FELLER ENGINEERING GmbH

VISUAL FECON

Operator Manual

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Version 1.4

Status: 10/16-0301

INHALT

Quick Start

Installation

Following the next six steps Fecon will indicate the process values on the linked units within a short time!

1. Installation of the software

Visual Fecon may be delivered on a CD-ROM or on discs. In both cases the setup will be started by FECON.EXE. FECON.EXE is to find in the root directory of the CD-ROM or on the first disc.
Please follow the orders of the setup program. The default installation will be started in the file C:\PROGRAMS\FECON.

Important: The computer has to be restarted after a successful installation!

2. Installation of the serial interface

FECON offers two ways to link the PC and the devices. The standard delivery of FECON includes an interface module, type SI13c or SI13d. The input to this module has to be connected to an available interface COM1: - COM4: of the PC (9 pin D-Sub plug). The output RS485 is wired to the 9 pin D-Sub socket. Pin 2 and 3 of this socket have to be linked to the external controllers (parallel). After contact to the power supply the POWER-LED 1 and 2 will light at first. The SI13 will be delivered with a separate manual.
Connect the cable with the D-Sub plug to the available interface of the PC and wire the desired units via RS485.

3. Installation of the software protection (Dongle)

The copy-protection has to be installed according to the label at the printer port (LPT1:) of the PC. If the dongle is not correctly installed, FECON can only be used in the OFFLINE mode (→ OFFLINE MODE).

First start of the program

During the installation „VISUAL FECON“ was added to the windows start-menu. Start the software by a click at the menu item „FECON“.

4. Login user

After successful start FECON will ask for the username and the password. Start with the username “FELLER” and the password “FECON”. After the correct enter the name and the Level <5> will appear in the foot line of the screen.

Important: The user "FELLER" with password "FECON" is a predefined user with the highest level. To avoid malfunctions these setting should be changed to your personal settings very soon. (see user management)

5. Configuration

As Soon as the units are linked to the controller, the program has to be informed about the type of interface. Please select RS485 among the menu item FILE / CONFIGURATION. Activate the control box **ONLINE** and select the referring COM-Port from the listing (**COM1: - COM4:**) . The default **transmission rate** is 9600 Baud. May be that it has to be adjusted at the units. With RS485 the way of direction control is relevant. Using a SI13c so will this be done “external” and has to be selected. The SI13d makes the change by “DTR”, if a PCMCIA board from maker CSM is used, the lower setting is correct.

Important: Running under Windows NT, only the external change (with SI13c) is possible.

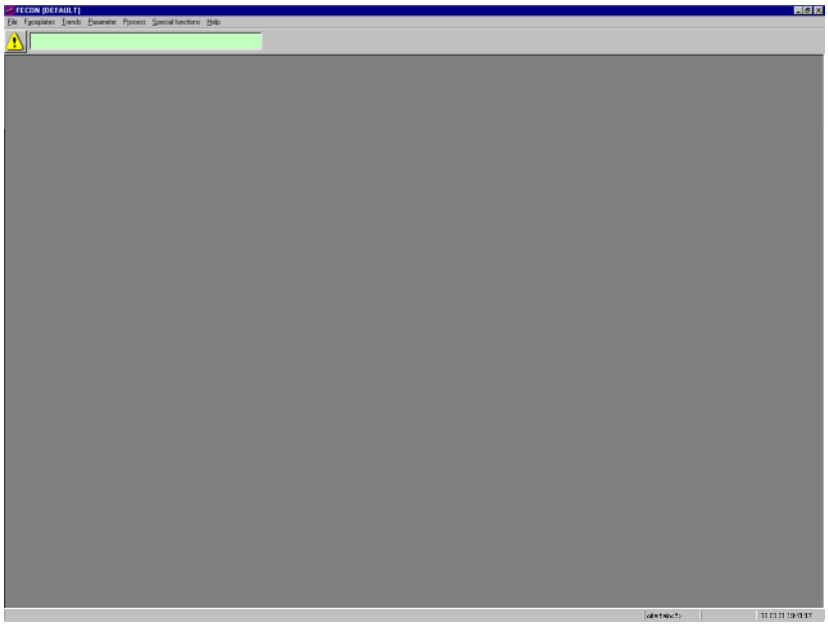
6. Registration of the units

The menu item FILE / PROJECT SETTINGS / BUS and then ONLINE/OFFLINE offers a control box for each of the 30 selectable units. The addresses of the units are listed with an '@'. The devices may be switched on or off (online or offline) by a click to the referring box. Activated unit appear with the so called AZ-number (found sign of the firmware). If addresses should not be available the selection section stays empty. The units will be searched automatically with the button SEARCH UNITS.

Just after a successful identification FECON will read and store all process data continuously. The units may be operated and parameters may be set via FECON. All further configurations are only to adjust FECON to the individual requirements and settings of the plant!

VISUAL FECON Screens

The default structure of the FECON screen is shown on the side.



Alarm indication

The upper section indicates a permanent alarm chart in shortened version. This window indicates the last two alarms of the chart, that are sent from the units. In case of no actual alarms, the window appears with RED otherwise with GREEN background.

As soon as the yellow triangle gets clicked, an extended status report appears. It includes even a historical chart of „older“ alarms.
(→ see message chart)

Status line

In the lower section of the FECON screen there is a status line. It indicates the username with the referring level and the actual time. Even the status of different background tusks is indicated here.

Permanent system check at first sight

There is a small **f** on the right hand side of the windows start line just at that place, where the organisation system indicates the time.

In the case of actual alarms the **f** appears in red otherwise in green colour. This function does also work if FECON runs in the background covered by other programs. The last alarm will be indicted when you touch this **f** with the mouse. This way you have a permanent survey whether all units run well.

User management

General

FECON is protected by different user levels and passwords against non authorised inputs. Any user will be identified by his name and his individual password. Disabled Functions are presented in grey colour if the user level is not sufficient.

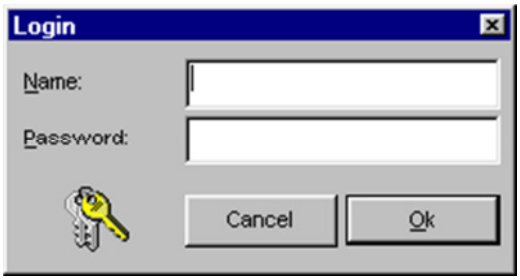
User level

During the definition of a user the referring level will be fixed. Te higher the level the greater is the authority of the user to use the system.

The default username is „FELLER“ with the password FECON. This way you reach the highest level (5) and the possibility to define further users.

User Login

The user logs in the dialog, that is described on the side. The dialog appears automatically after start of the program or after the activation of the menu FILE / LOGIN USER.
The enter of the password occurs covered. Each user login will be added to the → alarm chart of FECON.
After successful login the username and the level appear in the status line of FECON.



User logout

Logout disables the actual user and the system will be locked. The function is to find among FILE / USER/ LOGOUT. For a quick lock of the system press CTRL+X.

Define new users

Generally everybody may define new users to enable the system e.g. for colleagues. The definition of the level is limited to the level of the actual user This way an increase of the level for non authorised persons is inhibited. The dialog on the side shows how the definition of the level for the user “Otterbein” is limited.

Delete users

The entry to FECON for defined users may be disabled by the menu item „FILE / USER / DELETE USER“. This function cannot delete users with higher levels than the actual user.

User Info

Level 5 and higher enables to list all users (including the passwords).

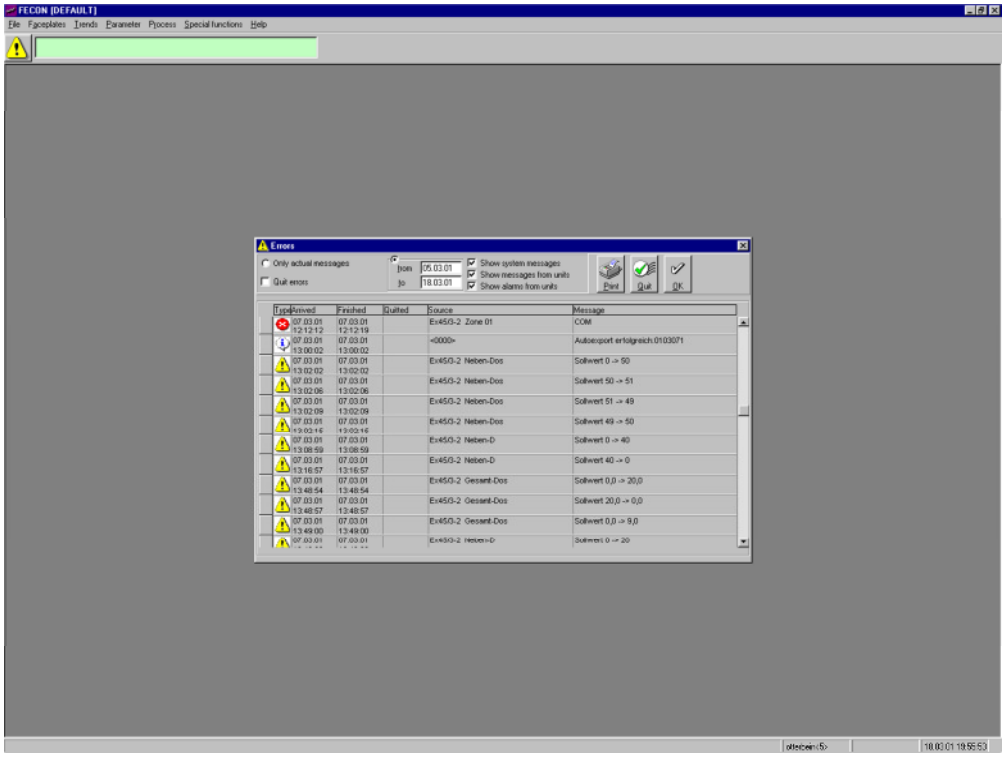
Message chart

FECON demands each unit continuously for actual faults and alarms. In case of new alarms FECON will add these with the referring time to the alarm chart. Even changes of setpoints, user loggings as well as some further reports will be listed.

The chart will be indicated by a click to the yellow triangle in the upper status line.

Types of messages

FECON makes general differences between three types of reports:



1.) **Alarms**
Alarms have the highest priority. They are signed by a red circle with a white X. Alarms are:
- all zone alarms (deviations, Lo- Hi- alarms, broken sensor alarms a.s.o.)
- communication errors with the unit (only for the first zone of a unit)

2.) **Reports**
Reports have just the status of hints. They are signed by a yellow triangle. Changes of setpoints are typical reports.

3.) **Information (system-reports)**
Information are generated by the system itself. They are signed by a blue i on a white ground. Examples for information are user loggings, system start and the delete of files.

Reducing the alarm chart

The indication of the alarm chart may be reduced in a comfortable way. The mode “Only actual alarms“ reduces the chart to the actual alarms. As soon as an alarm is deleted, it will automatic disappear from the chart.

The time range for the indicated alarms may be reduced by FROM..TO.

The type of indicated alarms may be filtered by he selection „System messages“ (information), „Messages from units“ and „Alarms from units“.

Confirmation of alarms

The button "Quit" confirms the alarms. User level 5 allows to confirm the alarms completely. Lower level confirm only the actually indicated alarms. In this case you have to click the button several times to confirm all alarms.
Confirmed alarms are no longer indicated usually. This allows a quick survey for the time after confirmation. If old confirmed alarms should appear even though, so select "quit errors”.

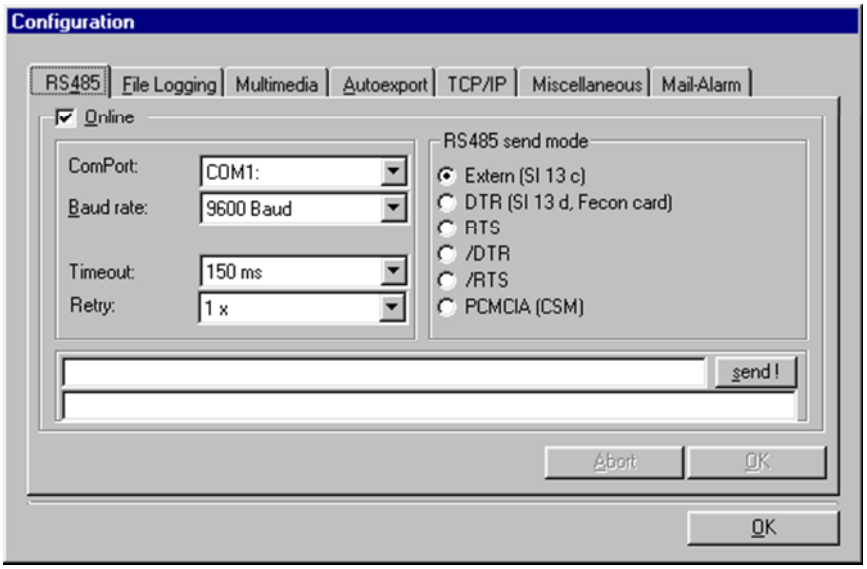
Printing alarms

The print button starts the print of the chart including all filters, that are set.

Configuration

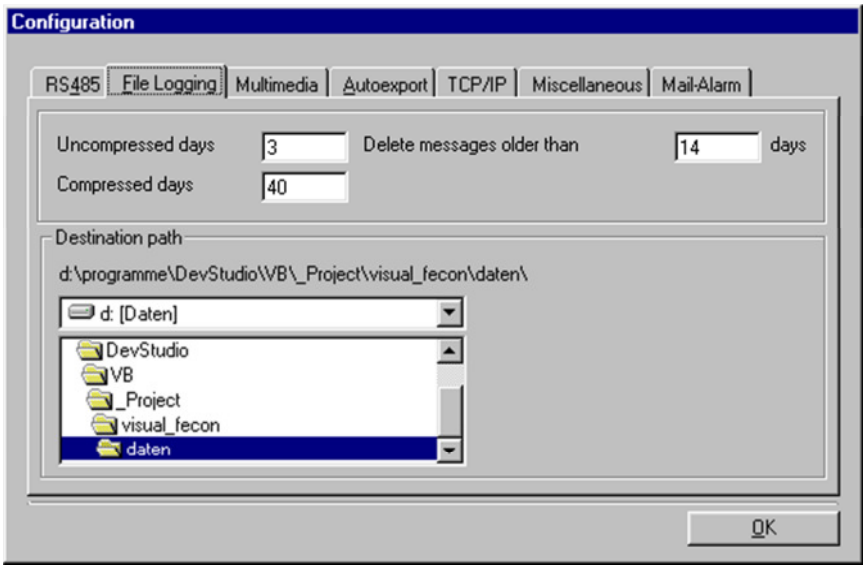
The menu FILE / CONFIGURATION allows different basical settings of FECON:

RS485



RS485 opens settings for the interface. The **ONLINE**-box activates the interface. **ComPort** selects the type of interface for the linked units. **Timeout** limits the time FECON waits for an answer from the unit after demand. The **Baud rate** has to be equal to the linked units. The default value s 9600 baud. The **RS485 Send mode** has to match with the used interface-module. All changes have to be confirmed by both **OK**–buttons.

File logging

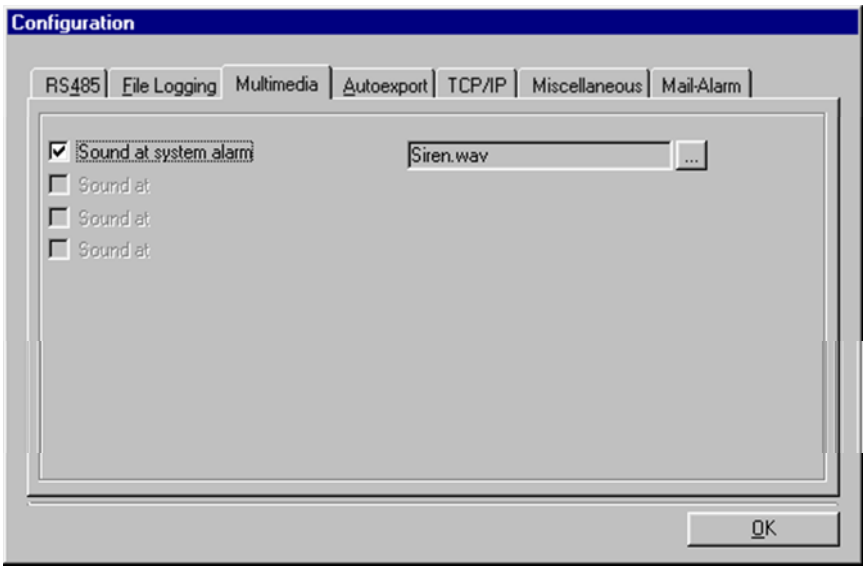


All setpoints, actual values, output rates and alarms of the units are stored on the hard disc in the background in a cycle of 2 seconds. This opens a file of about 8MB for each day. This menu allows settings for the number of the stored files. All files are first saved uncompressed. If the number of files exceeds the "**uncompressed days**" an internal routine compresses the oldest non compressed file. The original file will be deleted afterwards. This way a file of 8MB will be reduced to some hundreds of KB. Even the number of "**compressed days**" may be limited. If this number exceeds the setting, the oldest compressed file will be deleted.
The selection „Delete messages older than... reduces the number of days for the messages in the chart.

Under **destination path** you may select the drive / path where the log-files shall be stored. If the computer is linked to a data-server, the data can even be saved that way. These data can be used OFFLINE from an other FECON version in the net.

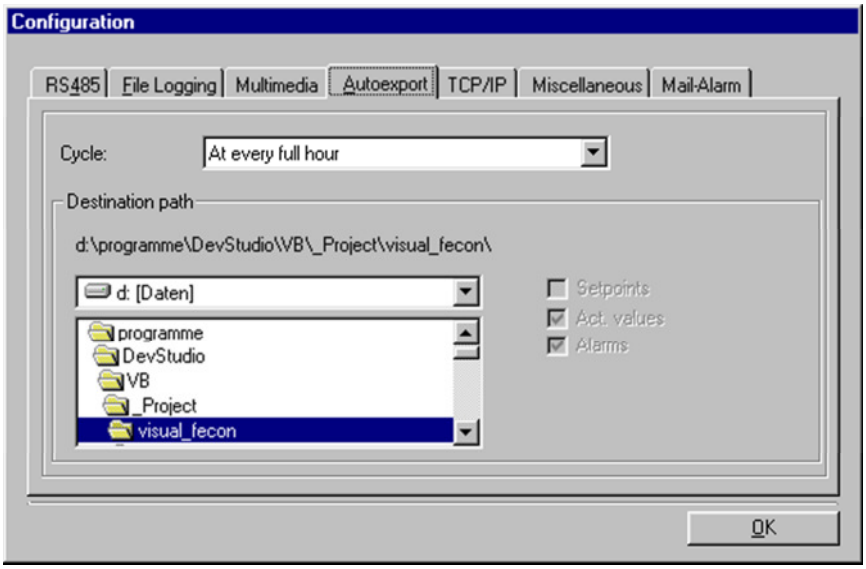
Multimedia

Sounds can be configured here that are played via a soundblaster card in case of alarms.

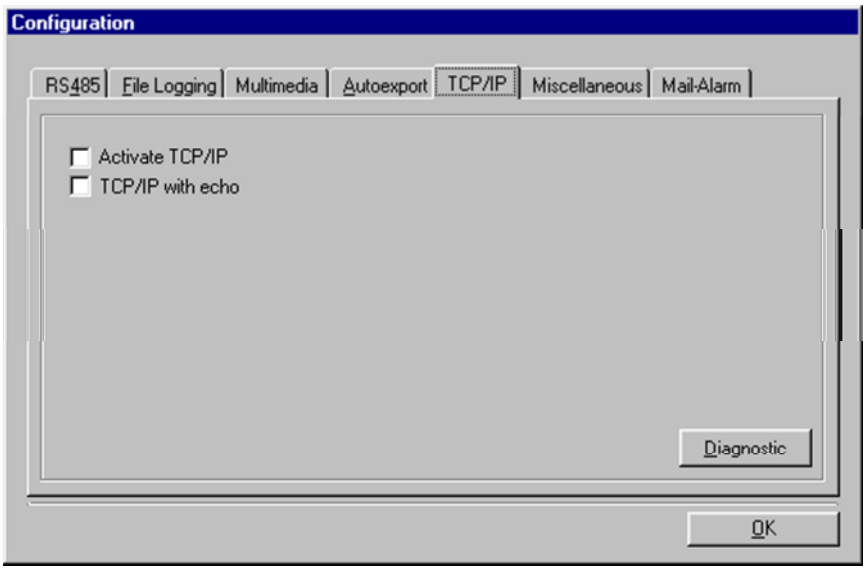


Autoexport

FECON may create an autoexport file on the hard disc additional to the continuous data storage. The activation creates a new ASCII-fie once an hour. It contains the actual values and the alarms from the last hour. These files may be indicated by any editor. They are created for production protocols independent of FECON. (ISO9000)

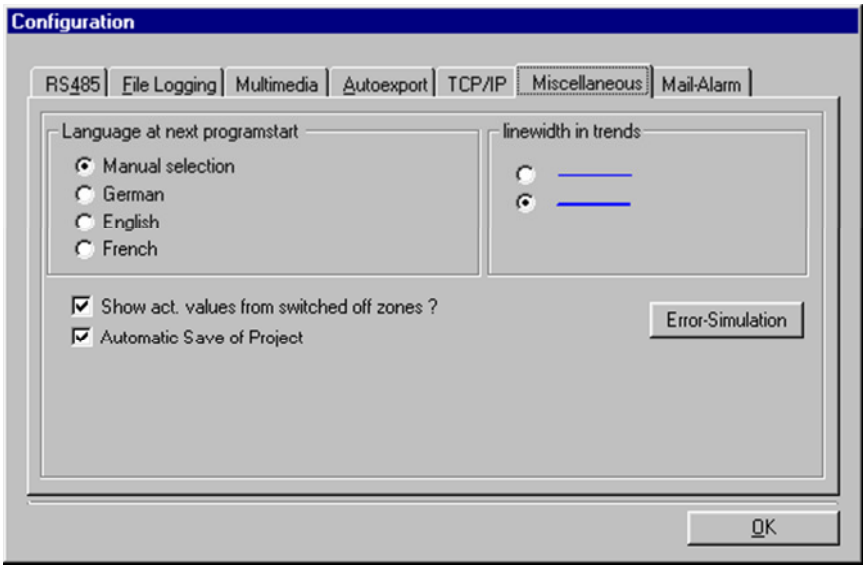


TCP/IP



FECON may be operated from external systems via a TCP/IP interface. Ths way the software gets the function of a data server. It is possible to demad or set values by simple orders. This job is done in the background, so that the user of FECON does not take note. The TCP/IP sevice will be activated in this menu. A link to max. 5 computers is possible. For a detailed description see chapter → **TCP/IP Link**. A simple demo-program is available if required – programmed in Visual Basic.

Miscellaneous



Language selection

The default settings of FECON demand after start for language for the operation. This setting may be disabled in the menu FILE / CONFIGURAON / MISCELLANEOUS. This way FECON is fixed to a certain language after start.

Indication of actual values of disabled zones

The default setting of FECON indicates '---' for the actual values of zones, that are switched off by setpoint = 0. This function may be disabled here.

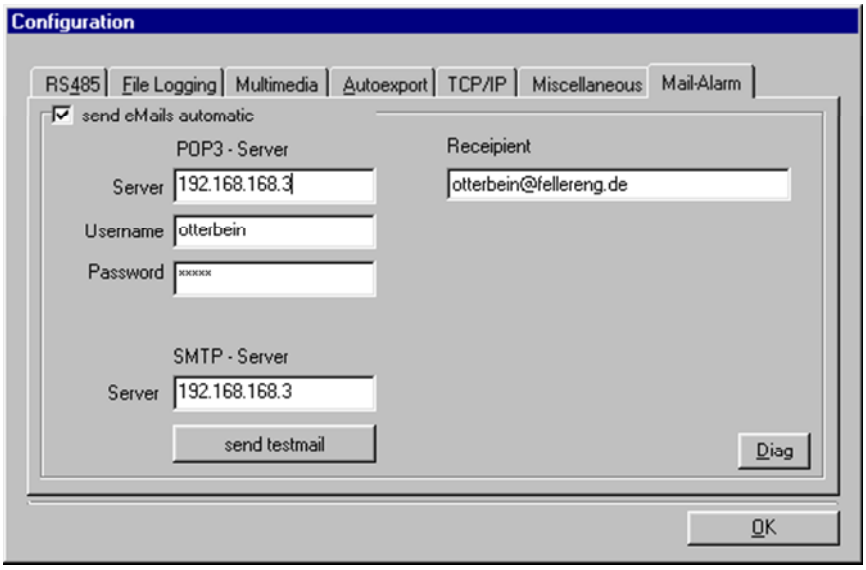
Automatic save of projects with the finish

This item is to find below miscellaneous. In case of deactivation FECON demands before finish for saving of actual changes of the project. The default setting saves automatic.

Linewidth in trends

The required width of the trend lines may be selected here.

Mail-Alarm



FECON is able to send automatic emails from version 1.4 if required! The demand for the computer is the installed entry to a SMTP-server with an active mail-account.
This menu item enables the required settings for the entry.

The actual version allows to create emails each entire hour with the contents of the → Autoexport-File. Actual program alarms will be sent as well. Further functions for emails are planed and will be available with the next versions.

Projects

All changes of unit configurations are saved automatically within the so called “projects”. The default name of a project is “DEFAULT”. All settings may be changed quickly by a change of the project.

Why projects ?

If FECON runs on a mobile PC or FECON is used for different plants, so the management of different “PROJECTS” makes sense. For installations at one single machine the items “NEW PROJECT“ and „OPEN PROJECT“ may be passed.

New project

To use the functions of projects you have to create new projects via the menu item FILE / NEW PROJECT. FECON generates automatic an empty project. Find a name referring to the machine or production line.

Open project

The activation of FILE / NEW PROJECT presents a chart of defined projects. After selection of the desired project FECON starts the new settings automatic.

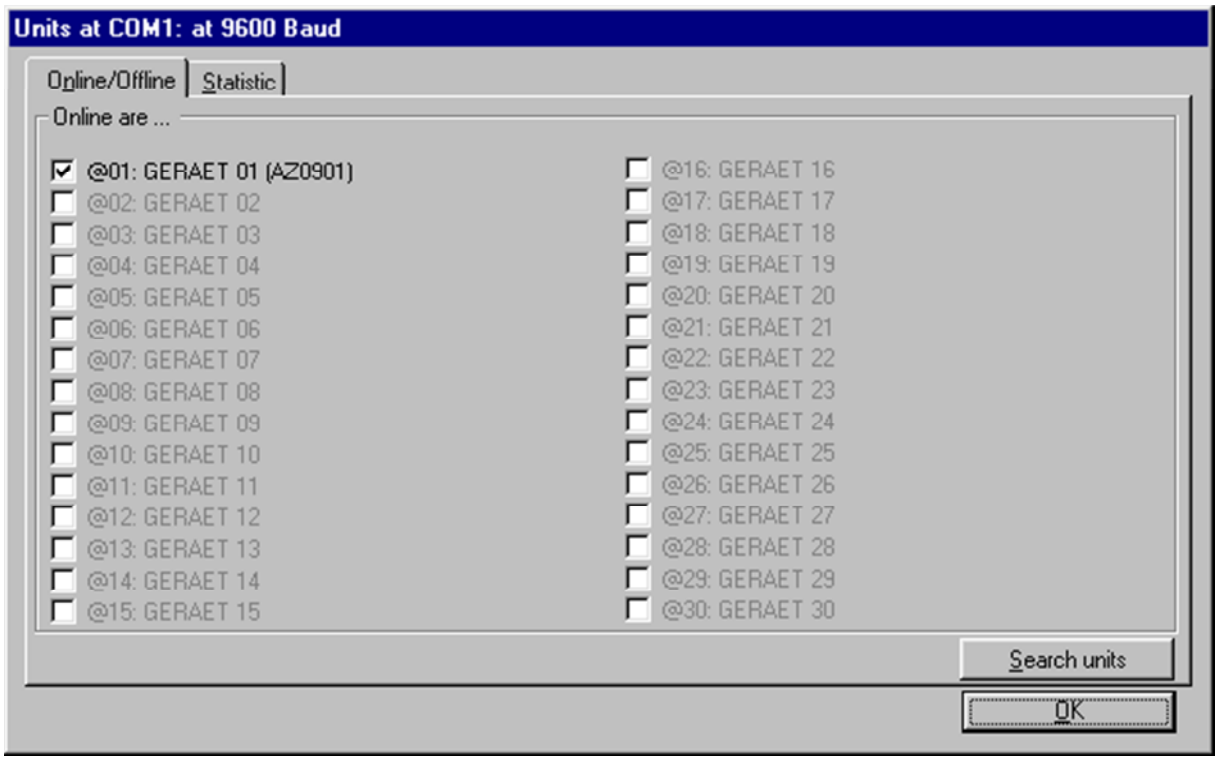
Save project as

The activation of FILE / SAVE PROJECT AS allows to save the actual project with another name. FECON starts with the new name of the project.

Delete project

The activation of FILE / DELETE PROJECT allows to delete a selected project completely.

Bus configuration (Online- / Offline selections of units)

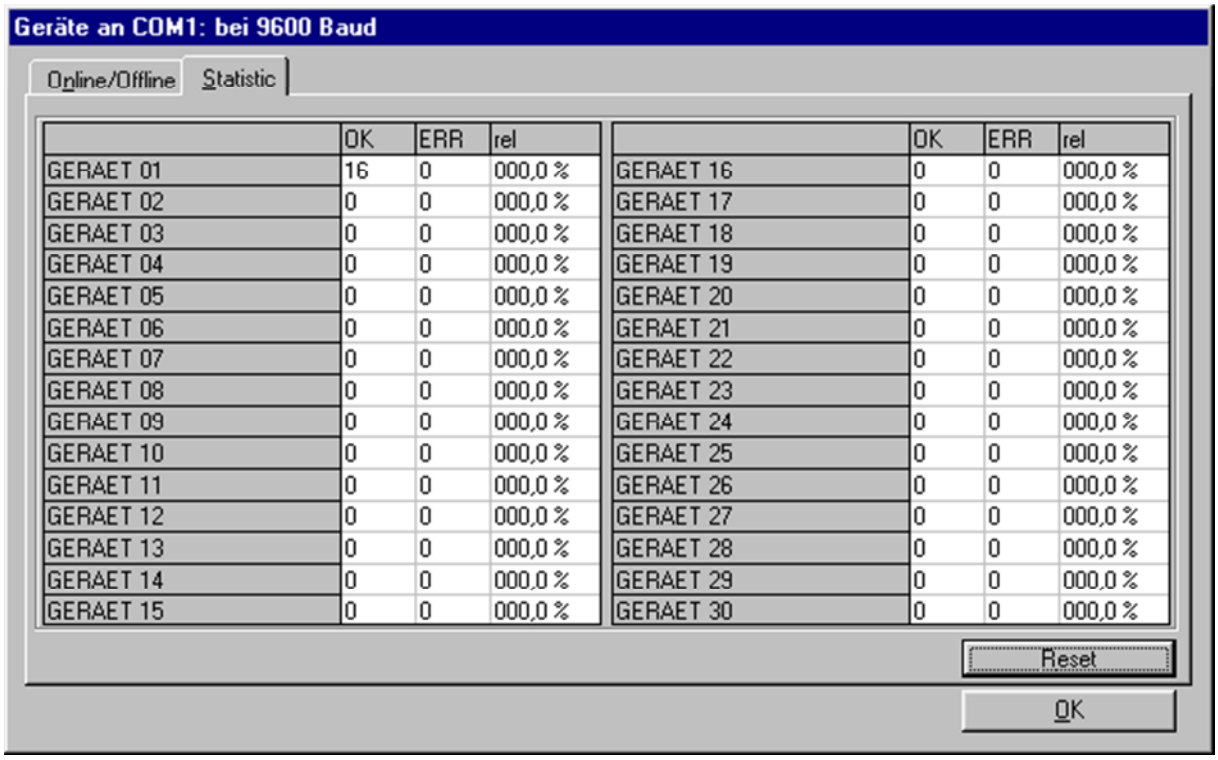


FECON may manage up to 60 linked units (according to the ordered licence) via a single interface. FECON adapts itself to the functions of the units. The program “learns“ these functions during the bus-setup. This is to find in the menu „FILE / PROJECT SETUP“.

Single units are to select manually in the bus-configuration by a click to the referring box. Selected units indicate the so called AZ-number (found firmware signification). Not required addresses remain empty. The button SEARCH UNITS activates the automatic identification.

Status of transmission quality

The viewer „statistic“ of the bus-setup opens a statistic chart of the transmission. The number of transmitted telegrams and errors are counted for each unit.



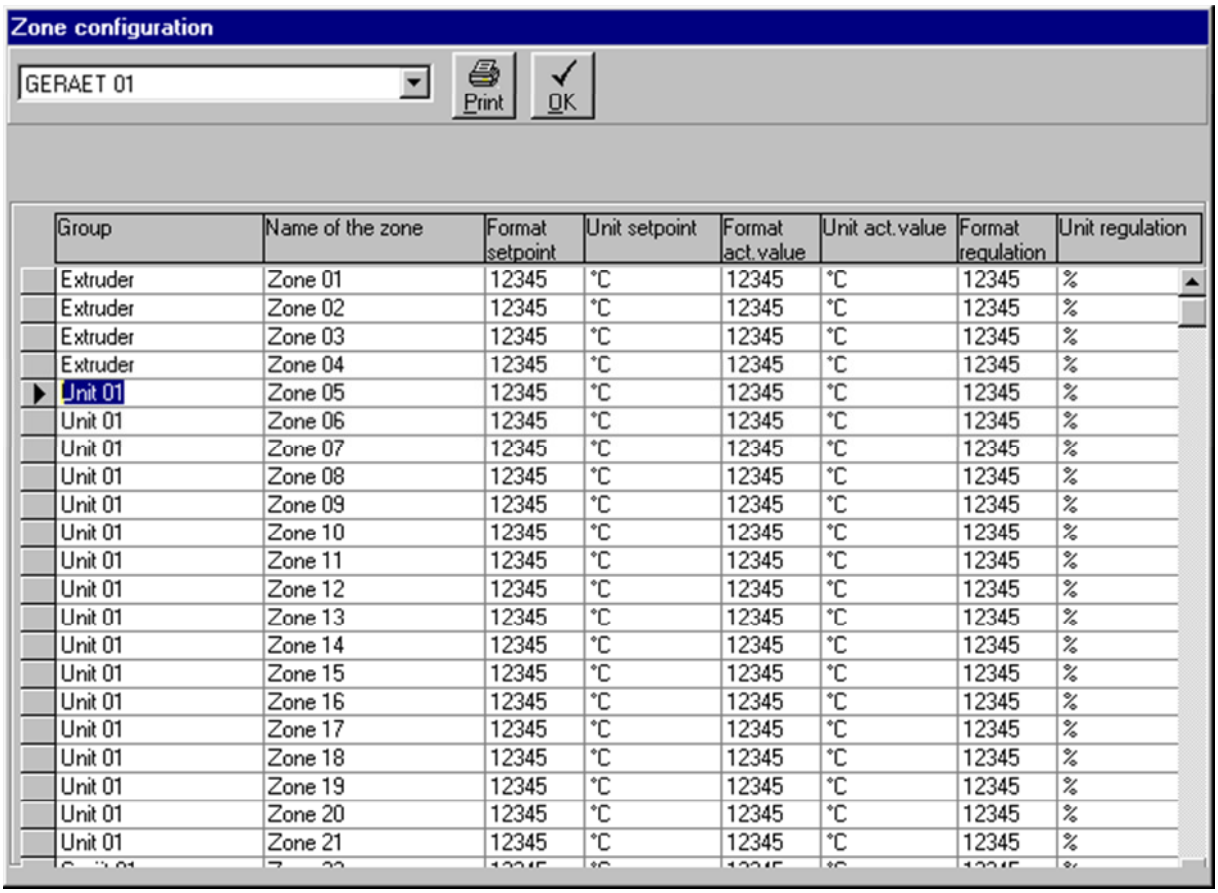
	OK	ERR	rel		OK	ERR	rel
GERAET 01	16	0	000,0 %	GERAET 16	0	0	000,0 %
GERAET 02	0	0	000,0 %	GERAET 17	0	0	000,0 %
GERAET 03	0	0	000,0 %	GERAET 18	0	0	000,0 %
GERAET 04	0	0	000,0 %	GERAET 19	0	0	000,0 %
GERAET 05	0	0	000,0 %	GERAET 20	0	0	000,0 %
GERAET 06	0	0	000,0 %	GERAET 21	0	0	000,0 %
GERAET 07	0	0	000,0 %	GERAET 22	0	0	000,0 %
GERAET 08	0	0	000,0 %	GERAET 23	0	0	000,0 %
GERAET 09	0	0	000,0 %	GERAET 24	0	0	000,0 %
GERAET 10	0	0	000,0 %	GERAET 25	0	0	000,0 %
GERAET 11	0	0	000,0 %	GERAET 26	0	0	000,0 %
GERAET 12	0	0	000,0 %	GERAET 27	0	0	000,0 %
GERAET 13	0	0	000,0 %	GERAET 28	0	0	000,0 %
GERAET 14	0	0	000,0 %	GERAET 29	0	0	000,0 %
GERAET 15	0	0	000,0 %	GERAET 30	0	0	000,0 %

Errors of transmission are no heavy faults, as they are recognized by the system ignored and repeated. In case of more than 4% of errors the quality of the interface should be checked. At the limit of the counter at 32000 the status will be frozen. “Reset” sets the status to zero; e.g. to check the interface after a change of wiring.

Zone configuration

After the installation all zones of the linked units are called "*Zone 01*"..."*Zone xx*". Each zone is defined with setpoint, actual value and output rate. The values are indicated without decimal point. This is sufficient in most cases. But an easy change of this default setting is possible during the operation with FECON:

The following dialog appears with the menu item „FILE / PROJECT SETUP / ZONES“:



Group	Name of the zone	Format setpoint	Unit setpoint	Format act.value	Unit act.value	Format regulation	Unit regulation
Extruder	Zone 01	12345	°C	12345	°C	12345	%
Extruder	Zone 02	12345	°C	12345	°C	12345	%
Extruder	Zone 03	12345	°C	12345	°C	12345	%
Extruder	Zone 04	12345	°C	12345	°C	12345	%
Unit 01	Zone 05	12345	°C	12345	°C	12345	%
Unit 01	Zone 06	12345	°C	12345	°C	12345	%
Unit 01	Zone 07	12345	°C	12345	°C	12345	%
Unit 01	Zone 08	12345	°C	12345	°C	12345	%
Unit 01	Zone 09	12345	°C	12345	°C	12345	%
Unit 01	Zone 10	12345	°C	12345	°C	12345	%
Unit 01	Zone 11	12345	°C	12345	°C	12345	%
Unit 01	Zone 12	12345	°C	12345	°C	12345	%
Unit 01	Zone 13	12345	°C	12345	°C	12345	%
Unit 01	Zone 14	12345	°C	12345	°C	12345	%
Unit 01	Zone 15	12345	°C	12345	°C	12345	%
Unit 01	Zone 16	12345	°C	12345	°C	12345	%
Unit 01	Zone 17	12345	°C	12345	°C	12345	%
Unit 01	Zone 18	12345	°C	12345	°C	12345	%
Unit 01	Zone 19	12345	°C	12345	°C	12345	%
Unit 01	Zone 20	12345	°C	12345	°C	12345	%
Unit 01	Zone 21	12345	°C	12345	°C	12345	%

At first the desired unit has to be selected referring to the unit address in the upper chart. The table shows each zone of the selected unit. Each zone belongs to a group and has its own name. The definition of groups enables to operate different parts of machines clearly arranged from a single control unit (see upper example).
Further settings for the size of setpoints, actual values and output rates are possible. The indicated numbers 12345 are examples for the positioning of the decimal point. The selection <…..> for the size of the values disables the indication. The unit of the value may be set unlimited. This is important in cases of measuring data .

With the button „OK“ or the change to an other unit all settings are valid without a restart of FECON.

Faceplates

A faceplate presents a single zone and includes a „minitrend“. Several faceplates may be collected to a page of faceplates (→ Faceplate layout). Up to 30 of these pages of faceplates may be selected by the menu.

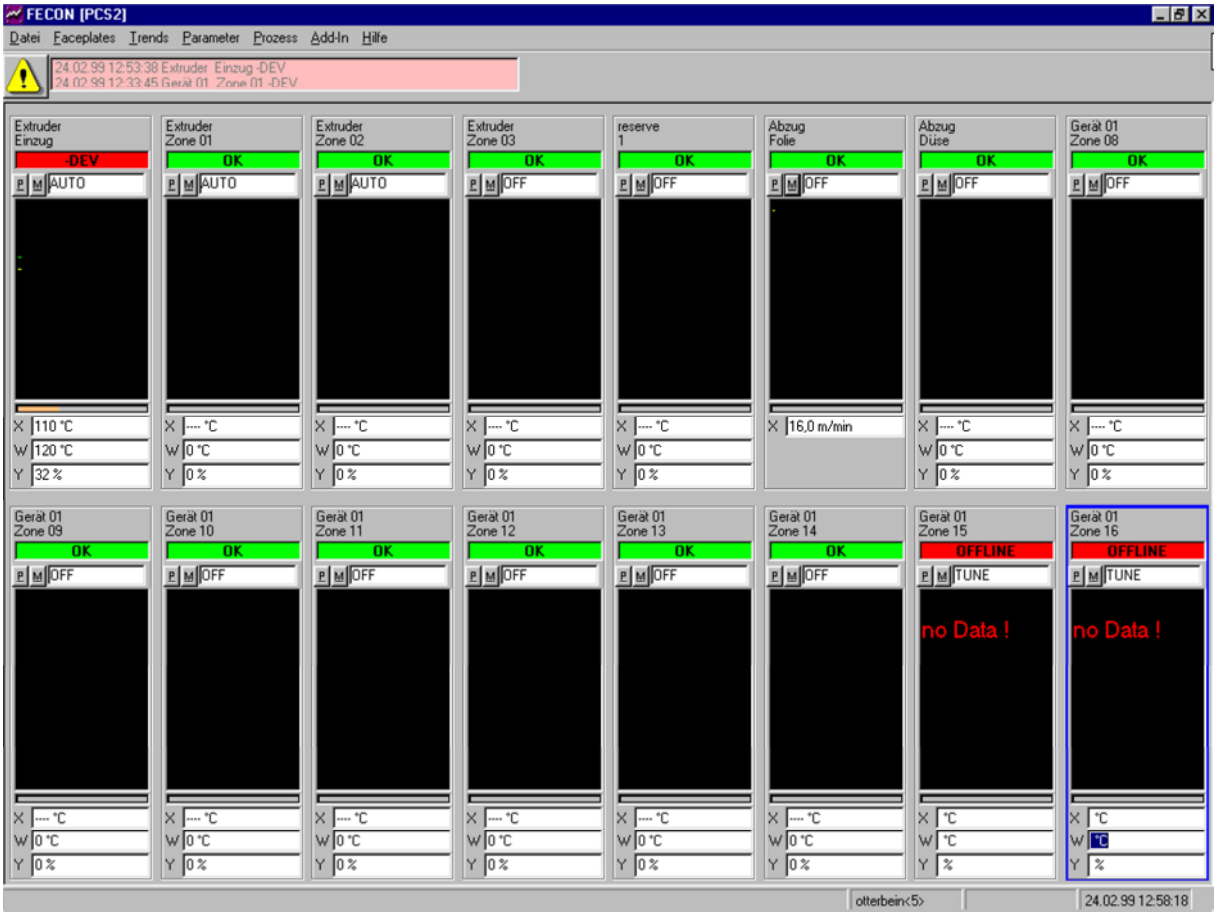


Abb.: Example of a page of faceplates.

Structure of a faceplate

Each faceplate presents (beginning on top)

- Name of the zone (names of group and zone)
- Status of the zone (OK or referring alarm report in red)
- Operation mode of the zone (MANUAL / AUTO / OFF / TUNING)
- Parameter mode via the small P - button
- Selection of the operation mode via the small M - button
- Minitrend indicating the actual value (yellow curve) and the setpoint (green curve)
- Bar graph below the trend for the output rate (red = heating, blue = cooling)
- Below all the values in figures: X = actual value W = setpoint Y = output rate. Setpoint and output rate may be set from here.

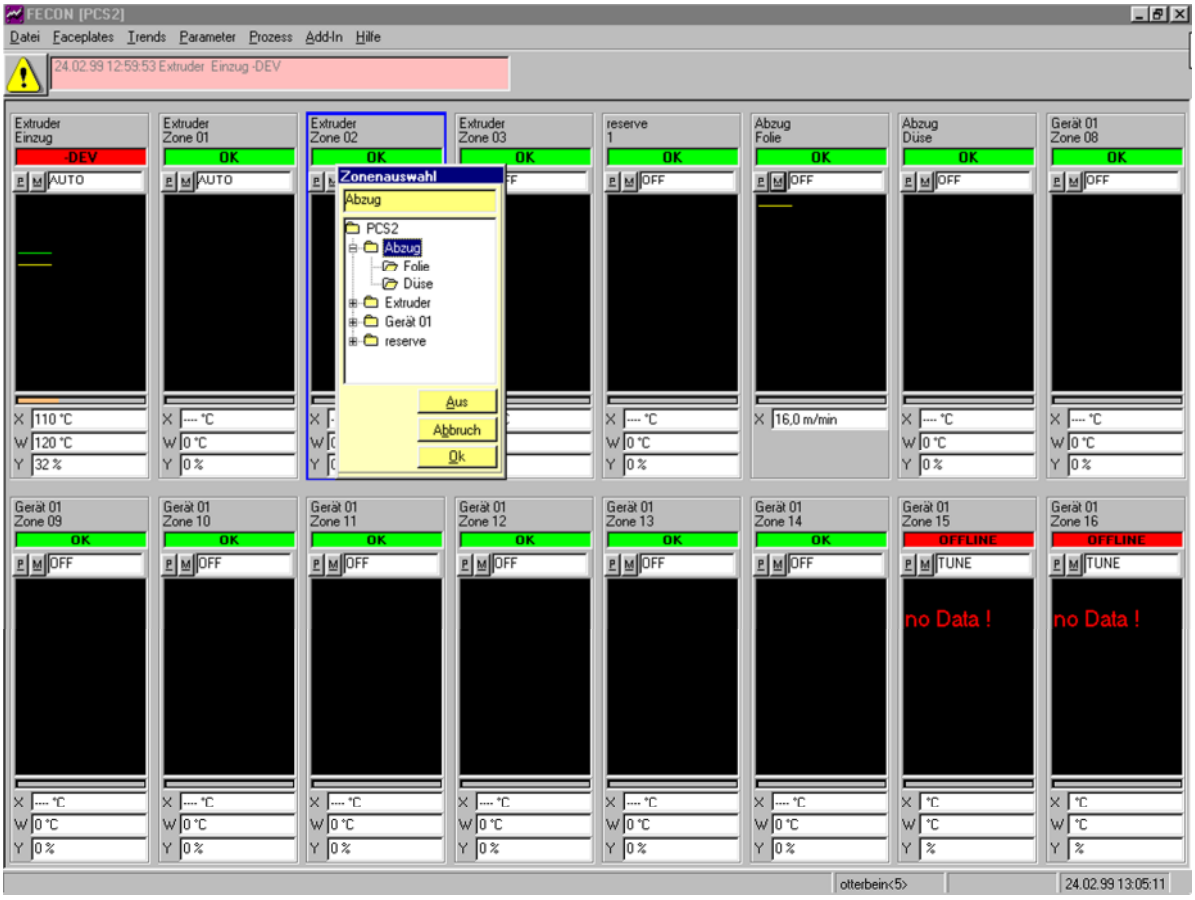
The example above shows how to disable the setpoint and the output rate of the zone "ABZUG - FOLIE" according to the → Zone configuration.

Operation of zones via faceplates

A faceplate must be selected by the cursor. The selection will be indicated by a blue frame. Now there are different settings allowed. The setpoint of a zone may be changed, if it is in control mode. The output rate may be changed, if the zone is in manual mode. The operation mode of the zone may be changed via the input of ALT-M or the small M-button in the faceplate. A selection window opens, which presents the possible operation modes.
The input of ALT-P or the small P-button in the faceplate enables a quick setting of parameters of the zone. The minitrend will be covered by a chart of valid parameters for this zone. The click on to a parameter opens a further window that allows the setting of values.

Composing faceplates

A page of faceplates includes an individual number of faceplates. Which one of the zones will be put together in one page may be selected by a double-click to the name of the referring faceplate:

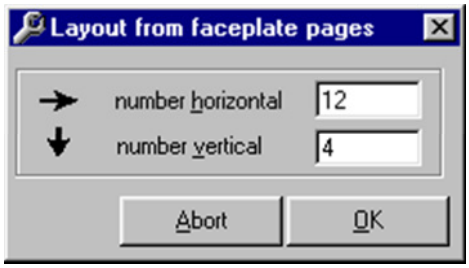


A window opens the selection with all zones of the defined project. The zones are arranged in groups. The selected zone will be put into the referring position of the page of faceplates by the “OK” button.

The "Off" button disabled the referring zone and a simple cover appears. This may be useful to separate zones. This zone will not be turned off!!

Arrangement of faceplates: number of faceplates per page

The number of faceplates in horizontal and vertical directions is to set in the menu FILE / PROJECT SETUP / FACEPLATE LAYOUT. The following dialog allows to put up to 64 faceplates on one page.



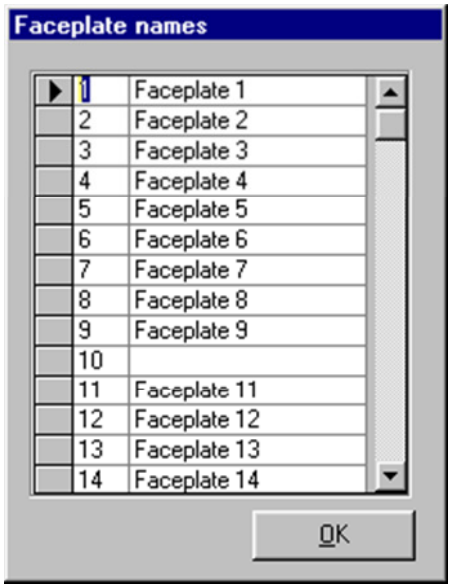
The more faceplates are put on one page, the smaller is the indication of each. The number of faceplates that are available in horizontal and vertical directions depends on the resolution of the graphic board in the computer.

After „OK“ an actual page of faceplates will be deleted from the screen. It has to be activated again via the faceplate menu. <u>These settings are valid for all pages of faceplates!</u>

Names of pages of faceplates

The menu item FILE / PROJECT SETUP / FACEPLATE NAMES allows to enter names for the pages for a better survey. The names of the faceplates are directly used in the FACEPLATE menu.

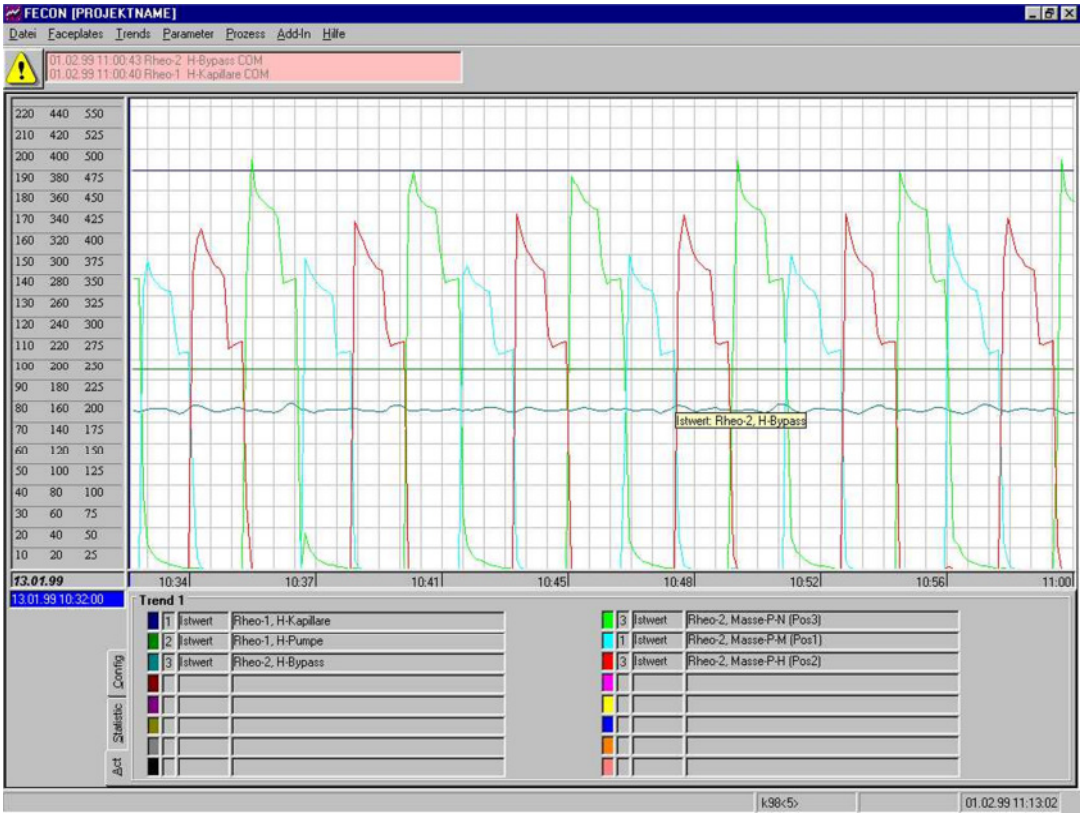
Up to 30 pages of faceplates may be defined. For a better survey the selection may be reduced. All following pages will not be indicated if the name of one page will be deleted from the chart. (The example will enable only the pages 1..9 for the menu).



Trends (curve diagrams)

General

The trends show the temporal diagrams for the measured data.



Max. 16 curves are available for each trend. Up to 30 trends may be defined, which are selectable in the main menu TREND.

Configuration of trends

Selection of the desired zone

The colours of the curves in the trend diagrams are preset like the systems of multichannel printers. The user may define certain zones for these colours. A double click in the long section beside the colour opens the chart of zones, like the → configuration of faceplates, to select the desired zone.
The value appears in the white section. The section on the left beside the name of the zone allows to select between actual value, setpoint, output rate and difference (set –actual) for the referring zone. Beside the colour section a number declares, which of the three axes belong to this value. 1=left axe, 2=mean axe, 3=right axe.

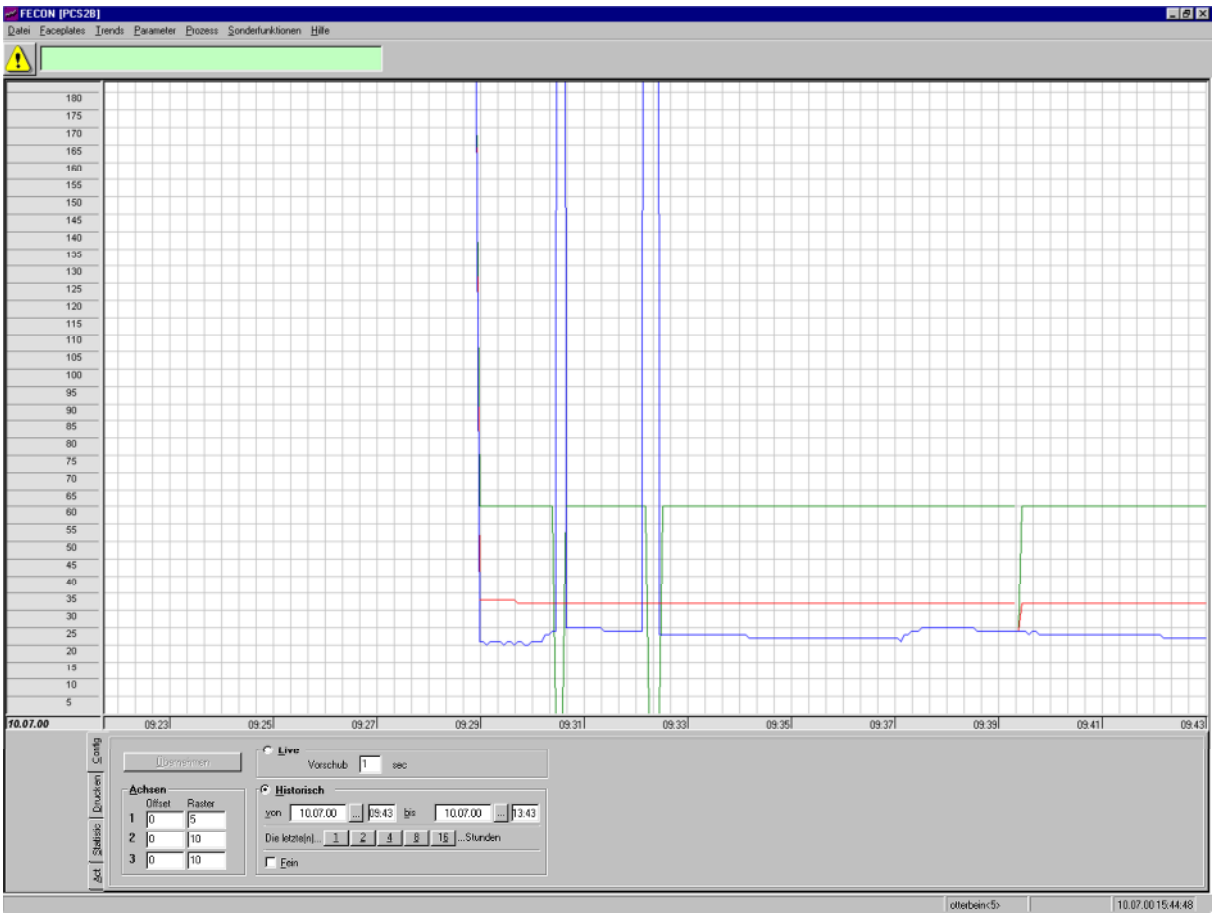
After the selection of the zones the axes for time and values may be defined via "CONFIG".

Settings for the value axes

The windows OFFSET and GRID allow to configure the value axes. The definition for offset is the lowest value of the axes. The grid is the vertical distance between two values of the axes. Three different axes may be configured. The axes have the numbers 1 to 3 from the left to the right.

Settings for the time axes

LIVE
There are two possibilities to indicate a trend, „Live“ or „Historic“. The live indication is without any delay. “Live” has to be selected. The size and the speed of the actualisation has to be set by „Time axis“.



HISTORIC
The historic indication is the alternative trend for historic values. “Historic” has to be selected and the desired time period must be defined. Some buttons for the last hours allow a fast selection for the past time.

The activation of “FINE” enables an indication of each measured value. The build up of the curve may need longer time according to the size of the time axis. Otherwise only some of the saved values are used for the curveto allow a faster buid up. This way extreme peaks can be ignored

Time scale

The historic indication allows to open a vertical time scale with a click into the diagram. A blue line appears in the diagram and may be moved with the pressed mouse key. The sections for measured values indicate the according values of the actual time scale.

Two lenses appear together with the time scale. They allow to zoom into (+) or out (-) of the actual period.

During the indication of the blue time scale a click at the left or right end of the diagram will move the time period without any new settings FROM / TO for the period.

Statistics

There is a section „Statistics“ below the diagram. The following values of the zone are indicated here:

- Minimal value of the referring zone
- Maximal value at the according time
- Average, arithmetic mean (avg)
- Standard deviation (S)
- Number of calculated values for the statistics (n)

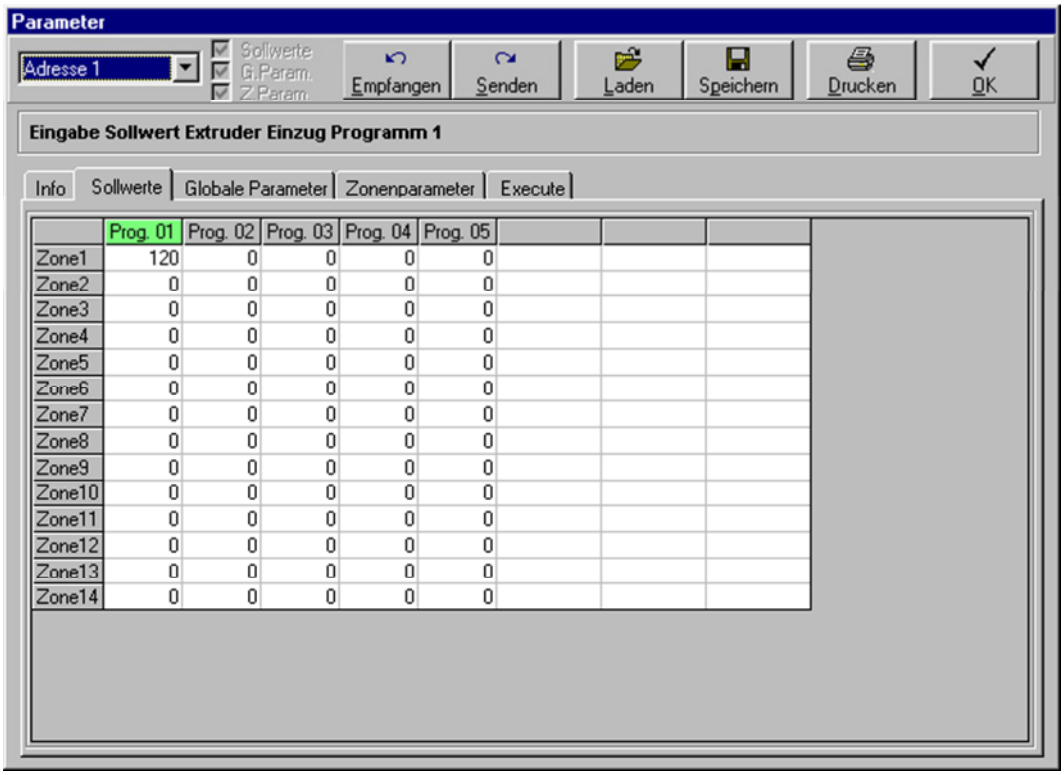
Print

Different printings of a diagram are available via the button „PRINT“. The diagram may be printed in curves or in a table of values. The selection allows the standard printer, a copy to the clip board or a simple preview.

The used dialogues and settings declare itself and are not described here.

Setting parameters for the units

The menu PARAMETER opens the following dialogue. It enables all settings of the units. The required unit has to be selected on top on the left.



	Prog. 01	Prog. 02	Prog. 03	Prog. 04	Prog. 05
Zone1	120	0	0	0	0
Zone2	0	0	0	0	0
Zone3	0	0	0	0	0
Zone4	0	0	0	0	0
Zone5	0	0	0	0	0
Zone6	0	0	0	0	0
Zone7	0	0	0	0	0
Zone8	0	0	0	0	0
Zone9	0	0	0	0	0
Zone10	0	0	0	0	0
Zone11	0	0	0	0	0
Zone12	0	0	0	0	0
Zone13	0	0	0	0	0
Zone14	0	0	0	0	0

A click to referring folder opens a selection of values that may be changed. “INFO” contains stable values of the status. “SETPOINTS” contains the setpoints of the zones and hidden values of the setpoint programs possibly. “GLOBAL PARAMETERS“ allows basical settings for the unit and „ PARAMETERS“ allows to change the settings of single zones. “EXECUTE“ allows to start different unit functions like „reset default parameters“. This way the unit will be reset to the original status.

With the first click to one of the folders the data will be transferred from the unit to the PC. The values will be changed in the table on the PC. Changed values appear with a yellow background. The F10 key allows to copy values into the lower section for columns with equal values. The changed values will not be sent directly to the controller! Only the button “SEND” will start this. The transfer will be checked automatically. The referring sections will be indicated in red, if the transfer had failed.

A click to “RECEIVE” gets a new status of values from the unit. His is required after the reset to default settings.

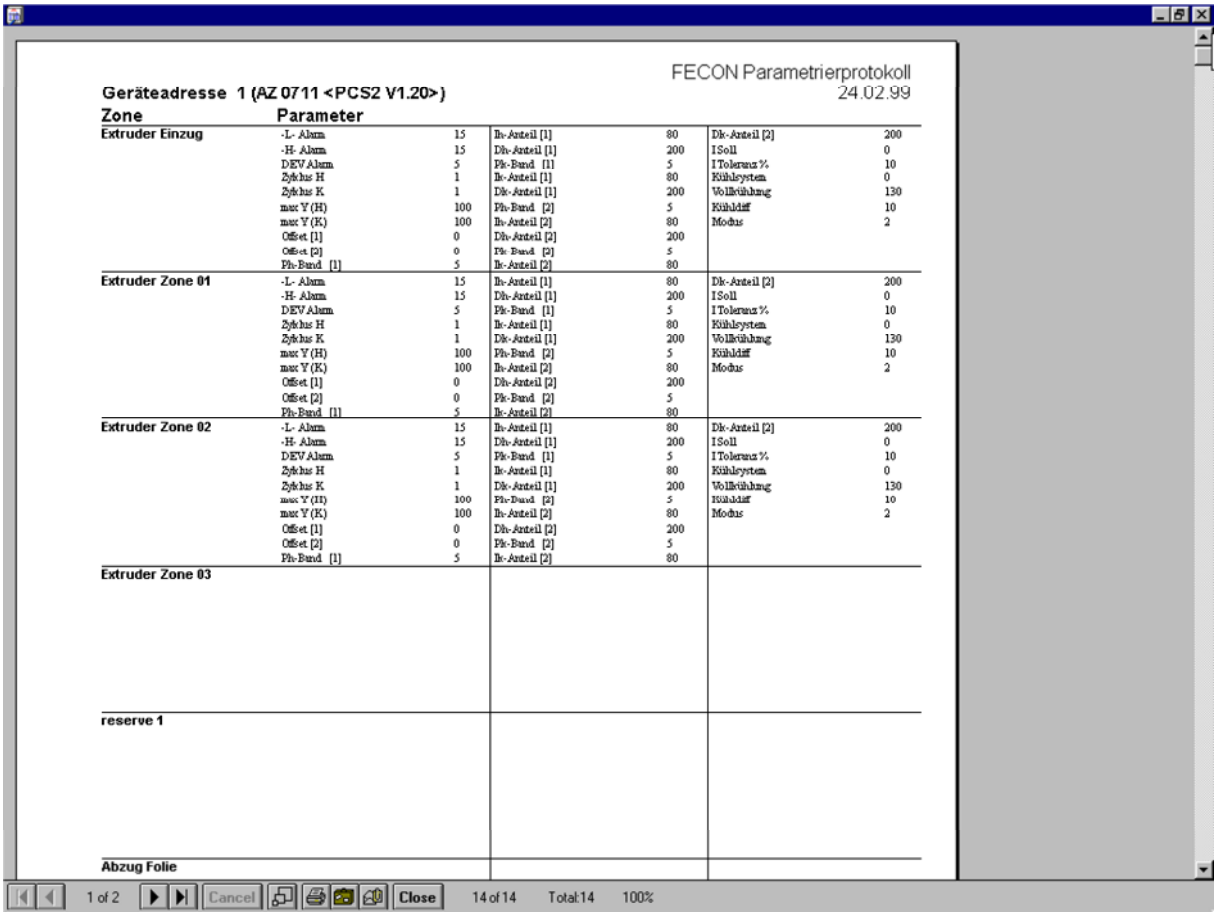
Parameter recipes

All individual settings for a unit can be stored in “recipes” on the hard disc of the PC with the button “SAVE”. A comment enables a comfortable recognition of the recipe.

„LOAD“ opens a recipe on the PC. The mix of recipes with different types of units is not possible. Only the same type of units may be loaded with the same recipes.

After the load of a recipe the data have to be sent from the table to the unit. Deviating values are indicated by the yellow background.

Print parameters



A preview on the screen, like the picture above, enables a print of all parameters of a unit. A click to the printer-icon in the symbol line starts the print. A click to the case-symbol allows to export the file in selected format /WORD, EXCEL...).

Switchclock

The switchclock allows to activate certain actions at a certain time. The time table can be configured very flexible. The action may be set for a single action or repeated in a certain cycle.
Each action of the switchclock is called „job“ in the following. Up to 100 different jobs can be defined. After a click on „New“ and the definition of a job name the action of the job (what to do?) may be selected.

The action may be selected by a pulldown menu. Actually the transmission of setpoints, parameters and the activation of process picture recipes is included. Further switchclock actions are planned.

The box „switchclock active“ allows to switch the functions of the switchclock on or off. An alarm clock is indicated in the status line of the main screen in case of an active switchclock.

The protocol window indicates the results of the jobs and the (possible) errors.

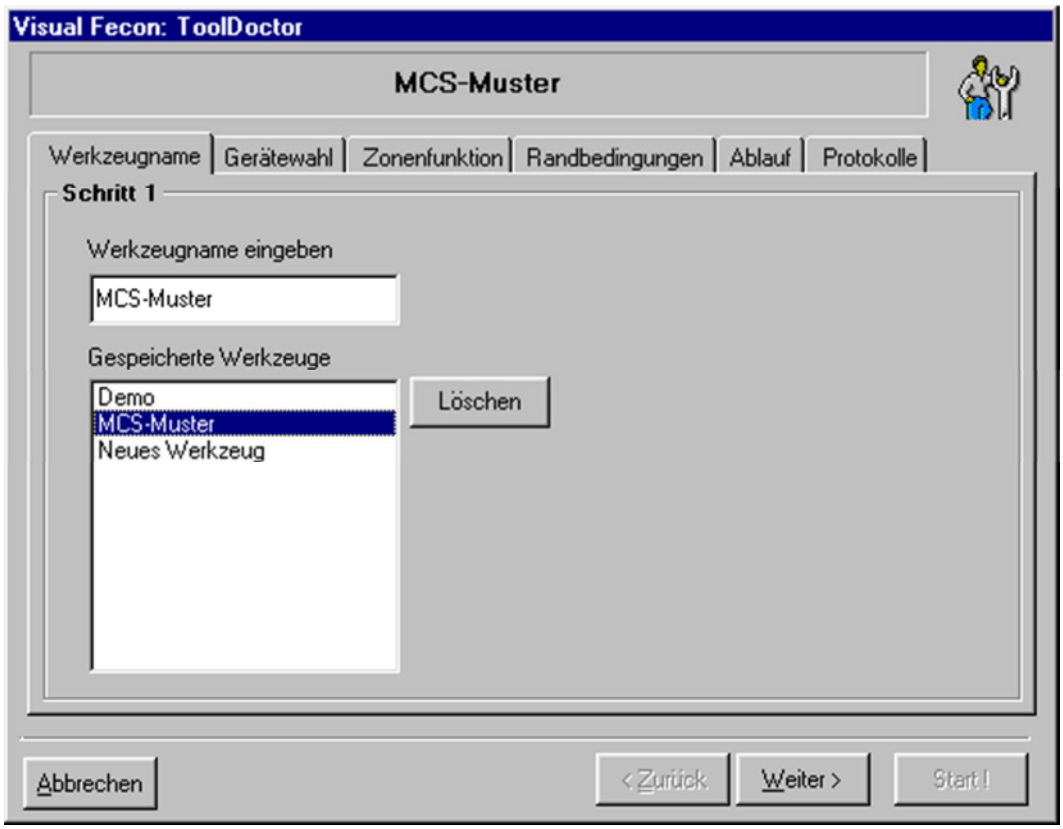
ToolDoctor (Option)

The ToolDoctor is available in a separate module. It helps to recognize faults in the wiring of heaters and sensors automatic during the commissioning. It was designed specially for the requirements of the plastic injection molds, where several changes of tools are necessary for the production.

The activation of the ToolDoctor is recommended before each start or restart of a tool, to recognize faults as soon as possible.

The simple and comfortable dialogs for the operation of the ToolDoctor are explained in the following:

Step 1: Tool management

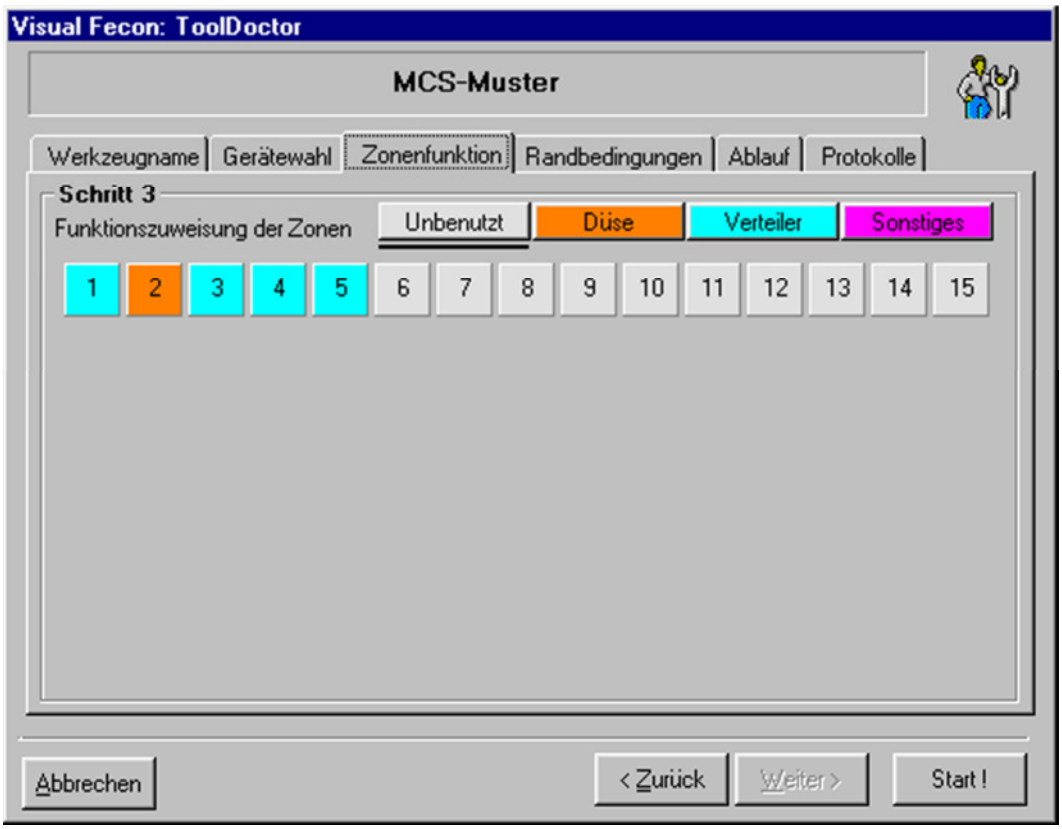


The required parameters are stored according to the tool. This saves the following tasks for a tool. Enter the clear name for the tool or the machine or select it from the stored tools by step1.

Step 2: Selection of the controllers

Here the controllers have to be selected, that heat the connected tool.
For MCS pay attention to select all installed racks of the unit.

Step 3: Affiliation to the zone function



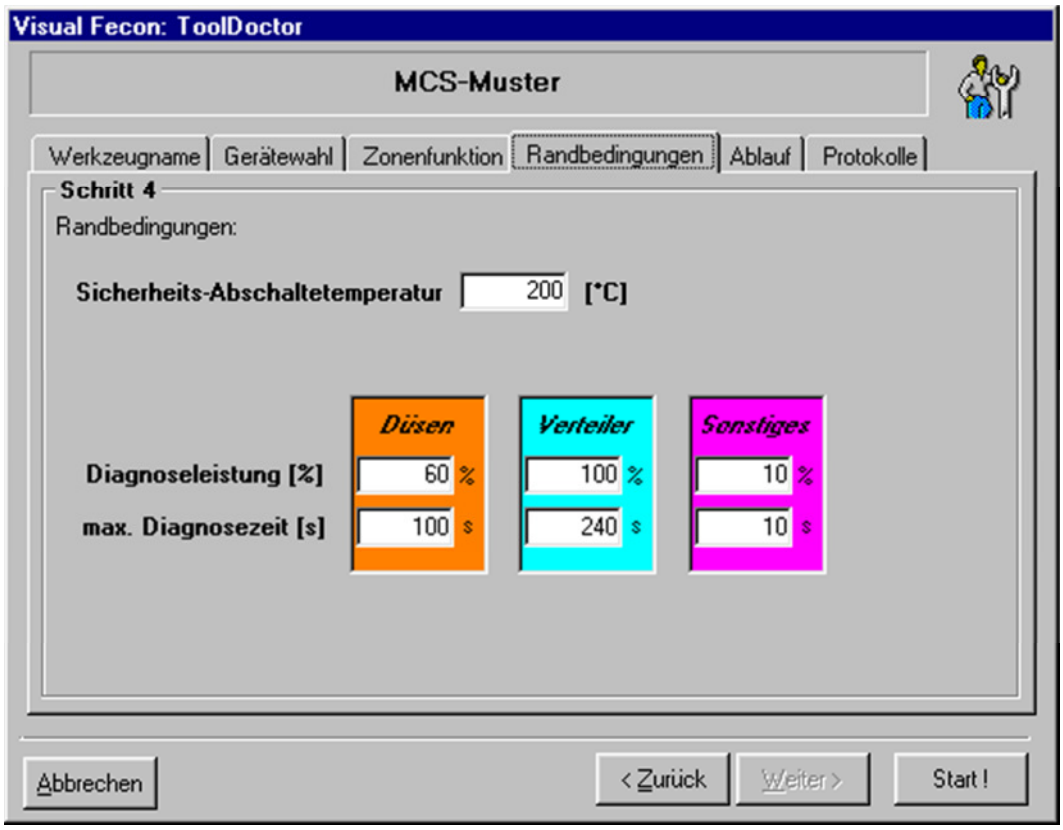
Normally a tool exists of zones with different heating conditions. The ToolDoctor defines three groups of functions of heater zones.

This step the user defines the function of the zone. The names for “NOZZLE”, MANIFOLD“ and „MISCELLANEOUS“ are preset. The definition “NOT USED“ disables the diagnosis for the referring zone.

The left mouse key defines the function of the zones that are shown with the symbols 1..15 in the picture above. The selected function appears underlined („NOT USED“ in the picture above). Then the pressed left mouse key passes the zone to define it. The defined zone changes to the referring colour.

After the definition of all zones the next step follows.

Step 4: Set parameters of the zone functions



This step allows to set safety limits for temperatures. If one temperature exceeds this temperature, during the diagnosis, the unit will turn off all zones and stop the ToolDoctor.

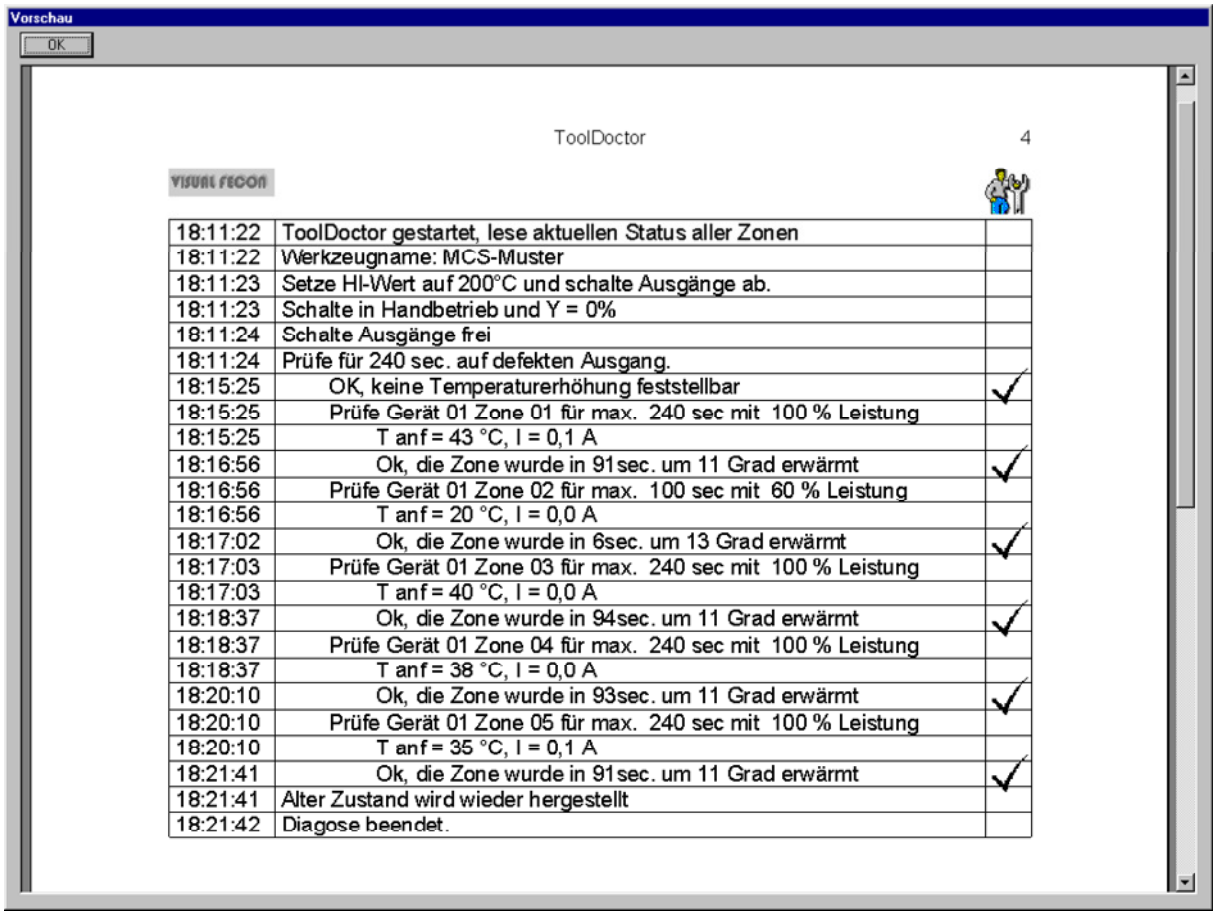
Finally the limits for diagnosis power and time have to be set for each group.

The zone must be able to reach an increase of 10K temperature within the selected time!

Step 5: Sequence

The sequence of the diagnosis runs automatically. The single steps are indicated on the screen. No settings are required.

Step 6: Protocol



18:11:22	ToolDoctor gestartet, lese aktuellen Status aller Zonen	
18:11:22	Werkzeugname: MCS-Muster	
18:11:23	Setze HI-Wert auf 200°C und schalte Ausgänge ab.	
18:11:23	Schalte in Handbetrieb und Y = 0%	
18:11:24	Schalte Ausgänge frei	
18:11:24	Prüfe für 240 sec. auf defekten Ausgang.	
18:15:25	OK, keine Temperaturerhöhung feststellbar	✓
18:15:25	Prüfe Gerät 01 Zone 01 für max. 240 sec mit 100 % Leistung	
18:15:25	T anf = 43 °C, I = 0,1 A	
18:16:56	Ok, die Zone wurde in 91sec. um 11 Grad erwärmt	✓
18:16:56	Prüfe Gerät 01 Zone 02 für max. 100 sec mit 60 % Leistung	
18:16:56	T anf = 20 °C, I = 0,0 A	
18:17:02	Ok, die Zone wurde in 6sec. um 13 Grad erwärmt	✓
18:17:03	Prüfe Gerät 01 Zone 03 für max. 240 sec mit 100 % Leistung	
18:17:03	T anf = 40 °C, I = 0,0 A	
18:18:37	Ok, die Zone wurde in 94sec. um 11 Grad erwärmt	✓
18:18:37	Prüfe Gerät 01 Zone 04 für max. 240 sec mit 100 % Leistung	
18:18:37	T anf = 38 °C, I = 0,0 A	
18:20:10	Ok, die Zone wurde in 93sec. um 11 Grad erwärmt	✓
18:20:10	Prüfe Gerät 01 Zone 05 für max. 240 sec mit 100 % Leistung	
18:20:10	T anf = 35 °C, I = 0,1 A	
18:21:41	Ok, die Zone wurde in 91sec. um 11 Grad erwärmt	✓
18:21:41	Alter Zustand wird wieder hergestellt	
18:21:42	Diagose beendet.	

All diagnosis protocols of a tool are stored on the hard disc. These are easy to select in step6 for a preview on the screen or for a printer.

Successful steps are marked with a hook. Problems during the diagnosis get a yellow triangle.
This way the result of the TOOLDOCTOR appears for a check.

Process pictures

General

Process pictures allow the survey of the process values together with the referring graphic of the plant. The example from above shows the photo of an extruder with the overlay for the indication of actual temperatures of the four heating zones.
A click to the indicated values opens a → Faceplate that enables the operation of the zone.
In case of alarm a red background appears behind the values.

The open interface allows an individual selection of implemented graphics. The number of pictures is limited to 999.

Installation of process pictures

Each single process picture exists of two files. The**.BMP** file with the static bitmap and the **.INI** file, that stores the indicated process values.
The bitmap file may be created by any available picture program. The .INI file may be arranged by a simple ASCII-editor or by the integrated ToolBuilder. The files are to find and to save in the project folder “PROCESS”.
The form of the file names is fixed with "BILD*xxx*.BMP" und "BILD*xxx*.INI". The *xxx* is the number of the process picture. The first activation of the process pictures opens the **BILD000**. So this picture could be defined as a start picture with an survey of the plant. Other pictures are to start from here. An empty screen appears, if there is no file BILD000.BMP.

ToolBuilder

Above the process picture appears a button „CONFIG“, if the user was registrated with the user level 5. A click to this button activates the integrated „ToolBuilder“. This function allows to configure individual process pictures.

The menu ELEMENT / NEW allows to implement new elements into the picture:

Text

TEXT allows to open static texts in different sizes. The activation puts the text „FECON“ into the picture. This may be placed by DRAG AND DROP with the mouse. Alternatively the location has to be set manually via the ToolBuilder window. Even the text may be changed this way.

Value

VALUE opens the overlay to integrate measured values from the unit into the process picture.

Therefore the internal system-address of the process value is required. This is a number of 8 figures with a dot after the first 4 figures. These 4 contain the bus-address and the number of the zone (0301 = bus-address 3, zone number 1). The figures after the dot contain the demanded value.

0001..
0099 = Parameter according to the unit manual,
0000 = Setpoint,
1000 = Actual value,
1001 = Difference
2000 = Status in text
2001 = Status in numbers
3000 = Output rate,
4000 = Heater current

Action field

The ACTION FIELD allows to define sections in the picture, that lead to other process pictures. The number of the referring picture has to be set by the ToolBuilder. The size of the section may be fixed via Drag & drop with the mouse.

Input field

An Input field is able to store information from the user until the next activation of the referring picture without any reaction for the process.

TCP/IP Link

From version 1.0.47 Fecon is able to provide all process values via a TCP/IP interface as well as send to the units via the RS485-bus in the lower level. This way each FECON-Version gets to a TCP/IP server for measured values.

Conditions: TCP/IP has to be configured in Windows!!!

The menu item FILE / CONFIGURATION allows to start this service in the section „TCP/IP“.

TCP/IP Protocol

FECON is available for a connected computer via Ethernet by the TCP/IP port “8070”. P to 20 computers may be linked for simultaneous communication.
It is a clear ASCII protocol. Each telegram has to be finished with CR + LF. For debugging and test the program TELNET may be used. This belongs to the MS Windows standard. The telegrams have to be entered like a termnal.

For programmers in VISUAL BASIC (VB5 / VB6) there is a small programmed example available. This may be delivered together with source code on request.

The actual version includes the folowing orders:

Order	Function	Example
?	Help. Fecon answers with the actual available orders.	
BUS*Telegramm*	The referring telegram (without checksum!) will be transmit via the RS485 bus and the answer of the units will be returned. The bus transmission inhibits the demand cycle of FECON for a certain time. Therefore minimize the use!	BUS G01K03P00=0050 Sets the setpoint of unit 1, channel 3 to 50
GET *ggkk.pppp*	Demands from the unit with the address *gg* for parameter *pppp* of the channel *kk* . Valid for *pppp* : 0001..0099 = Parameter ref. to manual 0000 = Setpoint, 1000 = Actual value, 1001 = Difference 2000 = Status in text 2001 = Status in value 3000 = output rate, 4000 = heater current, 5000 =Group- & zone name 5001 = Group name 5002 = Zone name 5003 = Unit name	GET 0103.1000 Takes the actual value from zone 3 of unit1. In opposite to **BUS** the values will be taken from the „CACHE“ of FECON. These answers are much faster.
GETZONE ggkk	Demands the process values actual value, setpoint status and output rate from a zone (address gg, channel kk) together.	GETZONE 0105 Answer e.g. 0100 0100 OK 3

END	Finishes FECON.	-
REBOOT	Finishes FECON and reboots the computer.	-
DOWN	Finishes FECON and turn the computer off.	-
USER	Demands the actual user and his user level	USER Answer USER feller 5:
USER *username password*	Defines a user. Password is required!	USER FELLER FECON
TIME	Demands the actual time	-
DATE	Demands the actual date	-
LIST *filename*	Lists the referring file	**LIST** c:\autoexec.bat
START *filename*	Starts the referring file on the FECON computer	**START** CALC.EXE
SENDKEY key	Sends a sequence of keys to the previous started application	
BS	Demands the transmission status of the linked units. The answer includes the name of the units, the number of transmissions and the error-transmissions.	
PROJECT	Answers with the name of the activated project.	
VER	Demands the version of FECON	
SN	Demands the serial number of FECON	

Technical data

System requirements

- PC with Windows 95, 98 or Windows NT 4.0.
- Pentium with minimum 200MHz and 32MB RAM
- Hard disc with minimum of 20MB available memory, 8MB additional for each saved day
- Graphic board with a resolution of minimum 800x600 pixels
- One available serial port to link the units