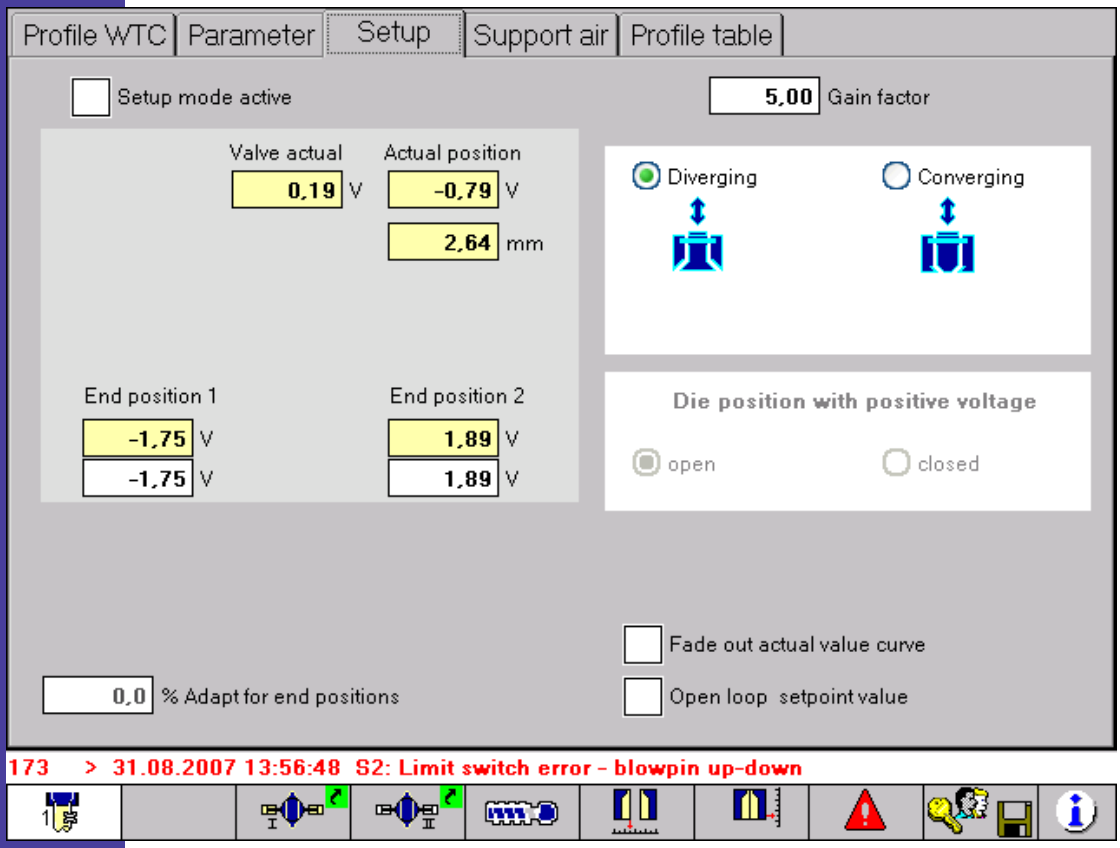
Wallthickness calibration



Automatic or manual calibration of the analog actual value transmitter (LVDT)

Identification of polarisation, i.e. actual- and nominal value have different directions

Distance form the mechanical stoppers can be adjusted

Switching of die geometrie (diverging, converging)

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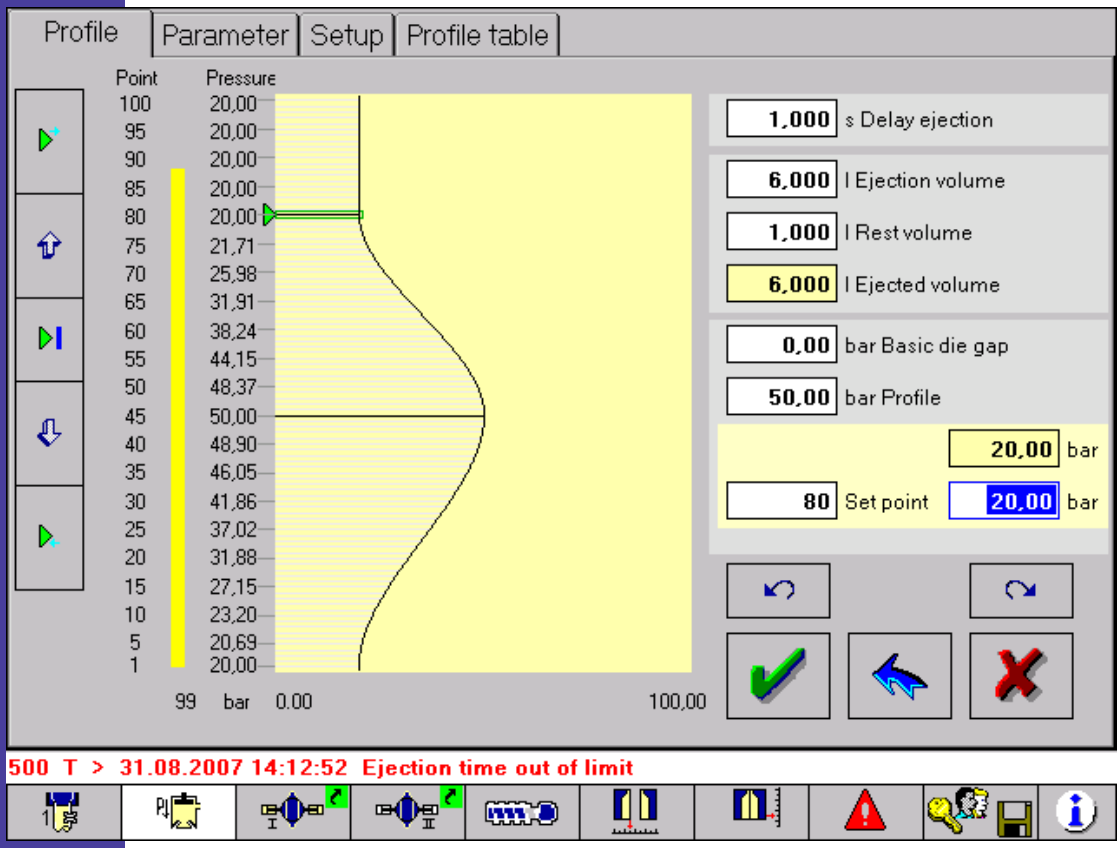
Accumulator head operation



- Alternatively constant ejection or push out using printed profile
- Sliding route synchronisation for ejection
- Rest volume
- Measuring and monitoring of ejection time
- Filling pressure default for filling procedure

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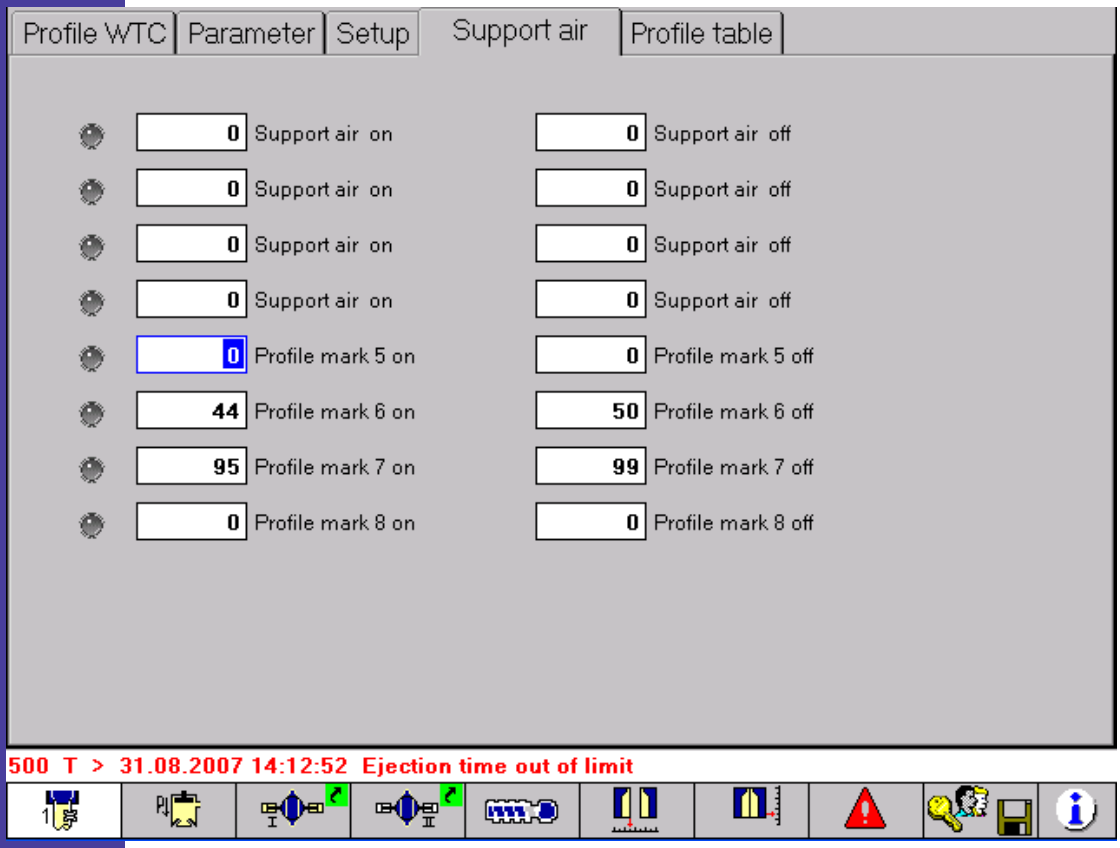
Profile marks parison



Up to 8 profile marks on the parison length

On- and off switchpoints separatly adjustable

Switchpoint also possible when exceeding the cycle (e.g. from point 80 up to point 20)

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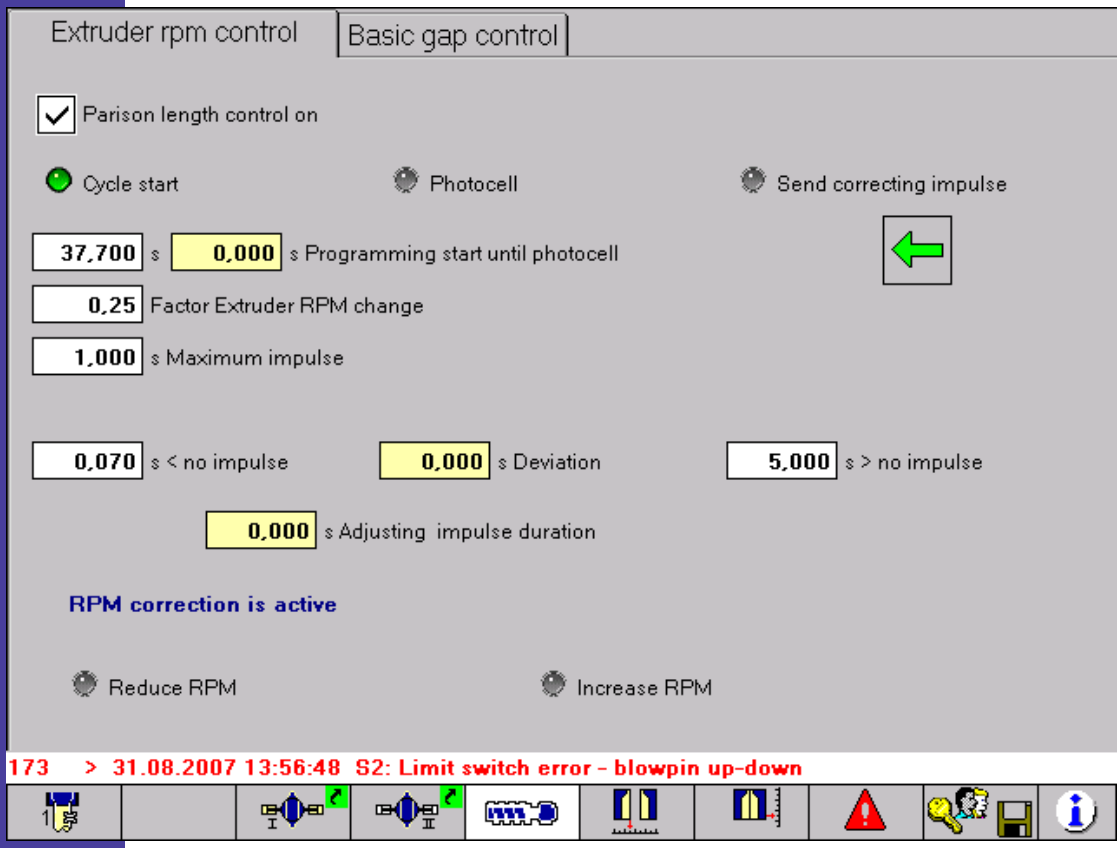
Extruder speed correction



Correction of extruder speed with signal photo cell in case of continuous process

Filling level control of accumulator head at discontinuous process

Control of parison length using a photo cell and die adjustment using accumulator head process

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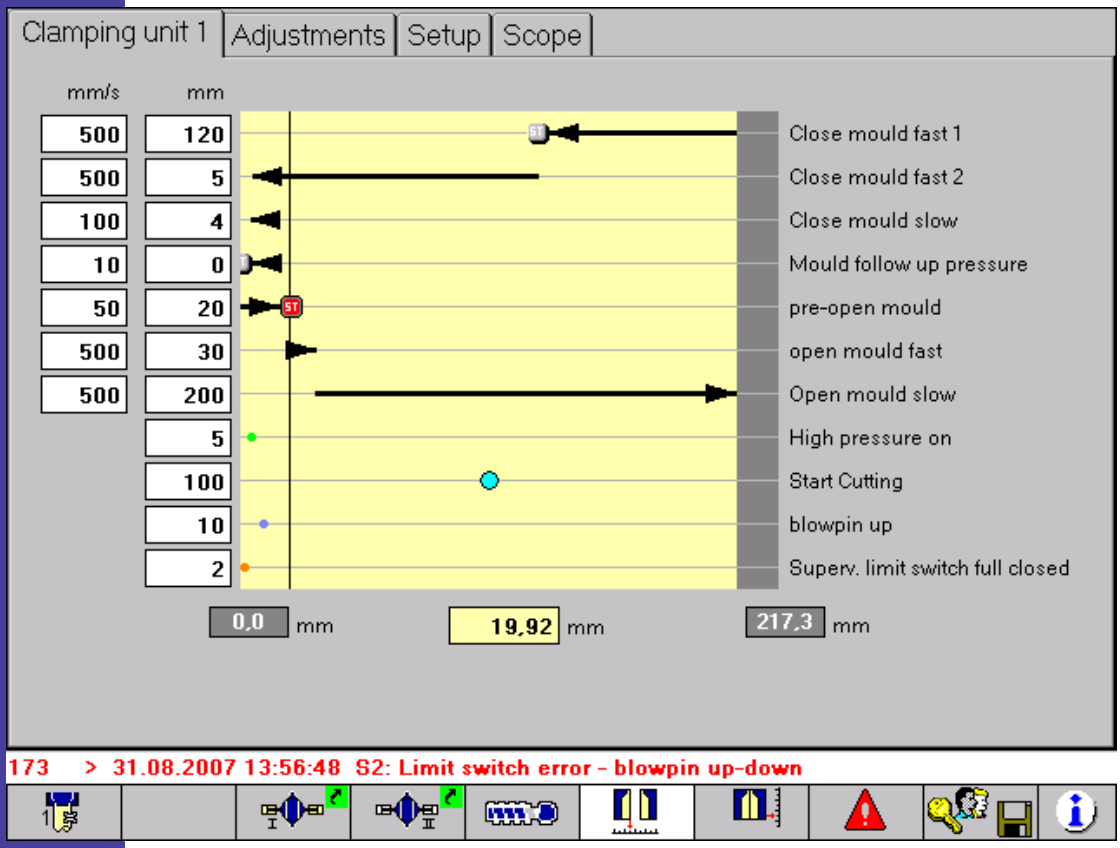
Motion control



Up to 3 channels motion control e.g. for mould open/close, blowpin up/down, mould transport, core puller, article discharge, …

Up to 8 speed reshift, movement arrows can be adjustetd independant by direction

Up to 8 cams for route dependant control of machine functions

A stop can be parameterised for each movement arrow

Controlled setpoint at the final psoitions can be parameterised

Closed loop linear pressure acceleration in the final positions

Path dependant switching to closed loop pressure control

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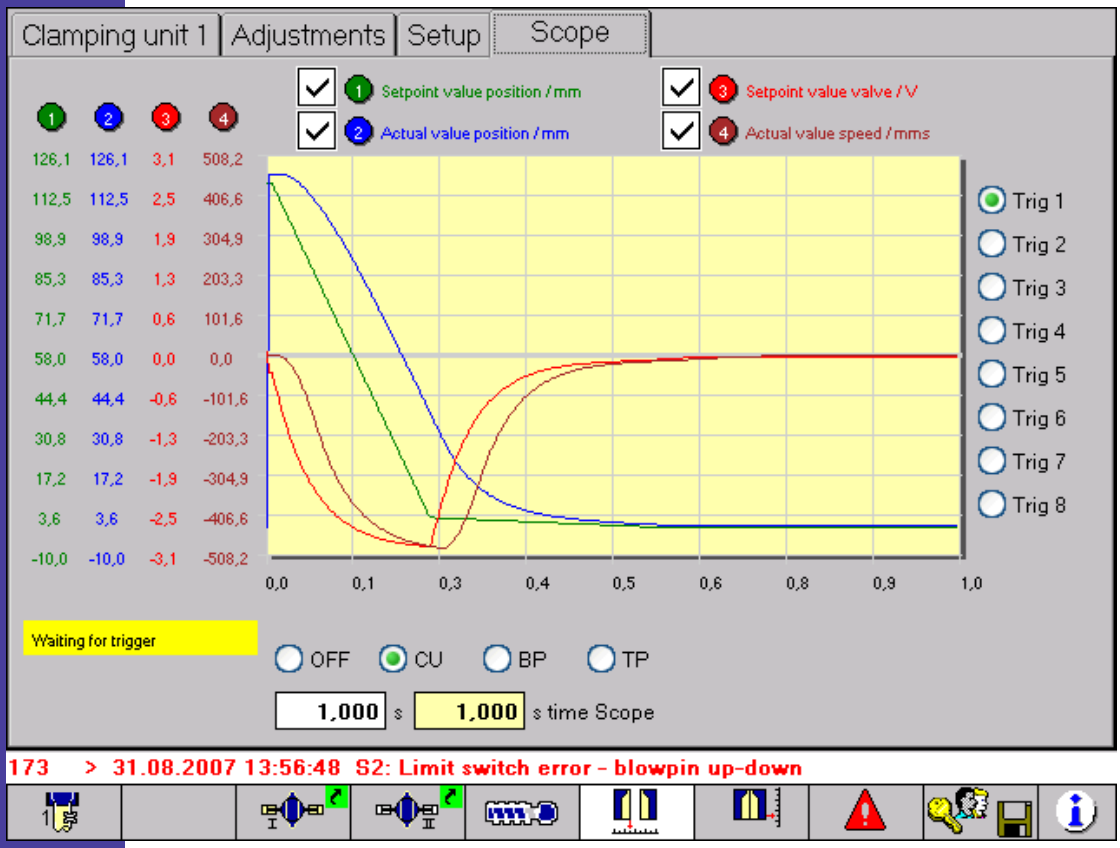
Scope function



Scope funtions for aid to set up the motion control axis

Measurement of path in (actual and nominal value), actual speed in mm/s and valve output in V

Trigger point adjustable for each movement arrow

Time of measurement adjustable

Automatically scaling of measured values

Not used values can be hide out

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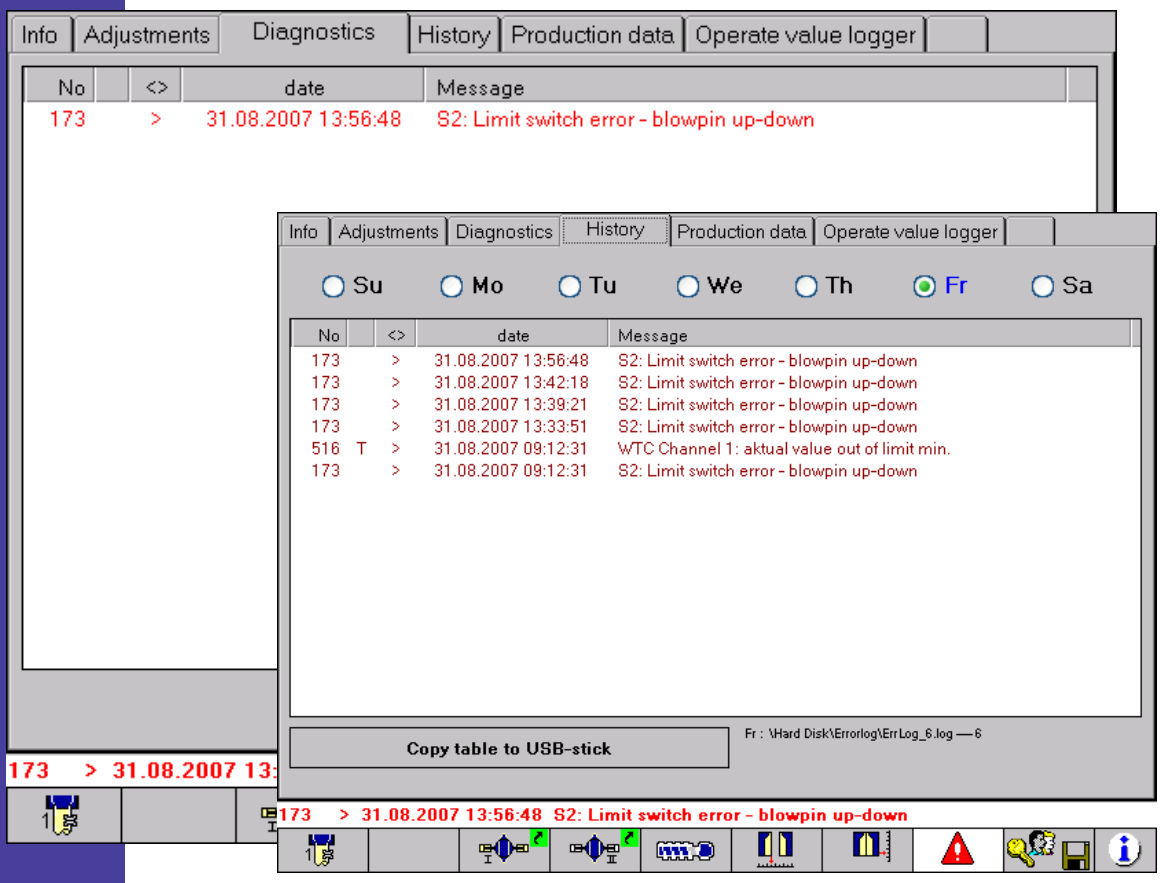
Diagnostics



Error message and status message are shown in clear text

Timestamp for message „appear“ and message „disappear“

History for one week in internal memory

Optionally histroy on network server in daily reports

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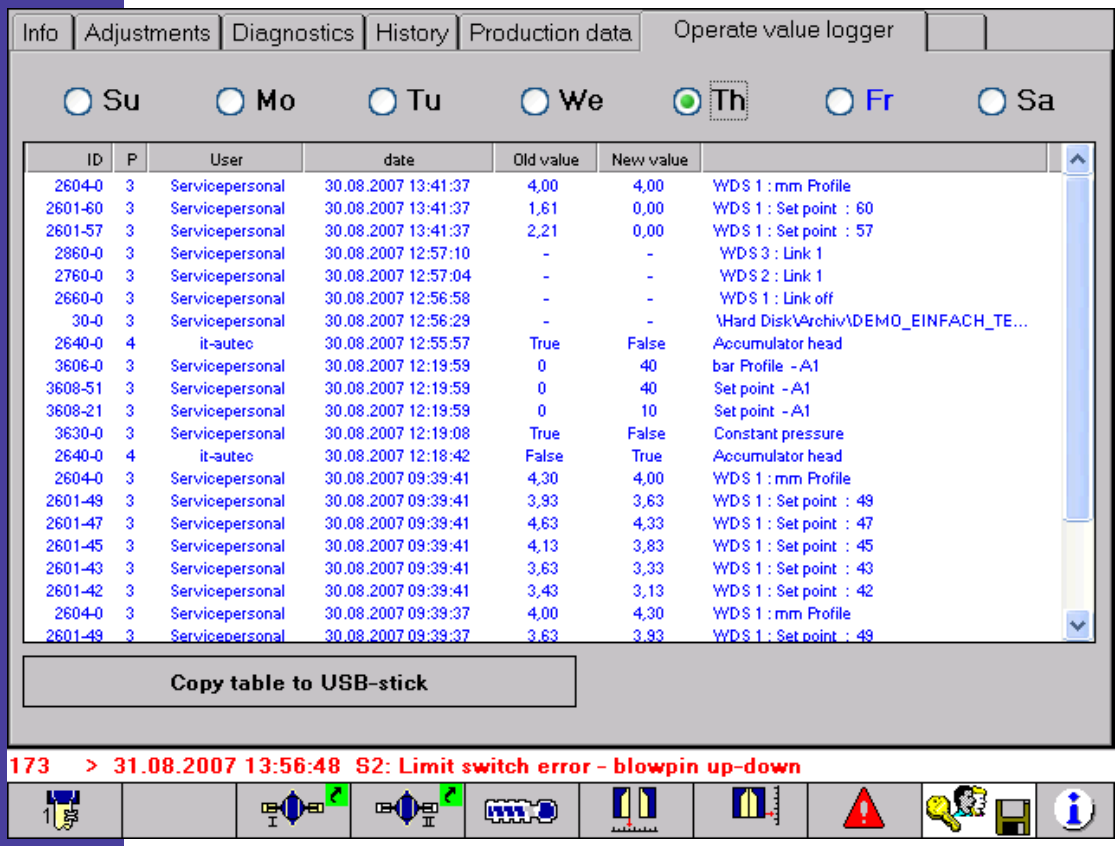
Operator protocol



ID	P	User	date	Old value	New value	
2604-0	3	Servicepersonal	30.08.2007 13:41:37	4,00	4,00	WDS 1 : mm Profile
2601-60	3	Servicepersonal	30.08.2007 13:41:37	1,61	0,00	WDS 1 : Set point : 60
2601-57	3	Servicepersonal	30.08.2007 13:41:37	2,21	0,00	WDS 1 : Set point : 57
2860-0	3	Servicepersonal	30.08.2007 12:57:10	-	-	WDS 3 : Link 1
2760-0	3	Servicepersonal	30.08.2007 12:57:04	-	-	WDS 2 : Link 1
2660-0	3	Servicepersonal	30.08.2007 12:56:58	-	-	WDS 1 : Link off
30-0	3	Servicepersonal	30.08.2007 12:56:29	-	-	\Hard Disk\Archiv\DEMO_EINFACH_TE...
2640-0	4	it-autec	30.08.2007 12:55:57	True	False	Accumulator head
3606-0	3	Servicepersonal	30.08.2007 12:19:59	0	40	bar Profile - A1
3608-51	3	Servicepersonal	30.08.2007 12:19:59	0	40	Set point - A1
3608-21	3	Servicepersonal	30.08.2007 12:19:59	0	10	Set point - A1
3630-0	3	Servicepersonal	30.08.2007 12:19:08	True	False	Constant pressure
2640-0	4	it-autec	30.08.2007 12:18:42	False	True	Accumulator head
2604-0	3	Servicepersonal	30.08.2007 09:39:41	4,30	4,00	WDS 1 : mm Profile
2601-49	3	Servicepersonal	30.08.2007 09:39:41	3,93	3,63	WDS 1 : Set point : 49
2601-47	3	Servicepersonal	30.08.2007 09:39:41	4,63	4,33	WDS 1 : Set point : 47
2601-45	3	Servicepersonal	30.08.2007 09:39:41	4,13	3,83	WDS 1 : Set point : 45
2601-43	3	Servicepersonal	30.08.2007 09:39:41	3,63	3,33	WDS 1 : Set point : 43
2601-42	3	Servicepersonal	30.08.2007 09:39:41	3,43	3,13	WDS 1 : Set point : 42
2604-0	3	Servicepersonal	30.08.2007 09:39:37	4,00	4,30	WDS 1 : mm Profile
2601-49	3	Servicepersonal	30.08.2007 09:39:37	3,63	3,93	WDS 1 : Set point : 49

Each change of value by the user is logged in the operator protocol (with following information: timestamp, user, level, old value, new value)

This protocol is stored on the internal flash card for one week

If process data looging to network is activated, this protocal will also be stored on the server as daily report

Herewith down time by faulty operation can be proved

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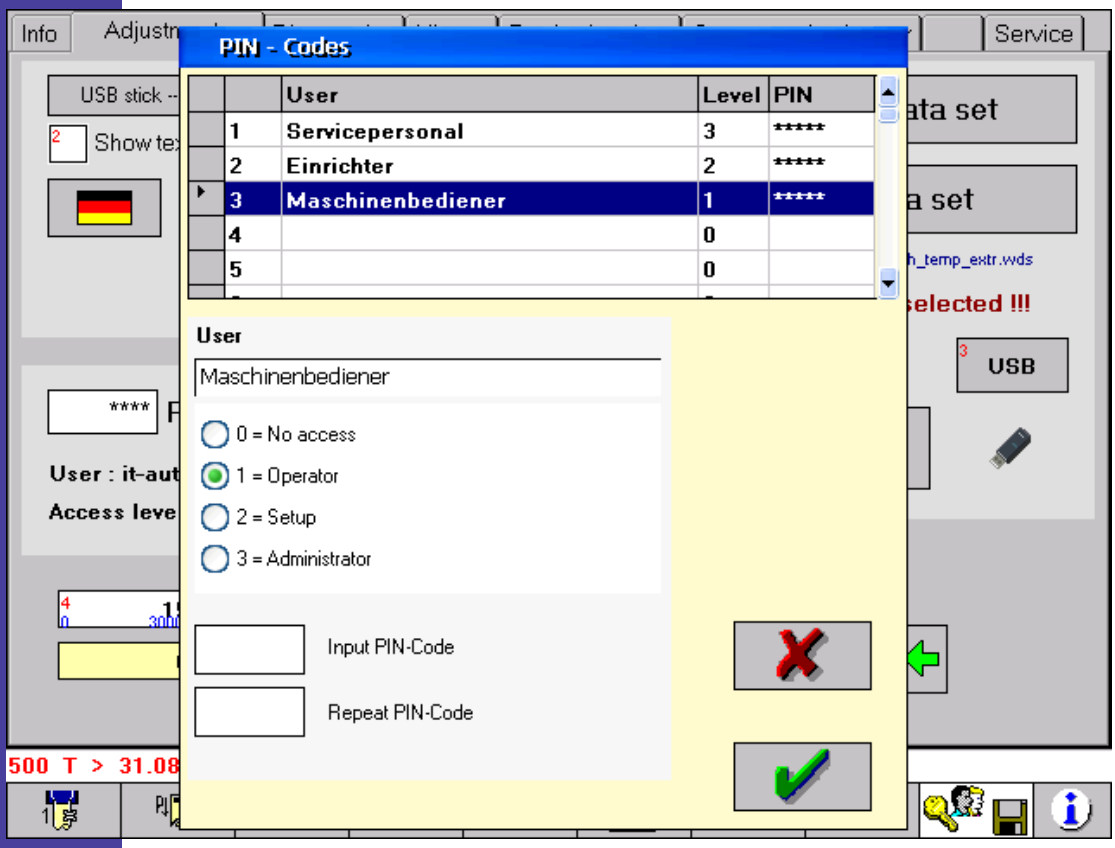
User management



User access by PIN-Code

3 different levels (machien operatorm setter, service people) + system administrator

Optionally user access by finger print system

The user levl for each set value, preselector and button on the screen is adjustable by the system administrator

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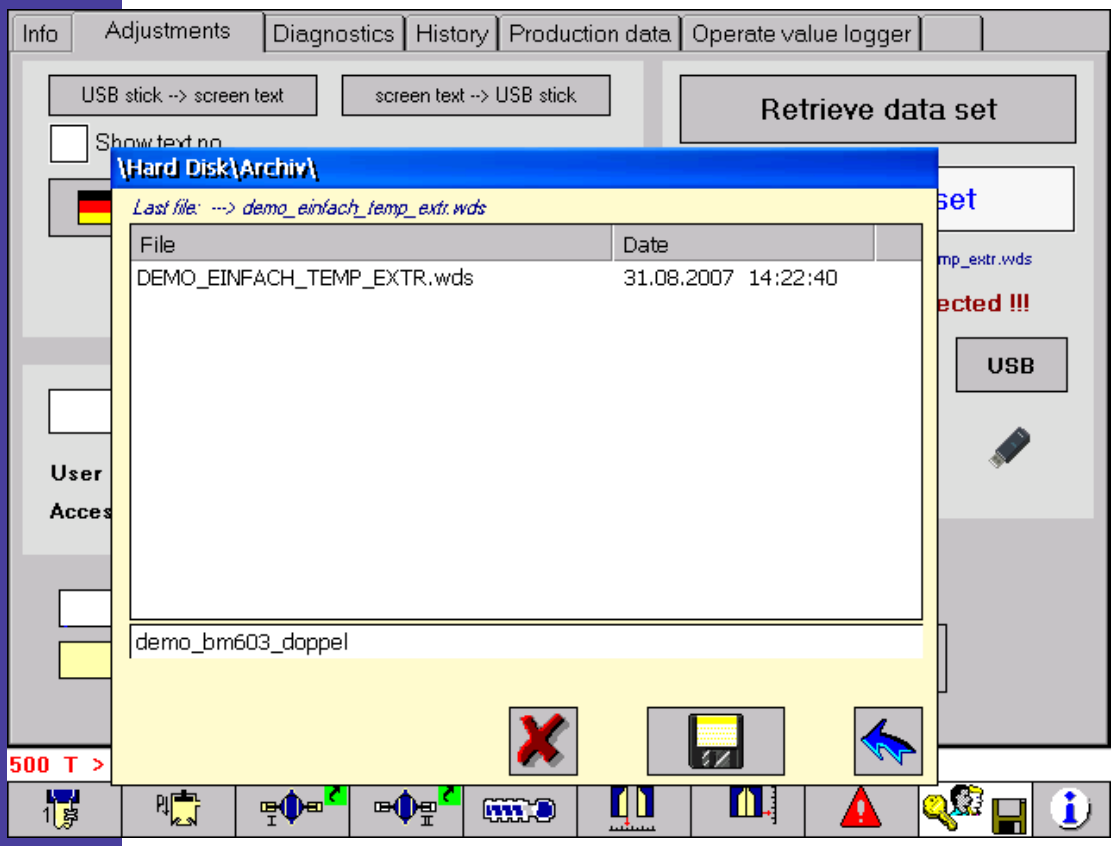
Management of recipes



All set parameters can be stored and reloaded in an internal memory or on an USB.stick

Optionally the recipes can be stored and reloaded on a network server

The whole set of parameters can be stored or set of paramaters like Wallthickness, Motion, …

To use the parameters in a another machine it is possible to reload the paramenters without the machine specific paramter from a data set

To each data set can be added a discription in clear text

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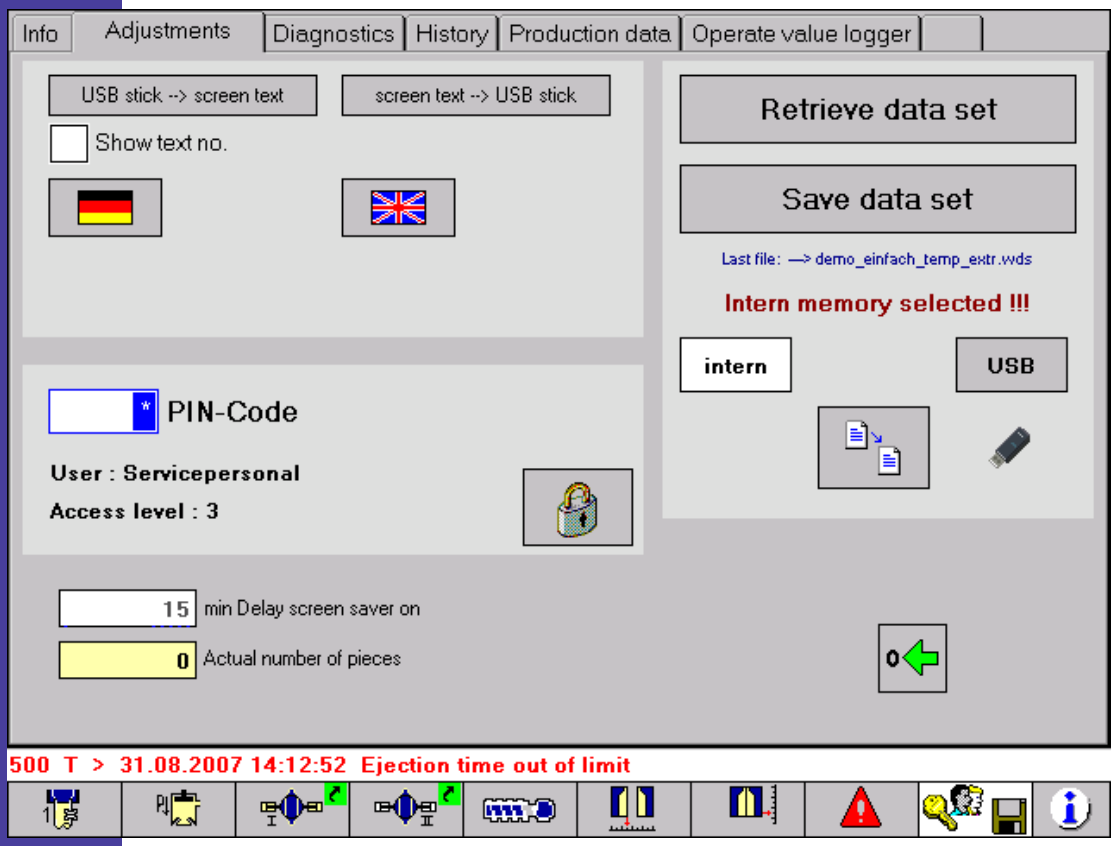
Miscellaneous



- Reversal of language for user interface
- The text files for screen- and error text can be updated by USB-stick
- Screen saver
- Hydraulic pump on time
- Automatic mode on time

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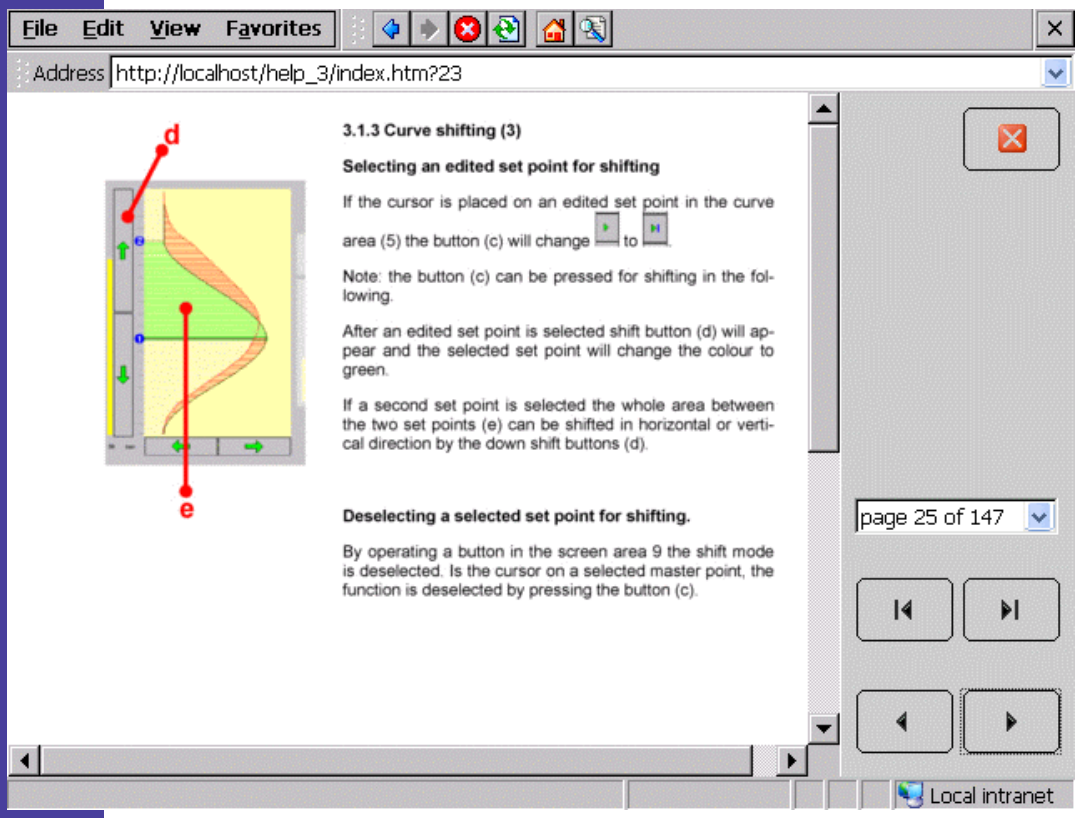
HTML Online Help System



Help button: At each page the help button display the html online help system in the local browser.

The complete manual is disposited in html files

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