



Envirotronics®

Operating Manual

Touchpanel 8" Control Unit

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1 INTRODUCTION

1.1 General information

For installation and operation of the test device there is the operating manual for the device, and this operating manual for the *Touchpanel 8"* control unit.

- To avoid malfunctions and resulting damages, read and heed the operating manual for the device and this operating manual prior to startup.

1.1.1 For your information

The symbols and danger warnings used in this operating manual have the following meanings:

1.1.1.1 Symbols

- A dash is used for enumerations.
- Instructions for the operator and operating company are indicated by a dot.
- Cross-references are indicated by an arrow.

1.1.1.2 Danger warnings

consist of an explanatory remark with a symbol right next to it.



DANGER

is used in instances where any failure to comply with instructions could endanger human or other life or might pose a threat to the environment.



WARNING

is used in instances where any failure to comply with instructions could cause damage to the device or its load.



NOTE

is used to draw attention to a piece of advice.

1.1.2 Safety instructions

All safety instructions given in the device operating manual must be complied with.

1.1.3 Setting the basic configuration¹⁾

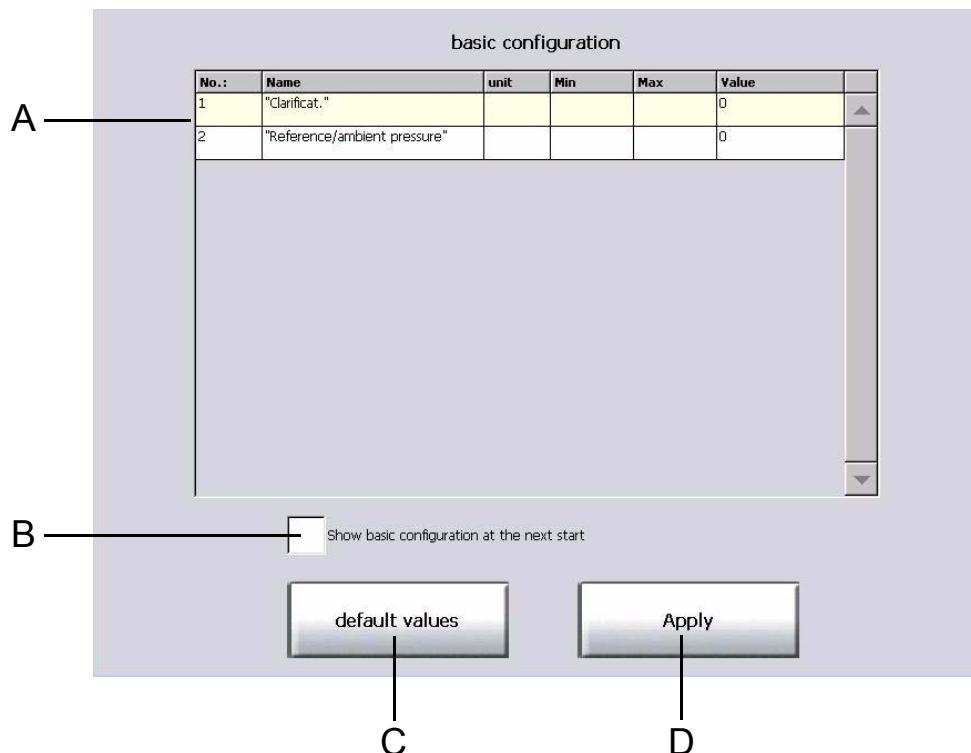
Devices that have high security requirements will cause the basic configuration menu to open automatically when the device is switched on.

The basic configuration menu can be used to specify various parameters for the device. For a description of the parameters please refer to the device manual.

The language selection menu appears.

- Select the desired language by clicking on the corresponding flag.

The configuration menu appears:



*Fig. 1-1
Basic configuration*

- A Basic setting values
- B Display the configuration menu when starting the control unit
- C Reset values to factory settings
- D Transfer entries
 - Adjust the displayed basic values according to your requirements.
 - Selecting the value to be changed causes the entry menu to appear.
 - Press »Apply« to transfer the set values.

**NOTE**

If the basic configuration menu does not appear automatically the next time the control unit is started, the »Show basic configuration at the next start« check mark is to be removed.

- If you want to restore the factory settings, press »default values«.

**NOTE**

If you want to change these settings at a later date, access the corresponding menu by selecting »Settings«, »Configuration«, »More settings« and »More settings« again → 3.2.4.1 (Page 33).

1.1.4 Online Help

The operating manual and the online help complement each other → 2.6 Device information (page 13).

Hotline - Tel. No. 1-800-368-4768

1.2 Description

Operation, monitoring and documentation of the device employ a 8" touch display. The software is available in several languages.

The software contains the following functions:

- Control and monitoring of the device
- Conducting tests in manual mode and program mode
- Creating programs
- Error messages display
- Trend graphics display

1.3 TFT Touch Display

Entries on the touch display are made either with a finger tip or with a touch pen.



WARNING

To prevent scratches on the surface, do not use any sharp-edged objects, such as ball pens, keys, rings, coins or cutlery.

1.3.1 Cleaning the control unit's touch surface

Use a clean cloth and standard glass cleaner to clean the surface of the touch display. Do not spray the glass cleaner directly onto the surface of the touch display; apply it to the cloth instead and wipe it across the surface.



WARNING

Do not use abrasive cleaning agents!

If you wish to clean the surface of the touch display during operation, press in the menu »Settings« the button »Configuration«, »More settings« and once again »More settings« → 3.2.4.1 (Page 33) the button . The surface is disabled for 5 seconds for cleaning.

2 AN OVERVIEW

The basic menu is the starting point for all functions. You reach various submenus from here and can switch on the light in the test space, view the test cabinet's operating status and call up the help functions. Further information about the basic menu and submenus is available in Chapter → 3 Basic menu (page 17).

2.1 Basic menu

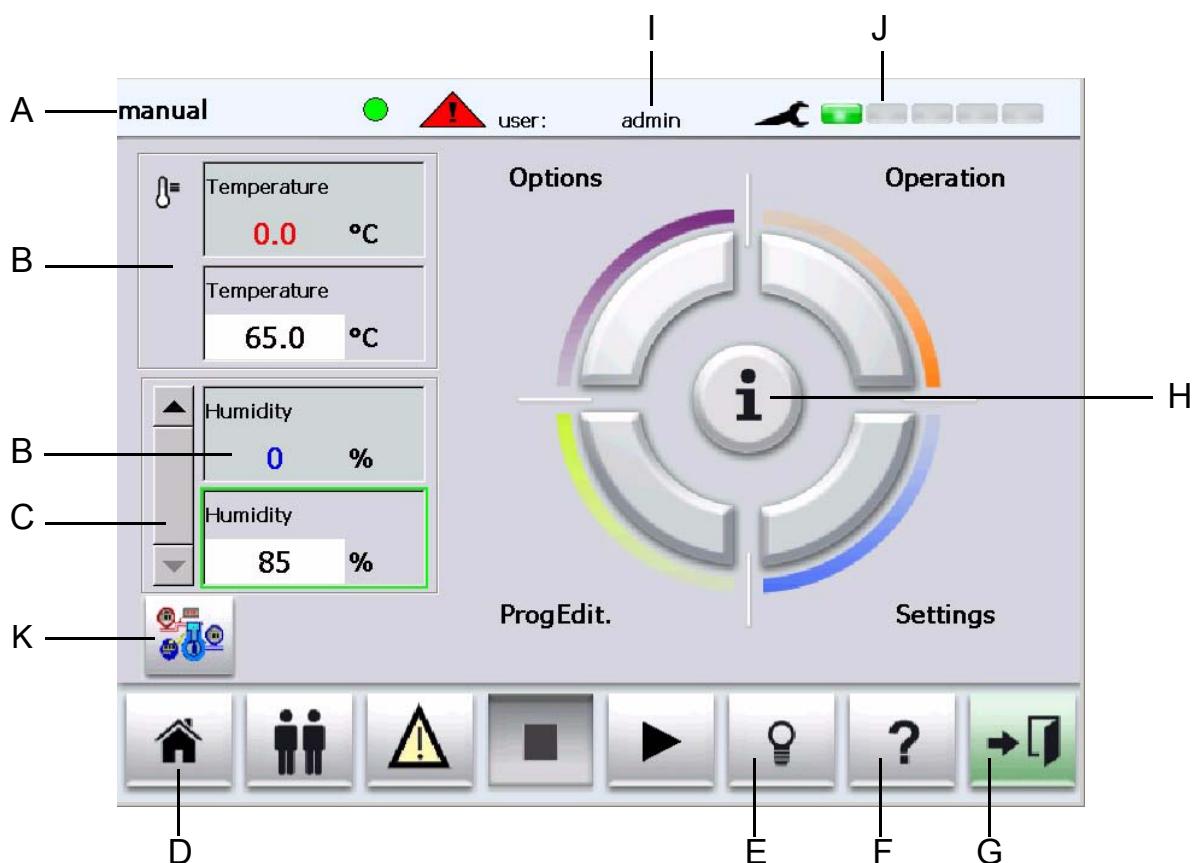


Fig. 2-1
Basic menu

- A Operating status of the device
manual mode or program mode
- B Display of the actual and nominal values of the control variables
above: actual value, below: nominal value
- C other control variable displays
- D Return to basic menu
- E Switch light in the usable space on / off → 2.5 (page 12)
- F Information about the device and the controller → 2.6 (page 13)
- G Return to the last menu
- H Trend graphics display → 2.4 (page 8)
- I logged-on user
- J Maintenance bar / display of date and time → 2.2 (page 6)
- K Calling up the System diagram¹⁾

2.2 Display maintenance bar / date and time

- refer to Chapter 2.1 , Fig. 2-1 (page 5)

If the control unit is started, then the maintenance status (maintenance bar) is displayed in the upper right-hand corner of the display via an LED chain.

- press the maintenance bar.

The maintenance menu appears → 3.2.6 (page 40)

- Press the button  to exit the menu

The date and time are displayed in the basic menu instead of the maintenance bar.



NOTE

The maintenance bar is displayed again automatically after 24 hours (0 o'clock), or if the maintenance status of a maintenance variable is greater than 60% or greater than 80%.

2.2.1 Maintenance function

The controller monitors various counters (e.g. compressor operating hours, fan operating hours, etc.) that are stored for the maintenance intervals.

The maintenance status indicates how many % of the threshold has already been reached. The status of the maintenance variable that is the farthest advanced is displayed.



Fig. 2-2
Maintenance display

The LED indicates the maintenance status in % increments. The LEDs display the ranges from 0% to 60% in green, the ranges from 60% to 80% in yellow, and those from 80% to 100% in red.



NOTE

If the maintenance status is in the range from 60% - 80% (yellow), we recommend that you arrange a maintenance appointment with our service organisation.

2.3 System diagram¹⁾

- refer to Chapter 2.1 , Fig. 2-1 (page 5)

This diagram provides you with an overview of the current statuses for system parameters, set values and control variables.

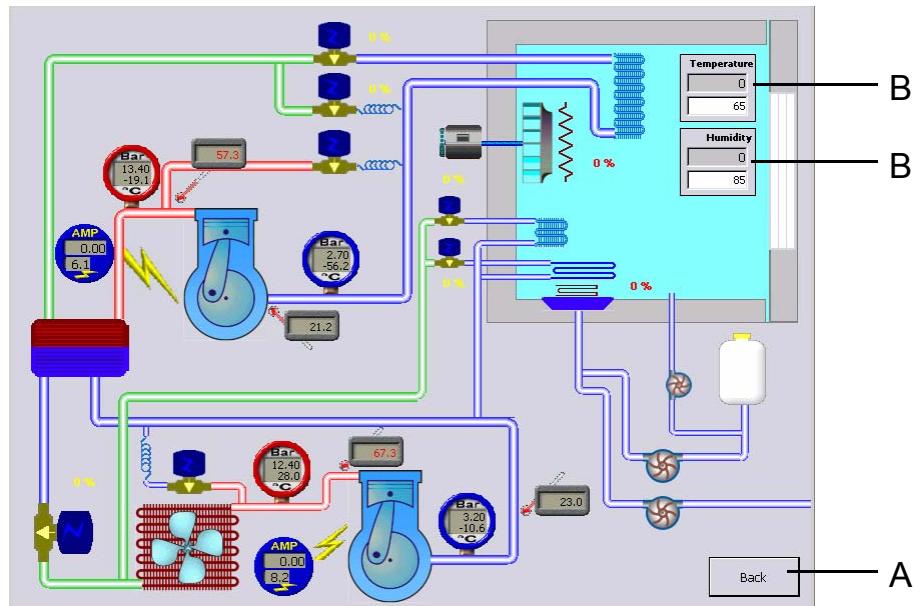


Fig. 2-3
System diagram

- A return to basic menu
- B Display of actual and nominal values of the control variables above: actual value, below: nominal value



NOTE

The nominal values for the control variables can be altered in this view → 4.2.1 (page 42).

2.4 Trend graphics

- refer to chapter 2.1 , Fig. 2-1 (page 5)

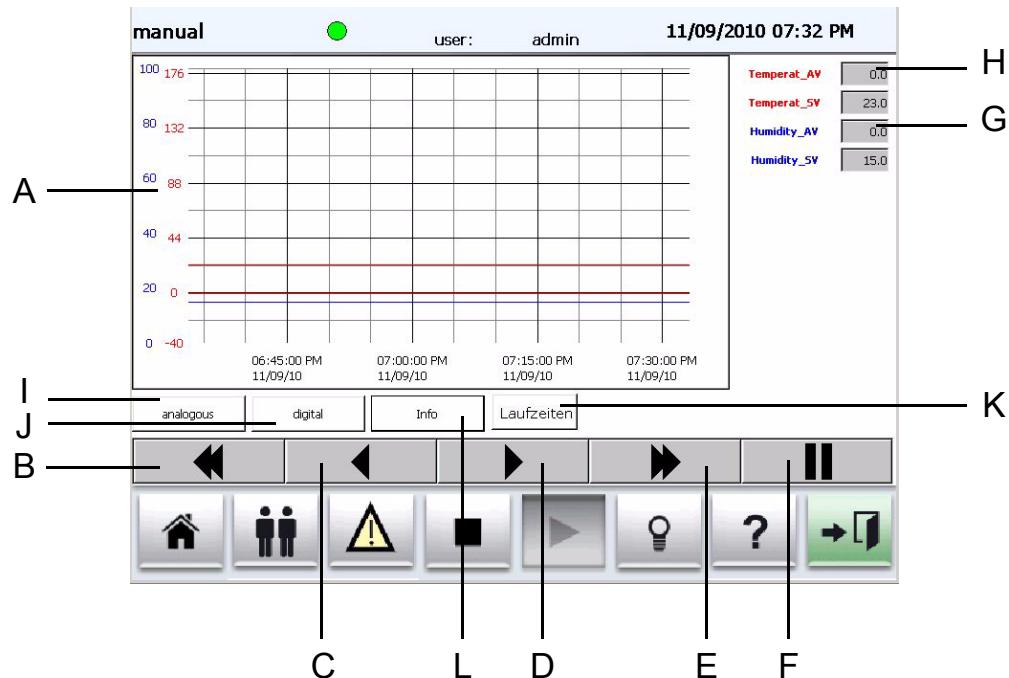


Fig. 2-4
Trend graphics

- A Nominal and actual values chart
- B Chart back multiple segments
- C Chart forward single segments
- D Chart forward single segments
- E Chart forward multiple segments
- F Have chart pause/continue
- G Actual value of the humidity control variable²⁾
- H Actual value of temperature control variable
- I Listing of the control variables with nominal and actual value and the measured values → 2.4.1 (page 9)
- J Listing of the extra functions (digital channels) with status display (active / inactive) → 2.4.2 (page 9)
- K Program information is displayed
(in the »Automatic«-mode only → Fig. 4-10 (page 50))
- L Enlarged display of the control variables with nominal and actual value → 2.4.3 (page 10)

2.4.1 Listing of the control variables with nominal and actual value and the measured values

- refer to chapter 2.4 , Fig. 2-4 (page 8)

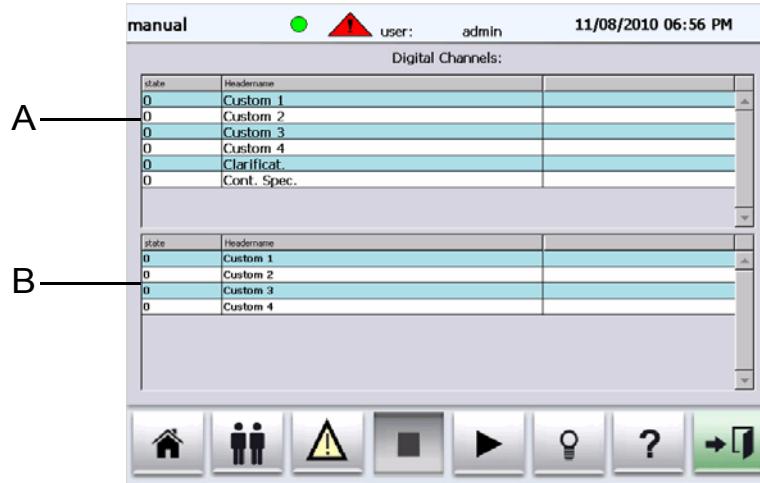


Fig. 2-5

Overview control variables

A Control variables

B Measured values

2.4.2 Listing if the extra functions (digital channels)

- refer to chapter 2.4 , Fig. 2-4 (page 8)

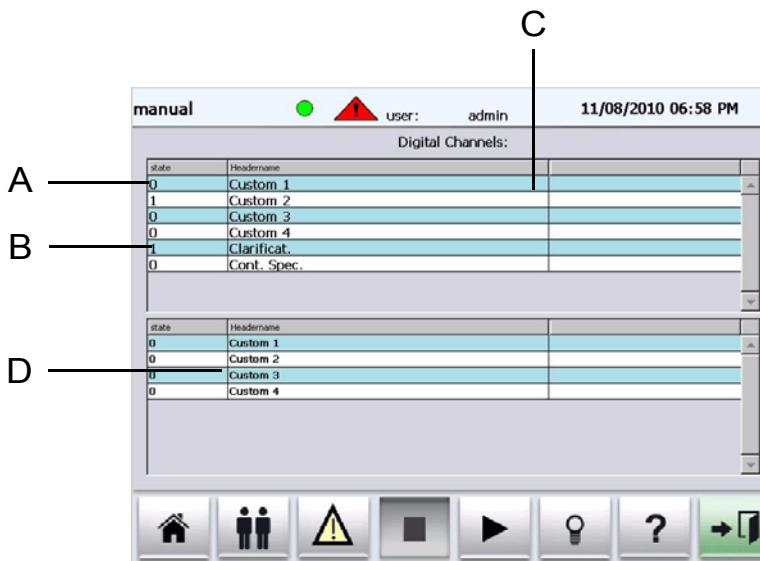


Fig. 2-6

Overview extra functions

A disabled

B active

C Extra functions

D Digital inputs

2.4.3 Enlarged display of the control variables (nominal / actual value)

- refer to chapter 2.4 , Fig. 2-4 (page 8)

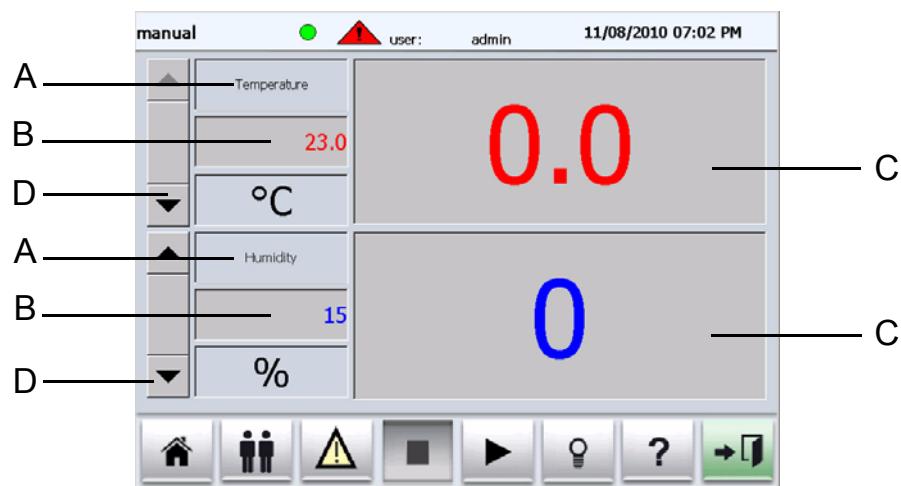


Fig. 2-7
Display control variables

- A Control variable
 - B Nominal value
 - C Actual value
 - D display additional control variables
- Press the or button to display other control variables.

2.4.4 Trend graphics settings

- refer to chapter 2.4 , Fig. 2-4 (page 8)
- to revise the settings for the scales and the time axis, press in the mid-section of the chart.

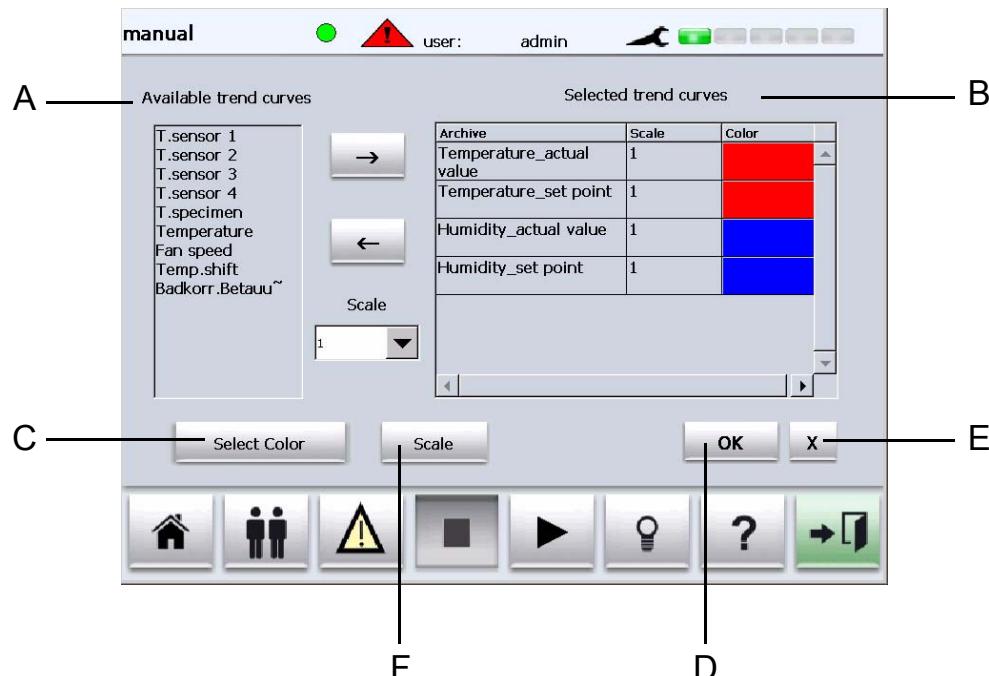


Fig. 2-8
Trend graphics settings

- A Measured variables available
- B Measured variables selected
- C Measured variables colour selection
- D Save settings
- E Exit menu without saving
- F Setting the time axes (scales) → 2.4.5 (page 12)

Up to ten measured variables can be displayed in the trend chart. By selecting the measured variable it can be shifted to the right using the button or to the left using the button.

NOTE

To assign a colour or a scale to a measured variable, the measured variable must be selected beforehand.



2.4.5 Time axes settings

- refer to chapter 2.4.4 , Fig. 2-8 (page 11)

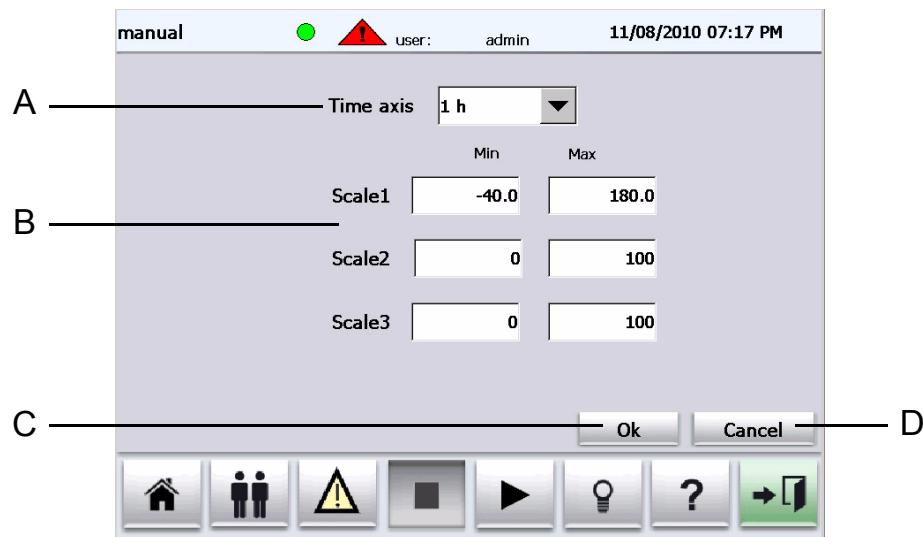


Fig. 2-9
Time axis settings

- A Set time axis
- B Set scale values
- C Save values
- D Exit menu without saving



NOTE

Using the time axis can be set to a range from 1 minute to 48 hours.

2.5 Light in the usable space¹⁾

- refer to chapter 2.1 , Fig. 2-1 (page 5)

With , you can switch the light in the usable space on and off.

When the light is switched on, the display changes .

The time after which the light is automatically switched off again can be set in the configuration menu → 3.2.2 Configuration (page 19).

2.6 Device information

- refer to chapter 2.1, Fig. 2-1 (page 5)

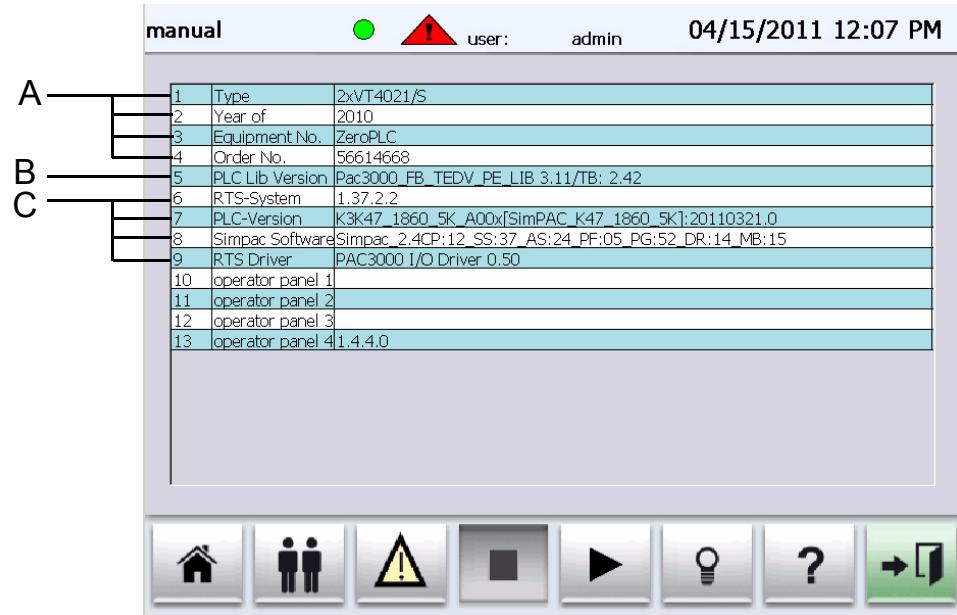
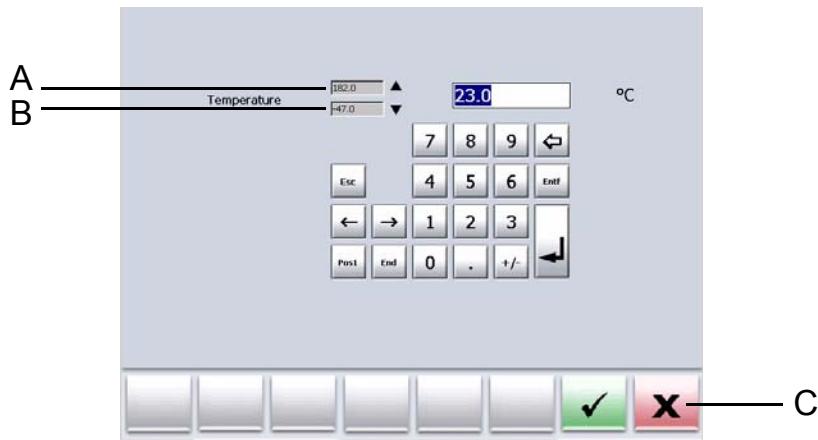


Fig. 2-10
Device information

- A Device information:
Year of manufacture
Unit number
Order number
- B Software version
- C Information about the software

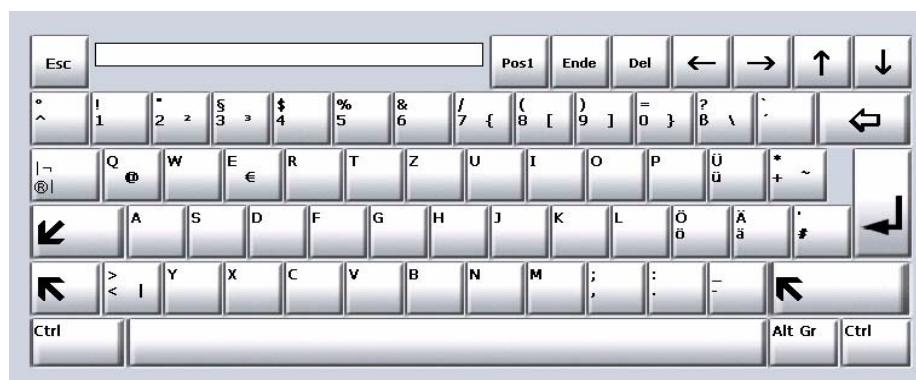
2.7 Input menu

There are two input menus for entering text and numbers. These appear immediately once a changeable field is pressed. An entry is confirmed by pressing 



*Fig. 2-11
Entry of numbers*

- A maximum value that can be set
- B minimum value that can be set
- C Exit input field without saving



*Fig. 2-12
Entry of text*

2.8 Log user on

All functions are arranged in user levels. As a result, you have the option of permitting several users access to various user levels. Every user group is assigned a password.



NOTE

*User administration and password protection is deactivated in the as-delivered state.
You are now logged on as »admin«.*

Passwords

The password has to be changed for the individual user groups.

The passwords are assigned as follows upon delivery:

»Administrator« user group

- User name: admin
- Password: admin

»Main user« user group

- User name: userhigh
- Password: userhigh

»User with limited rights« user group

- User name: userlow
- Password: userlow

- press the button and re-log on as administrator → Fig. 2-1 (page 5).

The following message appears:

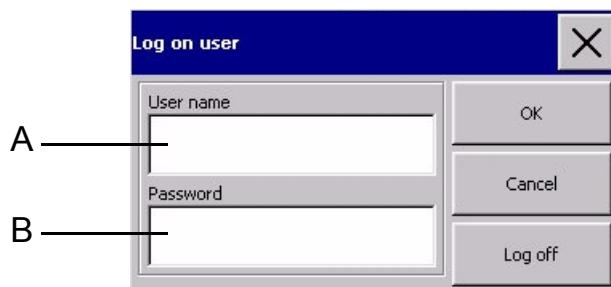


Fig. 2-13
Log user on

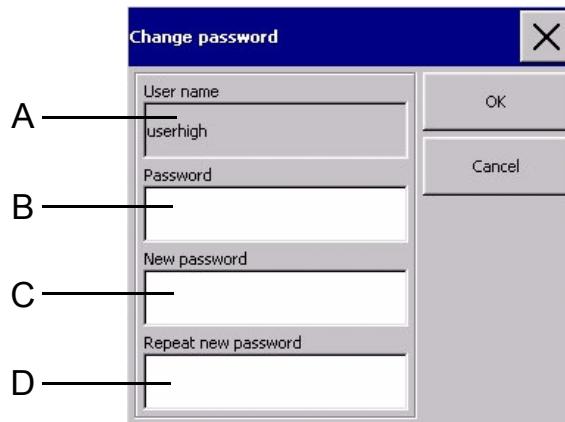
- A User name
- B Password
- enter the user name »admin«.
- enter the password »admin«.
- press the »OK« button.

The message appears stating that the password has to be changed.



- confirm the message with »OK«.

The following message appears, in which the new password is assigned:



*Fig. 2-14
Change password*

- A User name whose password is changed
- B Previous password
- C New password
- D Repeat new password

- enter the previous password for the administrator (»admin«).
- enter the new password in field »C« and »D«.

NOTE

The password must have at least 4 characters.

- press the »OK« button.

The following message appears »Log on user« → Fig. 2-13 (page 15)

- press the »OK« button

You are now logged on as administrator.

- now change the password for both the »userhigh« and »userlow« user.

NOTE

Make sure you remember the users' passwords. Only the service organisation can reset the password.

3 BASIC MENU

3.1 Overview

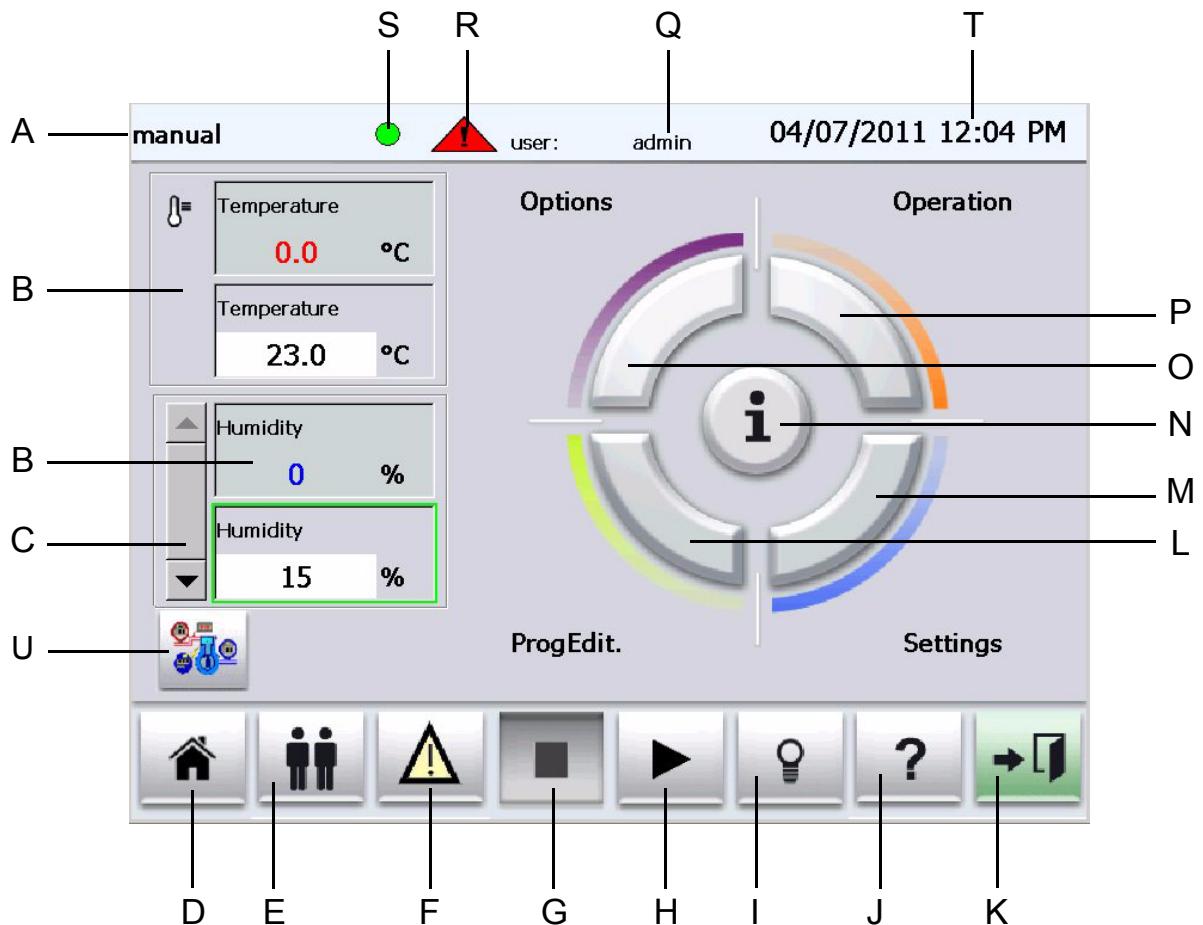


Fig. 3-1
Basic menu

- A Operating status of the device
manual mode or program mode
- B Display of the actual and nominal values of the control variables
above: actual value, below: nominal value
- C other control variable displays
- D return to basic menu
- E User administration → 3.2.2.4 (page 23)
- F Error messages call-up → Fig. 6-1 (page 65)
- G Stop test/program → 4.2.5 (page 43), → 4.4.3 (page 52)
- H Start/interrupt test/program → 4.2.4 (page 43), → 4.4.2 (page 52)
- I Switch light in the usable space on / off → 2.5 (page 12)
- J Information about the device and the controller → 2.6 (page 13)
- K Return to the last menu
- L Program editor call-up → 5 (page 55)

- M Additional settings (language, limit values, parameters, configuration) → 3.2 (page 18)
- N Trend graphics display → 2.4 (page 8)
- O Call-up of options, customer channels, set values, measurement values and counters → 4.3 (page 44)
- P Operating menu call-up → 4 (page 41)
- Q logged-on user
- R existing messages/error messages
- S Communication status display
Display of the link to the controller
green: link exists
red: no link
- T Maintenance bar / display of date and time → 2.2 (page 6)
- U Calling up the System diagram¹⁾ → 2.3 (page 7)

3.2 Settings

- refer to chapter 3.1 , Fig. 3-1 (page 17)

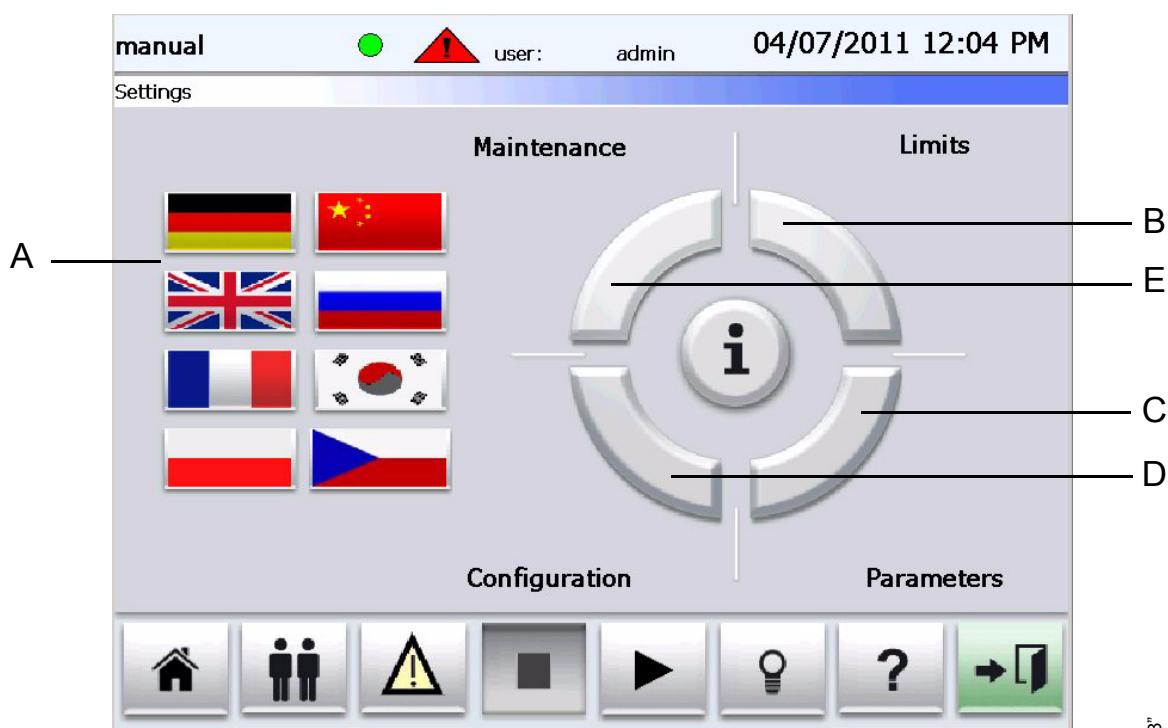


Fig. 3-2
Menu for settings

- A Select language → 3.2.1 (page 19)
- B Call-up of the menu for limit values → 3.2.5 (page 39)
- C Call-up of the menu for parameters → for service organisation only
- D Call-up of the menu for configuration → 3.2.2 (page 19)
- E Maintenance → 3.2.6 (page 40)

3.2.1 Set language

- refer to chapter 3.2, Fig. 3-2 (page 18)

The user interface can be displayed in various languages.

- select the appropriate language.

The interface immediately changes to the desired language.

3.2.2 Configuration

- refer to chapter 3.2 , Fig. 3-2 (page 18)

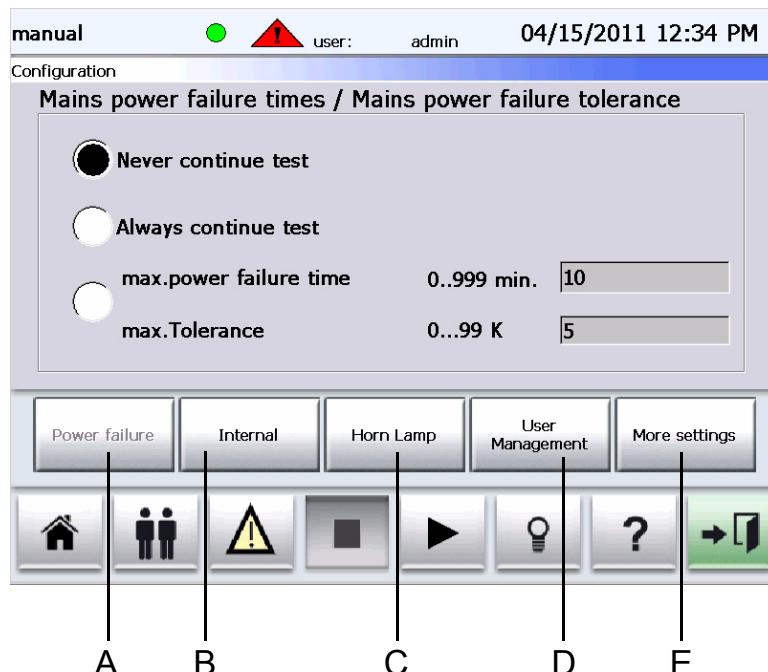


Fig. 3-3
Configuration

- A Power failure parameters → 3.2.2.1 (page 20)
- B External communication with controller → 3.2.2.2 (page 21)
- C Set usable space lighting / alarm horn → 3.2.2.3 (page 22)
- D User administration → 3.2.2 (page 19)
- E additional settings → 3.2.3 (page 28)

3.2.2.1 Set power failure time / power failure tolerance

- refer to chapter 3.2.2 , Fig. 3-3 (page 19)

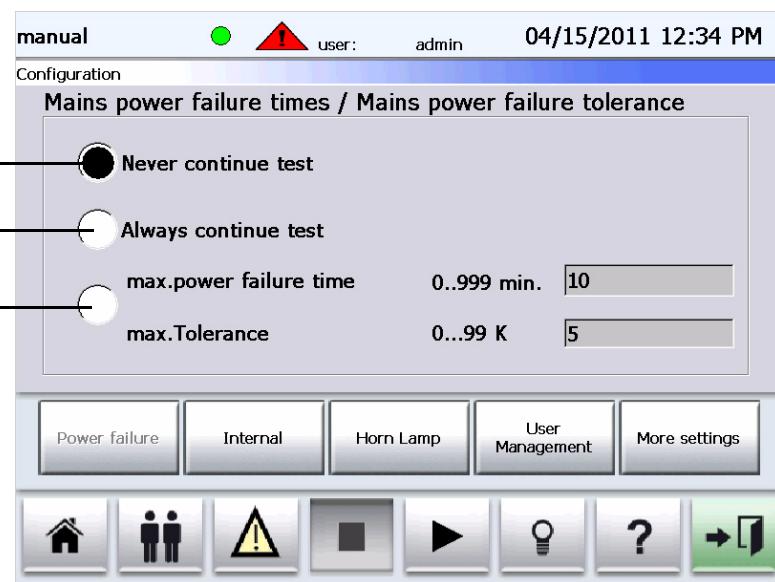


Fig. 3-4
Power failure time/power failure tolerance

- A Test is never resumed
- B Test is always resumed
- C Power failure time / power failure tolerance

If power is restored within this time after a power failure, operation is resumed at the point where it was interrupted.

The power failure tolerance is the maximum amount by which the actual value may deviate from its nominal value during a power failure. The power failure tolerance value always refers to the test space temperature.

Example:

The value set is 5 K: That is to say, once power has been restored, if the temperature deviates by less than 5 K from the nominal value set and if the power failure time is within the permitted range, operation will be continued using the settings in place prior to the mains failure.

3.2.2.2 External communication with controller

- refer to chapter 3.2.2 , Fig. 3-3 (page 19)

To switch over to external mode, select the  Internal button.

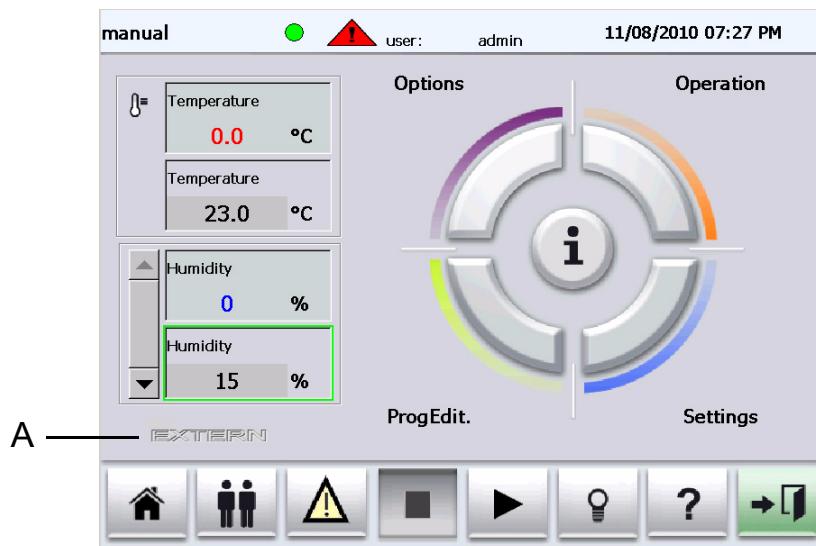
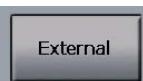


Fig. 3-5
Basic menu in external mode

A Device is in external mode

In external mode, external control systems (e.g., SIMPATI* software) can communicate with the controller. Operation is locked by the control panel.

Symbol	Function
	activated Status display: manual or program name Manual and program mode, start and stop possible via the control panel
	activated »External« display in the basic menu Test programs or tests cannot be started or stopped via the control unit

3.2.2.3 Set usable space lighting / alarm horn¹⁾

- refer to chapter 3.2.2 , Fig. 3-3 (page 19)

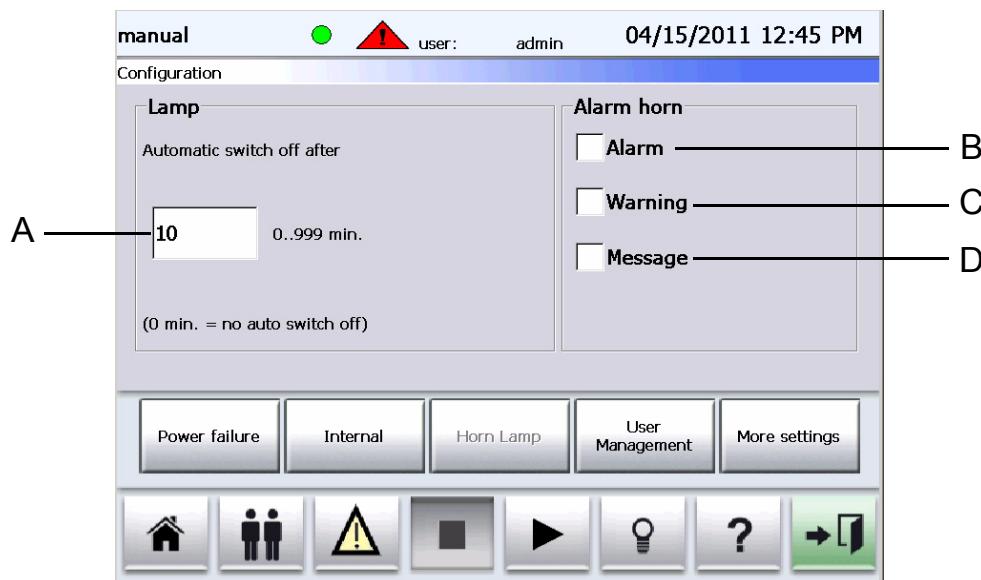


Fig. 3-6
Usable space lighting

- A Time set for switching the lighting off automatically
- B Alarm horn activated for alarms
- C Alarm horn activated for warnings
- D Alarm horn activated for messages

Usable space lighting¹⁾

Here you can set the time at which the usable space lighting, when switched on, switches itself off again automatically. If 0 min are set, there is no automatic switch-off.

Alarm signal-horn¹⁾

If the device is equipped with an acoustic alert, then when the audio signal should sound can be set here.

3.2.2.4 User administration

- refer to chapter 3.2.2 , Fig. 3-3 (page 19)



NOTE

*User administration and password protection is deactivated in the as-delivered state.
You are now logged on as »admin«.*

Only the administrator has access to the user administration. All functions are distributed among three user levels. As a result, you have the option of permitting several users access to various user levels. Every user group is assigned a password by default. Passwords can only be changed by the administrator or the respective user.

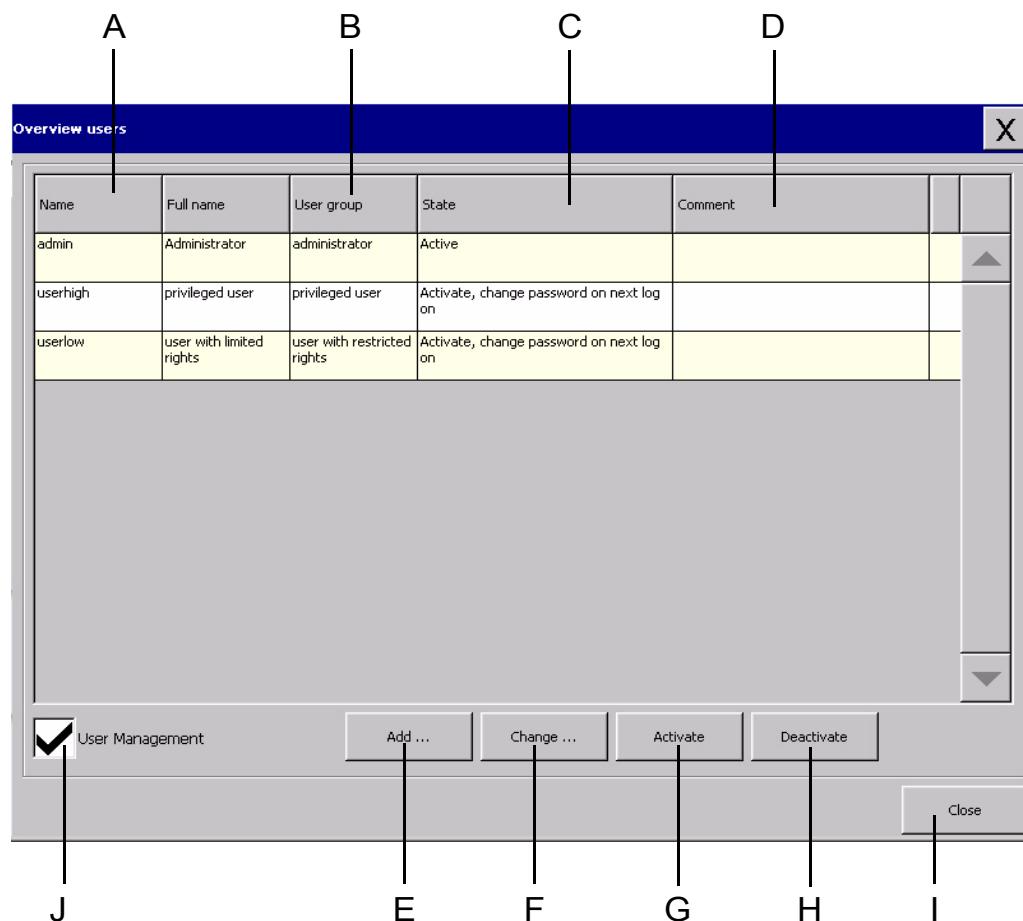


Fig. 3-7
User administration

- A User name
- B User group
- C User status → 3.2.2.7 (page 24)
- D Comment
- E Add user → 3.2.2.8 (page 25)
- F Change user settings → 3.2.2.9 (page 26)
- G Activate user
- H Deactivate user (access denied)
- I Close user administration
- J Activate user administration

3.2.2.5 Activate user administration

User administration is only active when the field is selected.

When the device is rebooted you are not automatically logged on as »admin«. If no user is logged on, »LOGOFF« appears as the user. All functions are disabled.

3.2.2.6 Organisation of the user groups

user group »User with limited rights« (»userlow«)

The following functions can be performed by the »User with limited rights«:

- Start test
- Stop test
- Start the program
- Stopping program

user group »Privileged user« (»userhigh«)

The following functions can be performed by the »Privileged user«:

- Start test
- Stop test
- Start the program
- Stopping program
- Create/edit programs
- Acknowledge error messages
- Specify nominal values for control variables
- Change language of the user interface

user group »Administrator« (»admin«)

The »Administrator« has the same rights as the »Privileged user« and he can in addition:

- Set limits
- Set external communication with controller
- Generate user administration
- Configure interfaces
- Set date and time
- Calibrate touch
- End user interface

3.2.2.7 User status

»Active«	the user is permitted access
»Deactivated«	the user is denied access, i.e., he cannot log himself on
»Activated, change password on next logon«	the user is permitted access but must enter a new password when he next logs on

3.2.2.8 Add user

Additional users can be created for the individual user groups.

- press the  button in user administration → Fig. 3-7 (page 23).

The following input field appears:

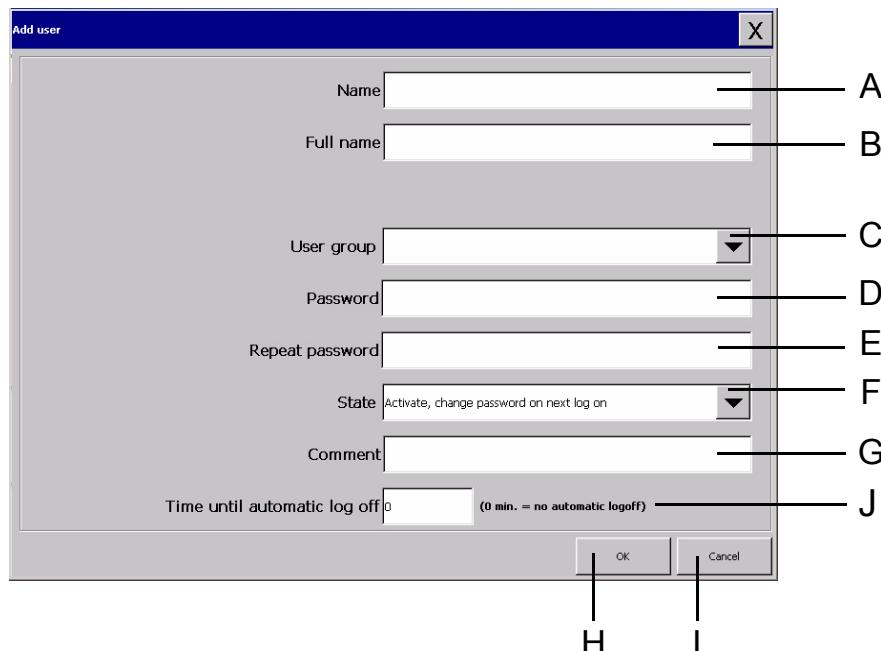


Fig. 3-8
Add user

- A User name (e.g., Smith)
- B Full user name (e.g., Michael Smith)
- C Select user group → 3.2.2.6 (page 24)
- D User password (e.g., 4711)
- E Repeat user password (e.g., 4711)
- F Select user status → 3.2.2.7 (page 24)
- G Comment about the user
- H Transfer entries
- I Exit input field
- J Time to automatic logout → page 25

Automatic logout

This is where you can set the time after which the user is logged out automatically. If »0« is set, there is no automatic logout.

NOTE

The password must contain at least 4 characters.



NOTE

Make sure you remember the users' passwords. Only the service organisation can reset the password.



3.2.2.9 Change users

The settings for the individual users can be changes (e.g., switch the user group, change password).

- select the users to be changed in user administration.
- press the  button → Fig. 3-7 (page 23).

The following input field appears:

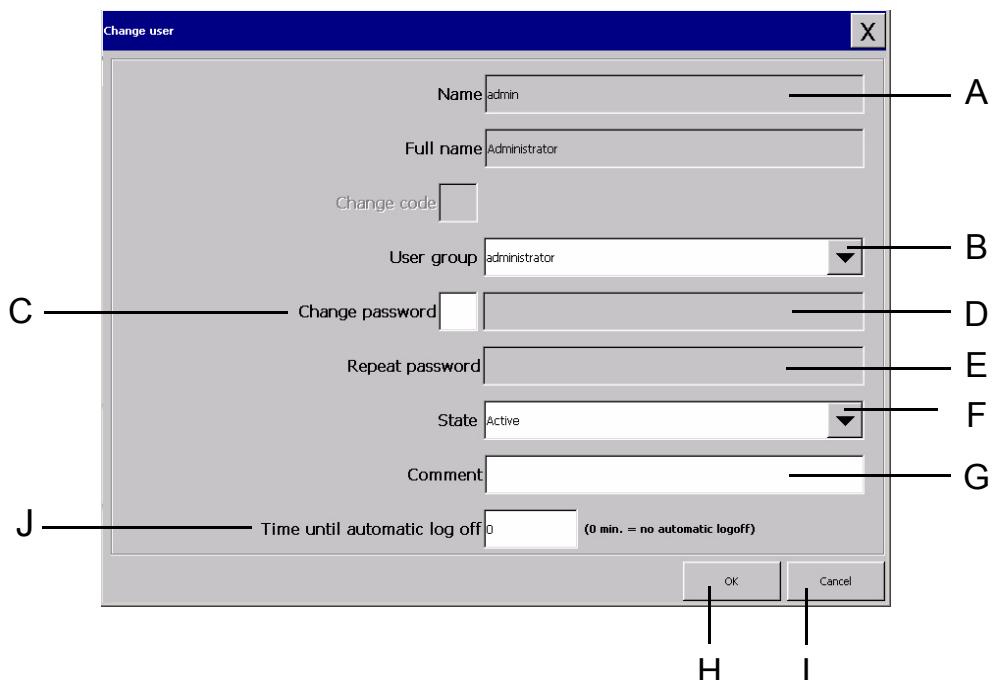


Fig. 3-9
Change user settings

- A User whose settings are changed
- B User group → 3.2.2.6 (page 24)
- C Change password
- D Enter new password
- E Repeat new password
- F Status
- G Comment about the user
- H Transfer entries
- I Exit input field
- J Time to automatic logout → page 25



NOTE

If the user's password is changed, select field »C«. The password must have at least 4 characters.



NOTE

Make sure you remember the users' passwords. Only the service organisation can reset the password.

Block access right

After you have completed operations, you should block your access right again to prevent access to unauthorised persons.

- press the  button → Fig. 3-1 (page 17).

The following message appears:

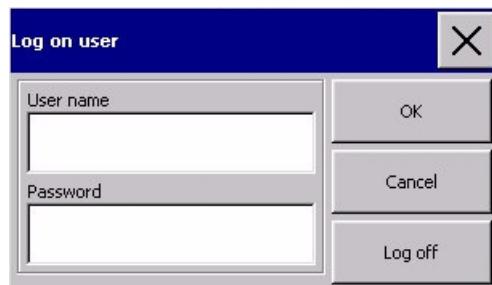


Fig. 3-10
Log user on/off

- press the  button.



NOTE

The user is now: »LOGOFF« → Fig. 2-1 (page 5) , Pos. I.

3.2.3 Configuration (Level 2)

- refer to chapter 3.2.2 , Fig. 3-3 (page 19)

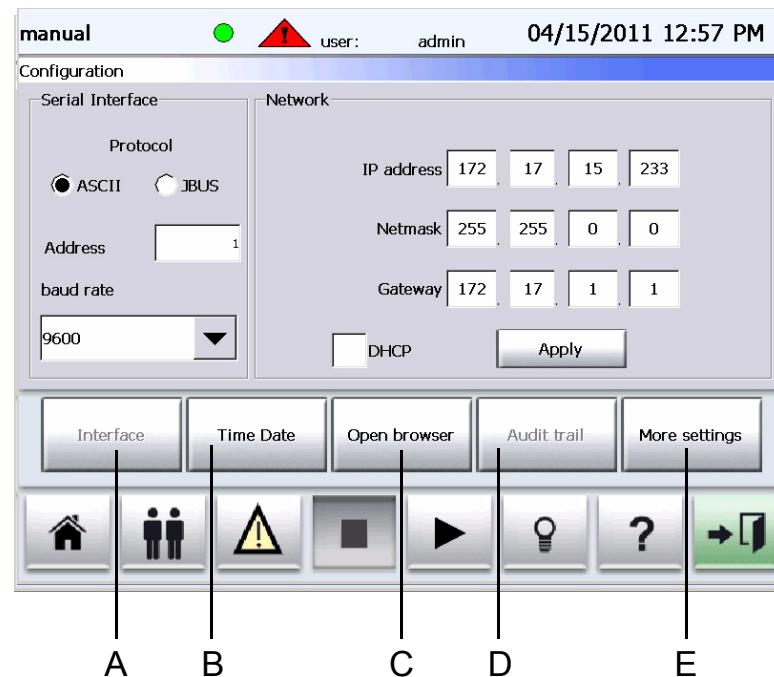


Fig. 3-11
Configuration Level 2

- A Interface configuration → 3.2.3.1 (page 29)
- B Set the date and time → 3.2.3.2 (page 31)
- C Open browser → 3.2.3.3 (page 32)
- D Record of changes (not yet available)
- E additional settings → 3.2.4 (page 33)

3.2.3.1 Configure interfaces

- refer to chapter 3.2.3, Fig. 3-11 (page 28)

This chapter relates exclusively to external communication with the device's controller.



NOTE

If linking is carried out in the LAN, it must be assured that no conflicts arise with other network users when using the communication channels and addresses (e.g., double connections). We strongly recommend that you have your network administrator set up the networks!



WARNING

Improper configuration may impair the operation of the network.

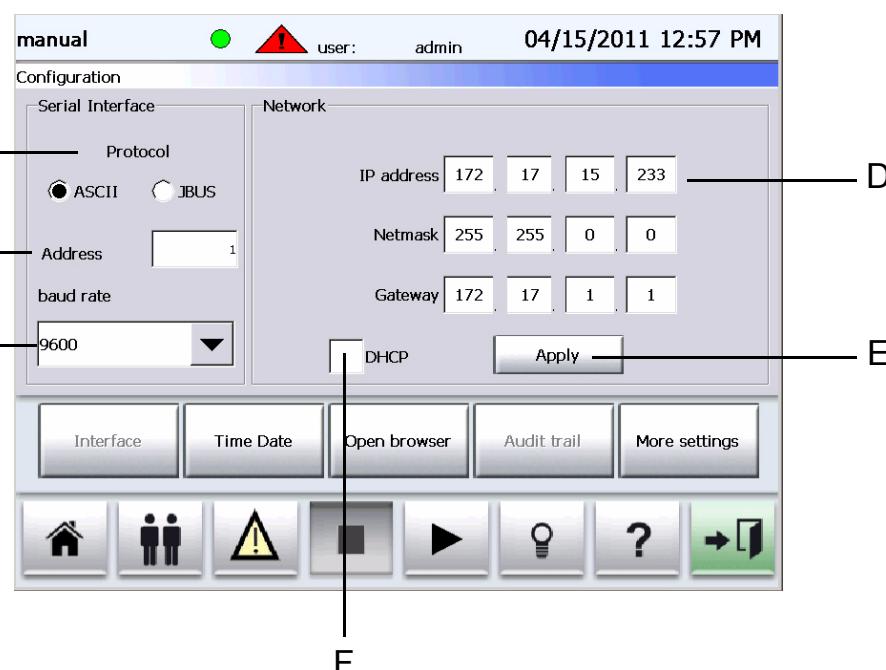


Fig. 3-12
Configuration of the interface

- Setting the interface protocol → page 30
- Set bus address
- Select baud rate
- Assign IP address → page 30
- Disclose IP address to controller → page 30
- Obtain IP address automatically



NOTE

If the device is controlled via RS 232 an IP address does not have to be assigned.

Interface protocol

- Select the interface protocol appropriate to your device.

Assign IP address

In order for the controller to be able to communicate within the network, the controller must be assigned a network-unique IP address.

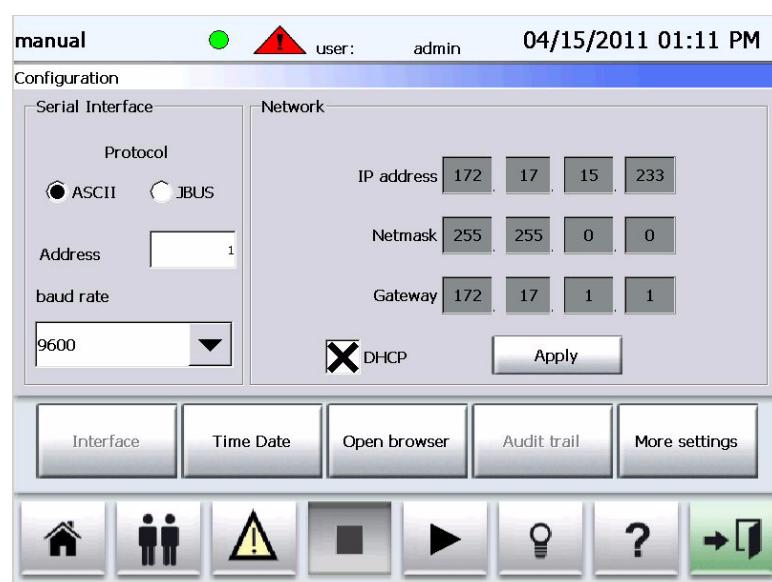
- Enter the IP address, the subnet mask and the default gateway → *Fig. 3-12 ,Pos. D.*
- disclose the IP address to controller → *Fig. 3-12 ,Pos. E.*

**NOTE**

The values must be defined by a network administrator.

or

- select »DHCP«



*Fig. 3-13
Obtain IP address automatically*

**NOTE**

*The address is assigned automatically by the external server if the network supports this
→ Consult the network administrator.*

3.2.3.2 Set date and time

- refer to chapter 3.2.3 , Fig. 3-11 (page 28)
- press the **Time Date** button.

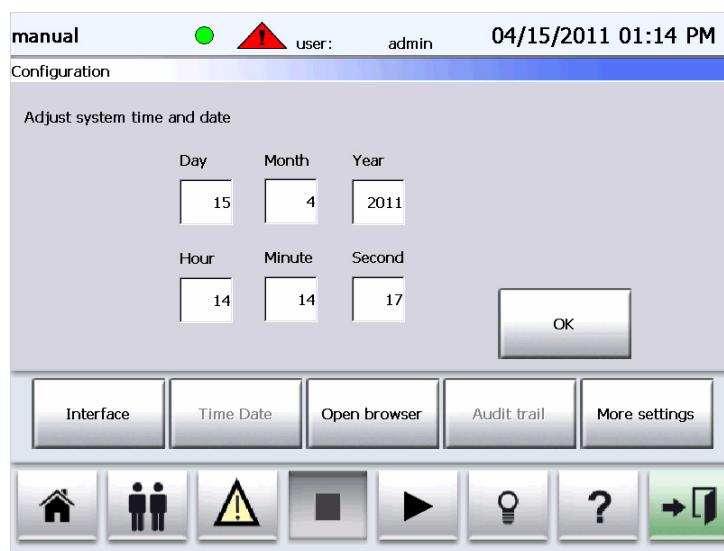


Fig. 3-14
Date and time

- make appropriate changes.
- press the »OK« button to transfer the settings.

3.2.3.3 Internet browser

- refer to chapter 3.2.3, Fig. 3-11 (page 28)
- select the language in which the Internet browser is to be opened.

The Internet browser opens the device's electronic rating plate.

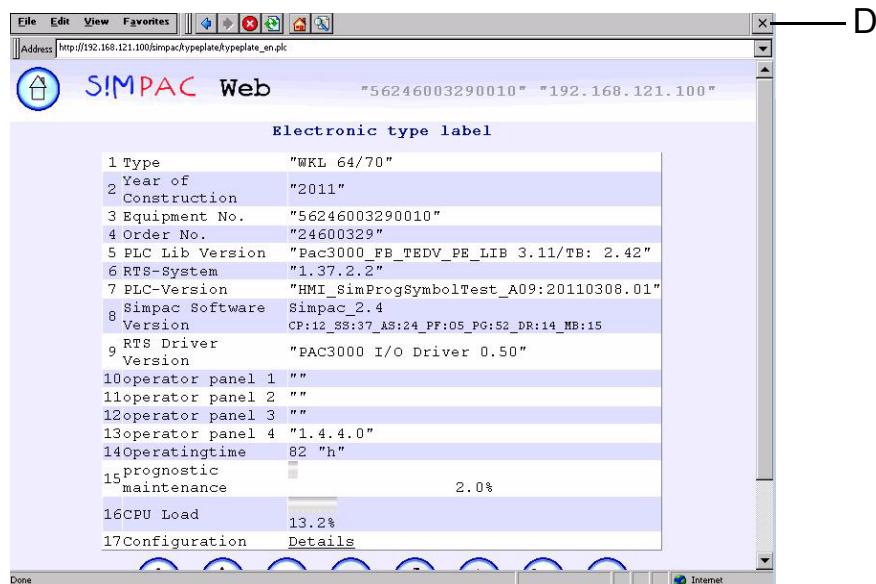


Fig. 3-15
Electronic rating plate

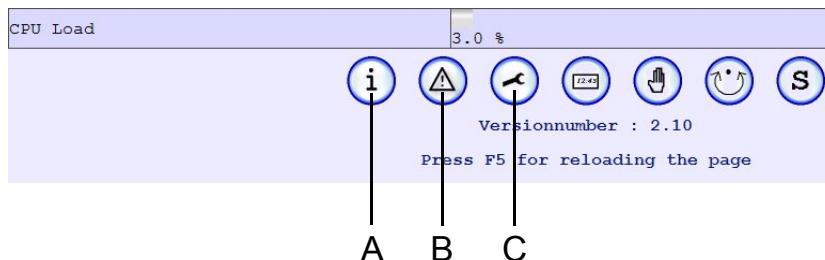


Fig. 3-16
Web menu

- A Listing of the control variables and the options (set values, measurement values, counter) activated on the device
- B Error messages call-up
- C Maintenance counter
- D Close Internet browser



NOTE

More detailed information about SIMPAC Web, refer to the manual »SIMPAC Web«.

3.2.4 Configuration (Level 3)

3.2.4.1 Software configuration

- refer to chapter 3.2.3, Fig. 3-11 (page 28)

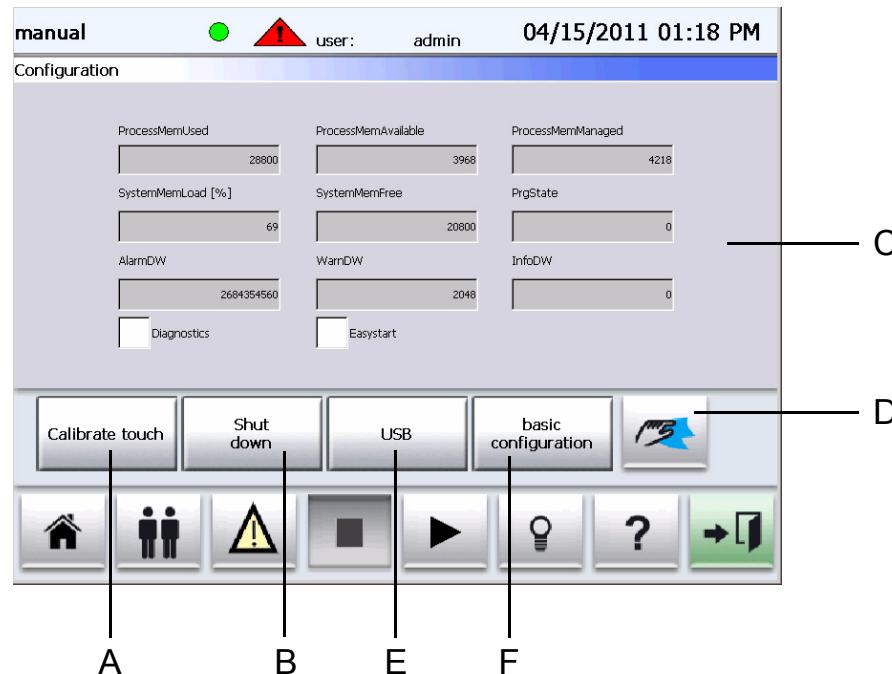


Fig. 3-17
Configuration Level 3

- A Calibrate Touch
- B End user interface → 3.2.4.2 (page 33)
- C Information about the control unit → for service organisation only
- D Clean touch display → 1.3.1 (page 4)
- E USB data recording → 3.2.4.3 (page 34)
- F Setting the basic configuration¹⁾ → 1.1.3 (page 2)

3.2.4.2 End user interface

- refer to chapter 3.2.4, Fig. 3-17 (page 33)

The user interface is ended and the Windows interface is displayed.

To restart the user interface, the device has to be switched off and on again by the master switch. The user interface boots up automatically.

3.2.4.3 USB data recording

The S!MPAC controller makes it possible to record values on a directly connected USB stick.

Preconditions:

- A TB Lib from version 2.41 up must be present (→ *Operating manual »S!MPAC Web«, Fig. 5-1 (page 5), row 5*)
- The USB stick's free memory capacity must be at least 1 megabyte
- The USB stick must be formatted with the FAT16 or FAT32 file system
- The USB stick must be formatted as a hard drive and must not be bootable (→ *Controller fault due to USB sticks (page 35)*)



CAUTION

As with all PC systems, there is the possibility of introducing or spreading malware (e.g. viruses) when USB storage media are used. Therefore use only USB sticks that have been checked for viruses.

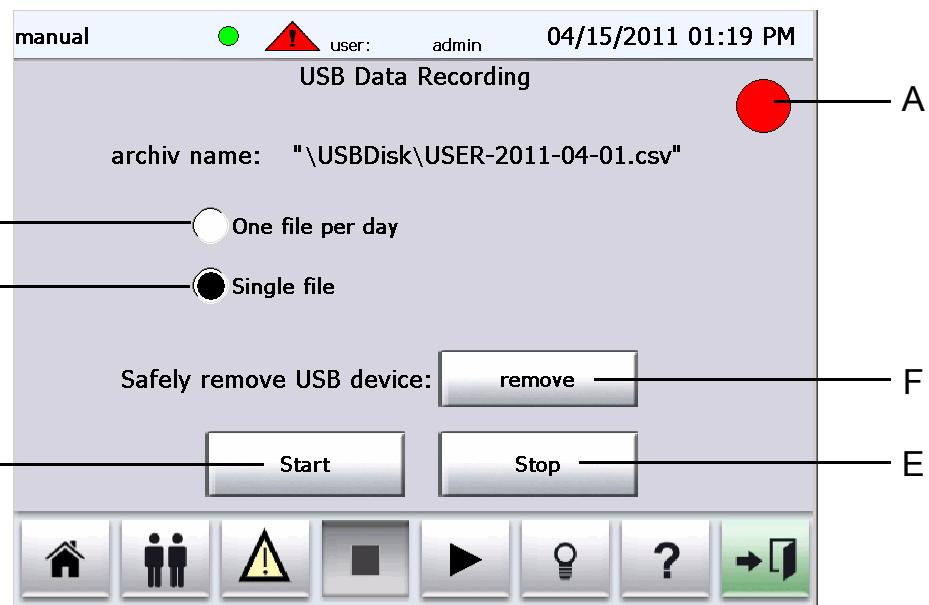


Fig. 3-18
USB data recording

- A Indicator light for data recording active (green) / inactive (red)
- B a new record file is always generated at 0 o'clock
- C the record is saved in a file in its entirety
- D Start data recording
- E Stop data recording
- F Remove USB stick securely

If the recording process has been started successfully, the indicator light illuminates green. From this point forward all configured process values will be saved 1x per minute.

**NOTE**

If the USB stick is not recognised, is not writeable or is full when the recording begins, the indicator light does not turn green. The cause is indicated via the error message list .

**NOTE**

The record files have the name »USER-YYYY-MM-DD.CSV.« In addition, as soon as a USB stick is recognised, service files with the name »SERVICE-YYYY-MM-DD.CSV« are generated automatically. These files contain system values which can be evaluated by our service organisations in the event of a fault.

Controller fault due to USB sticks

Because of their formatting, some USB sticks can prevent the booting of the controller.

**CAUTION**

Only insert the USB stick after complete booting of the controller and only remove it after pressing »remove« → Fig. 3-18.

The problem can nevertheless occur due to a power failure.

You should only use non-bootable USB sticks. If the USB stick is bootable, then it must be formatted with the »HP USB Disk Storage Format Tool«.

The tool is freeware and can be downloaded from the Internet under »HP USB Disk Storage Format Tool«. Format the USB stick as follows:

- connect the blank USB stick to the PC and start the downloaded »HP USB Disk Storage Format Tool.exe« file.

The following menu appears:



**CAUTION**

If no device is displayed under »Device«, the USB stick may not be usable. In this case do not press »Start«, else you put the PC into a non-bootable state. Remove the USB stick:

- Select »FAT32« under »File system«
- Enter any name under »Volume label«
- Deactivate »Quick Format« and »Create a DOS startup disk ..« options
- Press »Start«
- Confirm the request for confirmation by pressing »Yes«
- After formatting confirm the summary with »OK« and exit the program with »Close«

Removing USB stick securely

A "Secure Removal" function is available to prevent the file system from being damaged. Monitoring to detect whether a USB stick with sufficient memory is present is also ongoing.

**NOTE**

If less than 1 megabyte of memory is available on the USB stick, the indicator light illuminates red and the message »Not enough USB memory« appears in the error message list. The recording process is stopped.

- Press »remove« → Fig. 3-18 to remove the USB stick securely.

The following message appears »USB unit can now be removed«. This can be confirmed by pressing »OK« when you have removed the USB stick.

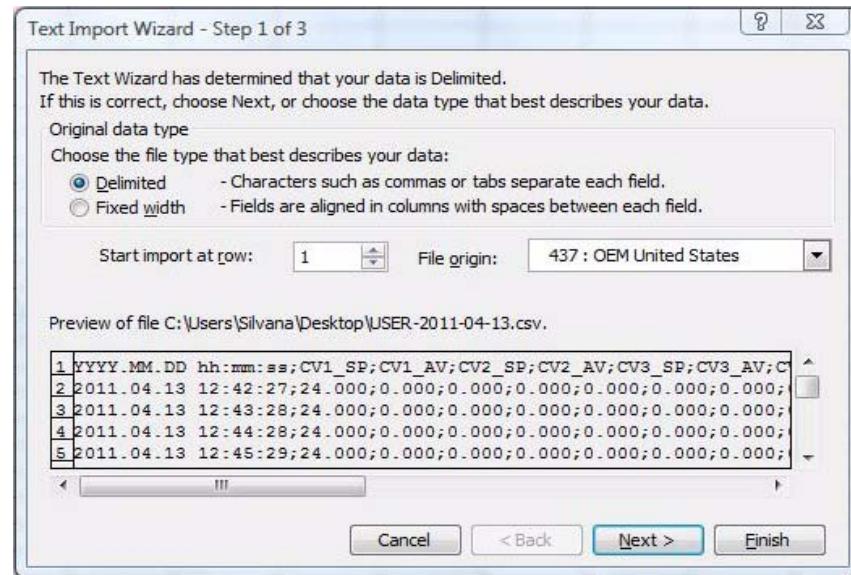
Importing USB data recording into Microsoft Excel

USB data records are saved in the so-called CSV format, i.e. the values are separated by semicolon. The point is used as decimal separator.

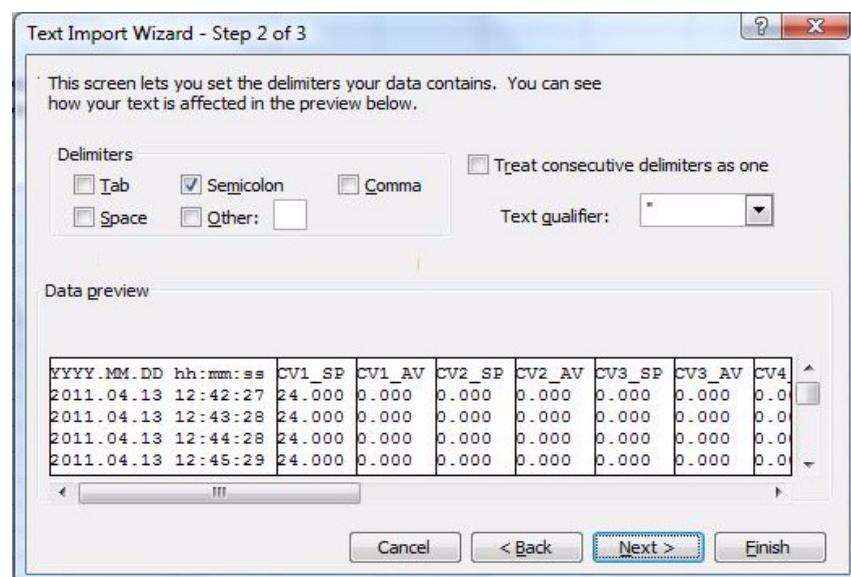
To import such a file into Microsoft Excel, select the menu item "Import data" in Microsoft Excel. The text conversion wizard opens up.

**NOTE**

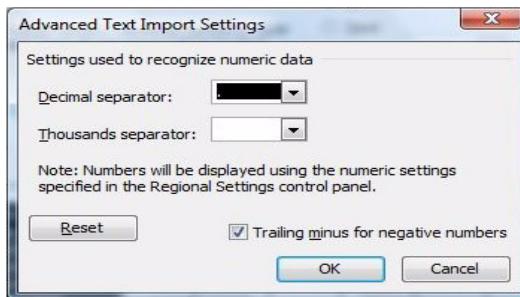
If this menu item is missing in your Microsoft Excel Installation (e.g. in Excel Starter 2010), the record file's extension must be changed to ».TXT« prior to opening.



- Press "Next" in the text conversion wizard.

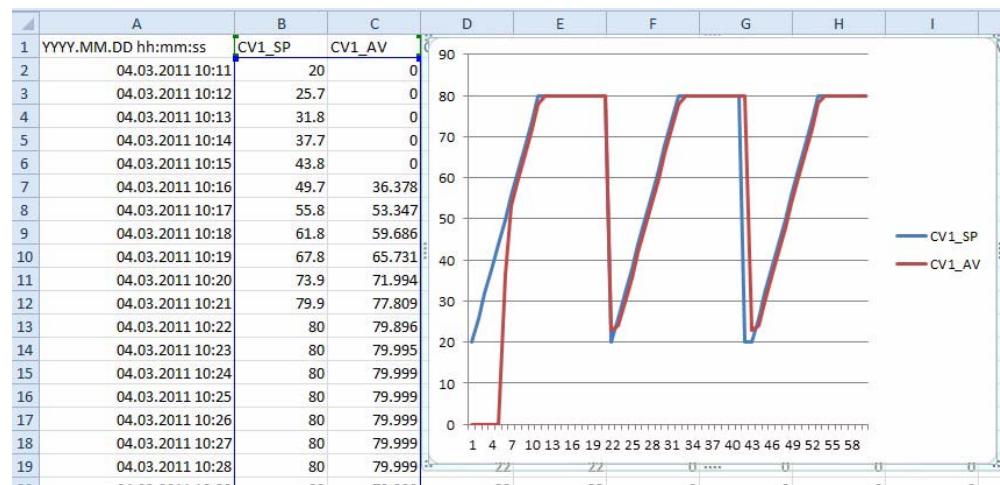


- Select semicolon as the separator.
- Press "Next" 2x.



- Select "." (point) in the menu "Other text import settings" as decimal separator and the space character as 1000 separator.
- Press "OK" and then "Finish".

The record data are now imported and can be displayed as a chart, for example, in Microsoft Excel.



3.2.5 Set limit values for control variables

- refer to chapter 3.2 , Fig. 3-2 (page 18)

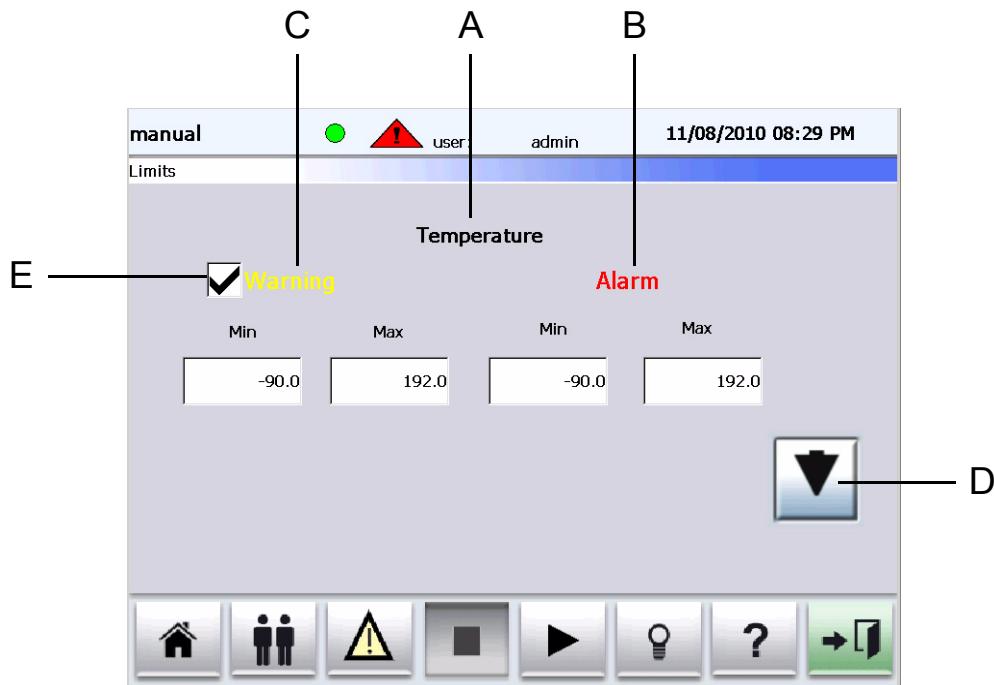


Fig. 3-19
Set limits

- A Control variables
- B Settable alarm limits
- C Settable warning limits
- D other control variable displays
- E Set active / disabled warning limits

Alarm limits

Depending on the control variable, the device switches the test off when the alarm limits are exceeded and an error message appears on the control unit. An error message appears on the control unit. However the device continues operating.

Warning limits

An error message appears on the control unit when the warning limits are exceeded.



NOTE

*Alarm and warning limits are only displayed when they are processed in the controller.
Monitoring of warning limits is activated only when checked.*

3.2.6 Maintenance function

- refer to chapter 3.2 , Fig. 3-2 (page 18)

The controller monitors various counters (e.g., compressor operating hours, fan operating hours, etc.) that are stored for the maintenance intervals.

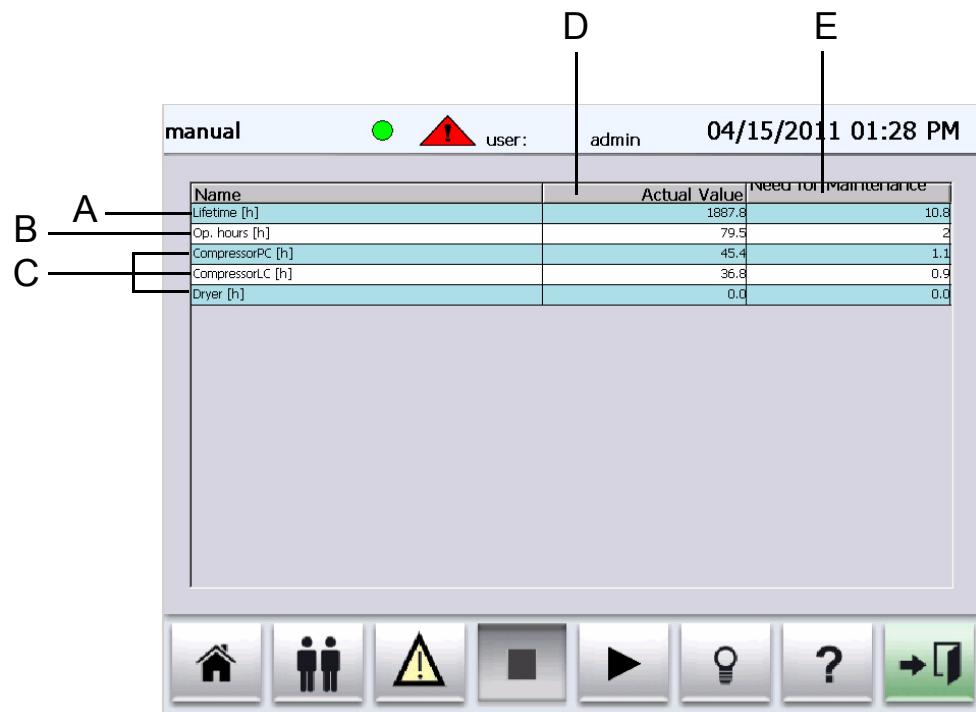


Fig. 3-20
Maintenance

- A Age of device [h]
- B Operating hours [h]
- C Maintenance variables [h]
- D Hour counter [h]
- E Maintenance requirement [%]

4 OPERATING MENU

You can call up the operating menu by pressing »Operation« in the basic menu. There are two operating modes: manual mode and program mode. In manual operation, all settings must be entered manually. In program mode, the test is specified by a previously created program.



NOTE

If a program is started in the program mode, the trend graph can be displayed by pressing the »Operation« button → 2.4 (page 8).

4.1 Overview

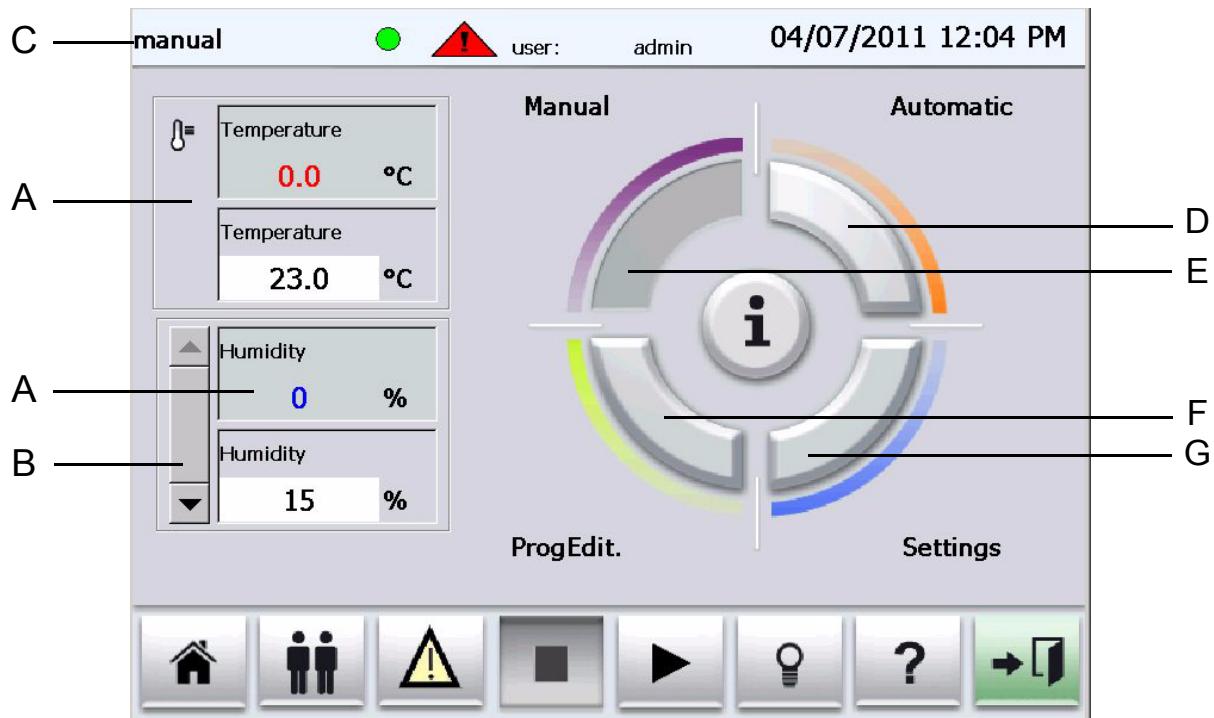


Fig. 4-1
Operating mode

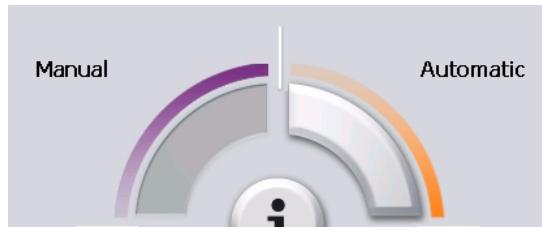
- A Display of actual and nominal values of the control variables above: actual value, below: nominal value
- B other control variable displays
- C Operating status of the device manual mode or program mode
- D Program operation → 4.4 (page 50)
- E Manual mode → 4.2 (page 42)
- F Calling up the program editor → 5 (page 55)
- G Settings → 3.2 (page 18)

4.1.1 Selecting the operating mode

The operating mode is selected using the buttons »Manual« and »Automatic« in the operating menu.

- Press the desired operating mode.

The corresponding button is shown dark. In the depiction below, manual operation is activated.



*Fig. 4-2
Selection of operating mode, here »Manual«*

4.2 Manual mode

- refer to chapter 4.1.1 , Fig. 4-2 (page 42)

Program mode is not possible in manual mode. The settings are made manually.

- Press the »Manual« button.



NOTE

*If manual mode is already active, pressing the »Manual« button is not necessary.
The operating status is displayed → Pos. C (page 41).*

4.2.1 Enter nominal value

- refer to chapter 4.1 , Fig. 4-1 (page 41)
- Press the corresponding nominal value → Pos. A .
- Enter the new value and confirm your entry with



NOTE

For temperature tests, the nominal value for humidity is to be set at 0.0%.

4.2.2 Additional control variables¹⁾

- refer to chapter 4.1 , Fig. 4-1 (page 41)

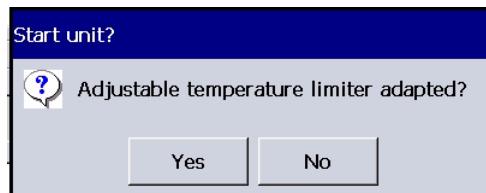
If the device is equipped with various options, more than two control variables may be available.

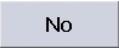
- press the button and the other control variables are shown sequentially.

4.2.3 Start test

- To start the test press 

A query asks whether the temperature limiter has been set.



- If the temperature limiter has not been set, exit the display with 
- Set the temperature limiter → *Installation and operating manual for the unit*.
- If the temperature limiter is set, press  to start the test.

The test starts with the values set for the nominal value profiles and digital channels.

4.2.4 Interrupt test

If a test is interrupted, the test time and recording are stopped.

- Press  to interrupt the test.
- To restart the test, press 

4.2.5 End test

- To end the test, press 

A query asks whether the test should be ended.

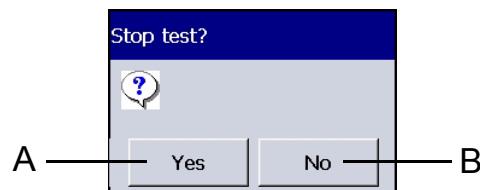


Fig. 4-3
End test

A End test

B Continue test

4.3 Options

- refer to chapter 3.1, Fig. 3-1 (page 17)



You reach the menu for Options via the button »Options«.

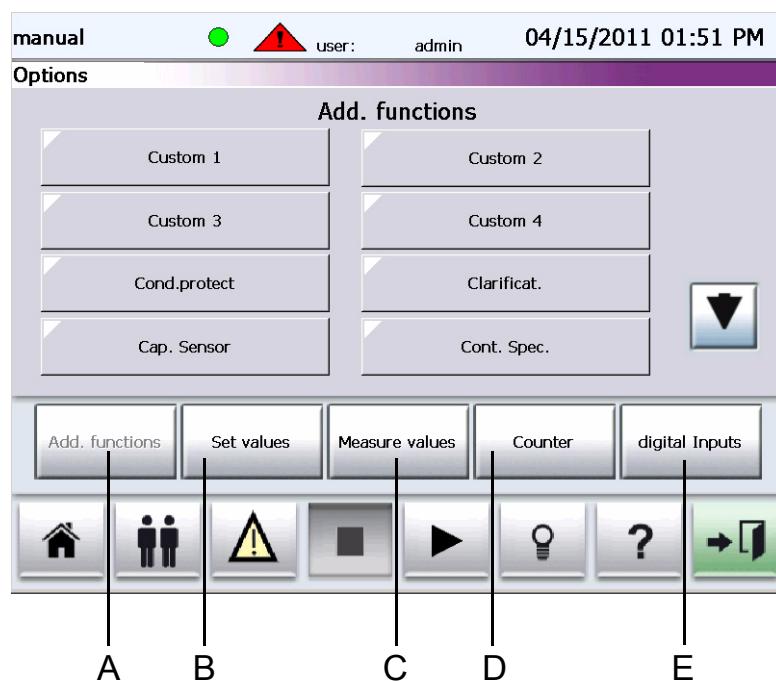


Fig. 4-4
Options

- A Additional functions → 4.3.1 (page 45)
- B Set values → 4.3.2 (page 46)
- C Measurement values → 4.3.3 (page 47)
- D Counter → 4.3.4 (page 48)
- E Digital customer inputs → 4.3.5 (page 49)



NOTE

If various options are not available for the device (e.g., no customer inputs), then the button is not displayed.

4.3.1 Activate extra functions (digital channels)

- refer to chapter 4.3 , Fig. 4-4 (page 44)

By activating the extra functions various components and operations are selected by the device's controller, which enable different tests to be conducted.

Any extra functions that may be set up (e.g. customer outputs, UV radiation or compressed air dehumidifier) can be switched on/off in this menu.



NOTE

The description of extra functions present on the device and their startup can be found in the device description.



Fig. 4-5
Extra functions

A display other extra functions

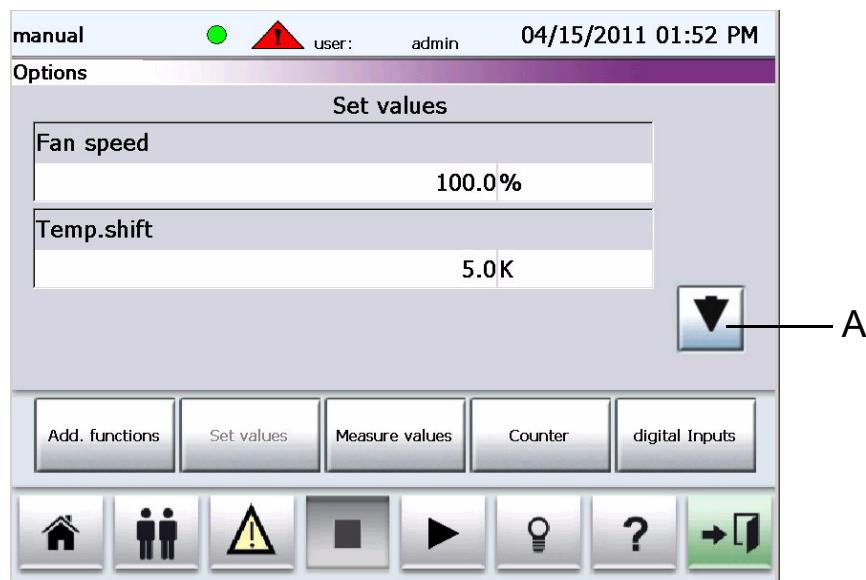
- using the or arrow select the appropriate extra function.

The extra functions can be integrated in the programs and time-control activated.
→ 5 Creating and editing programs (page 55)

4.3.2 Set values

- refer to chapter 4.3 , Fig. 4-4 (page 44)

Values are specified in the »Set values« menu, which affect how the device is controlled and therefore the tests. Control values are changeable analog quantities.



*Fig. 4-6
Entering set values*

A show other control values

- select the appropriate control value using the or arrow.
- enter the new value via the input menu.
- Confirm with

Example:

- select the fan speed currently set.

The input menu appears with the maximum and minimum value to be set.

- enter the desired speed.

4.3.3 Measurement values

- refer to chapter 4.3 , Fig. 4-4 (page 44)

Measurement values are values that are forwarded from the measured variables (e.g. sensor) to the device's controller. In the »Measure values« menu only the values are displayed; these cannot be changed. It is possible to set limits for the measurement values if they are processed by the controller.

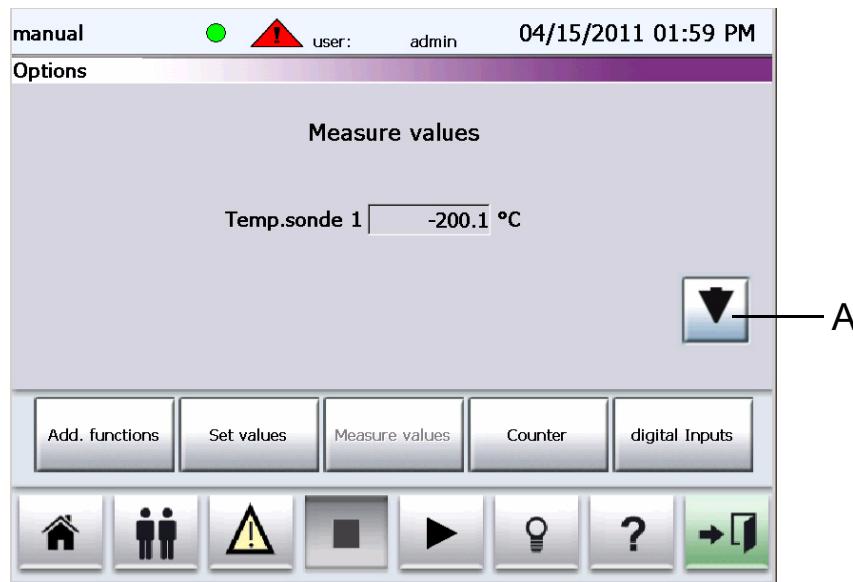


Fig. 4-7
Entering measurement values

A show other measurement values

In this menu, you can set the limits for the various measurement values.

- select the appropriate measurement value using the or arrow.
- enter the new limit via the input menu.
- Confirm with

4.3.4 Counter

- refer to chapter 4.3 , Fig. 4-4 (page 44)

A counter counts pulses up to a limit specified in this menu and deactivates the counter when reaching the limit.



*Fig. 4-8
Entering counter*

A show other counter

- select the appropriate counter using the or arrow.
- enter the new limit via the input menu.
- Confirm with

4.3.5 Display digital customer inputs

- refer to Chapter 4.3, Fig. 4-4 (page 44)

Additional equipment can be connected to the digital inputs on site. The active inputs are displayed in this menu.

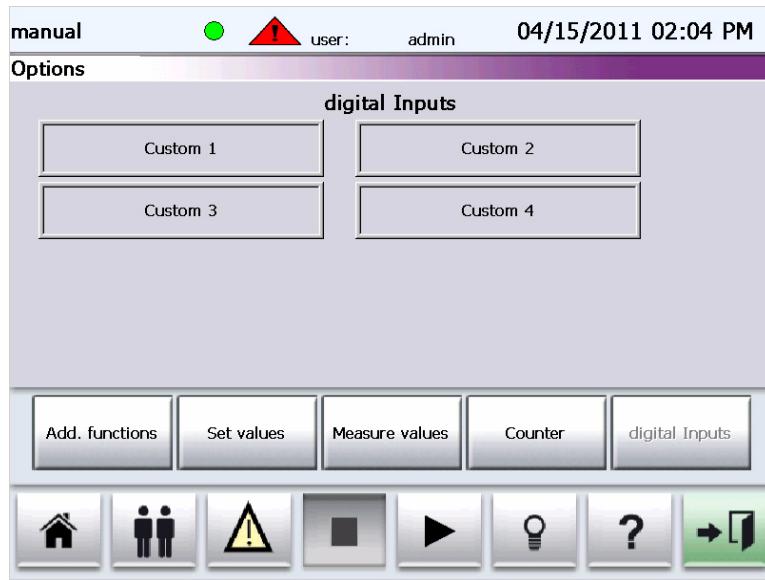


Fig. 4-9
Digital customer inputs

- activate the appropriate input via the port assigned in the master switch field.
→ *Installation and operating manual for this device*

Active inputs are displayed with a green background.



NOTE

Refer to the information about »Connections for interfaces« in the device description.

4.4 Program operation

In program operation, the test is specified by a stored program. Depending on the version of the device, programs may be saved to program locations 100 to 120.



NOTE

Programs in program locations 100 to 120 are write-protected and can be copied for processing to a program location lower than 100 → 5.1.3 (page 63).

- Press the »Automatic« → Fig. 4-1 (page 41) button to enter program operation.
- Select a program from the program list.

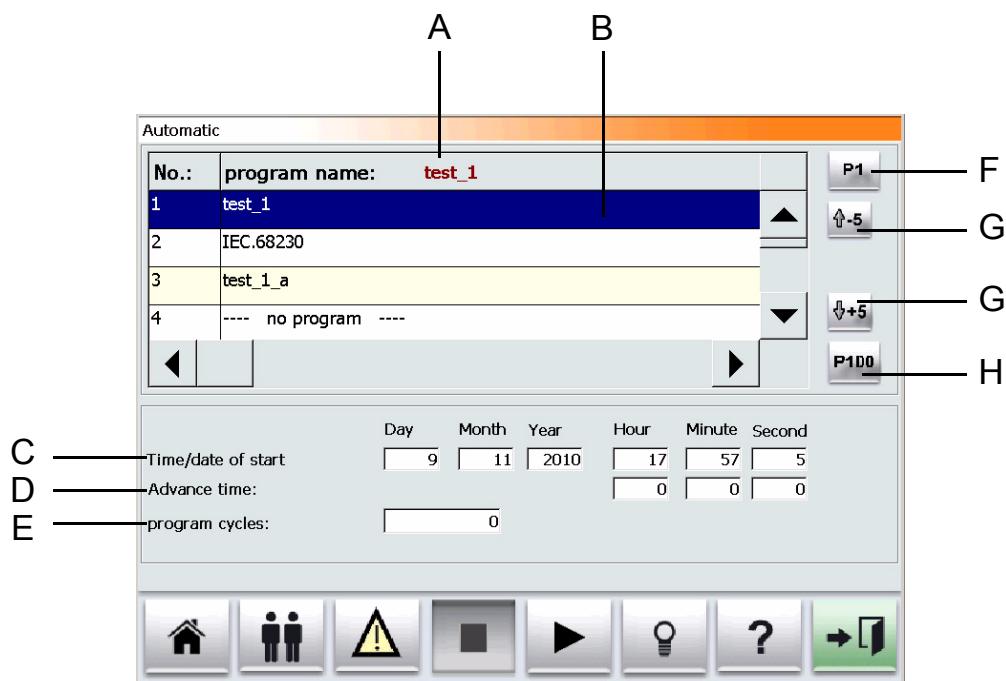


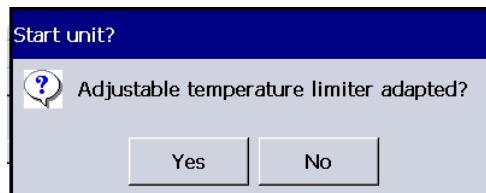
Fig. 4-10
Automatic mode

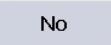
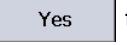
- A Program name
- B Program list → Fig. 5-1 (page 56)
- C Program start time → 4.4.4 (page 52)
- D Advanced time → 4.4.5 (page 52)
- E Program loop → 4.4.6 (page 53)
- F skip to program 1
- G Leaf through program list in increments of 5
- H skip to program 100

4.4.1 Start the program

- To start the program, press 

A query asks whether the temperature limiter has been set.



- If the temperature limiter has not been set, exit the display with 
- Set the temperature limiter → *Installation and operating manual for the unit*.
- If the temperature limiter is set, press  to start the program.

The program information appears:

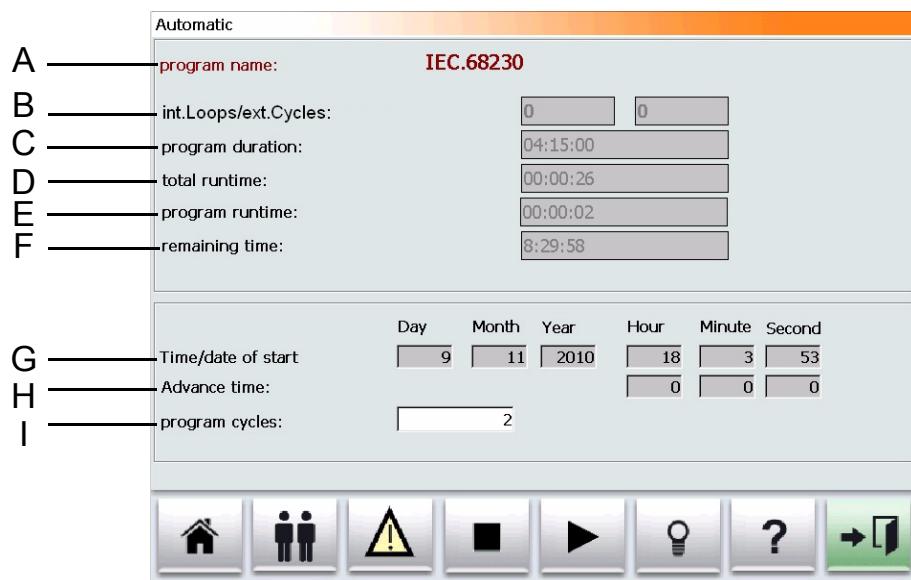


Fig. 4-11
Program information

- A Program name
- B Active program loop internal/external
- C Program duration
- D Total running time (time of the wait functions is added up as well)
- E Program running time (without wait functions)
- F Remaining operation time
- G Program start time → 4.4.4 (page 52)
- H Advanced time → 4.4.5 (page 52)
- I Number of program loops → 4.4.6 (page 53)

4.4.2 Interrupting a program

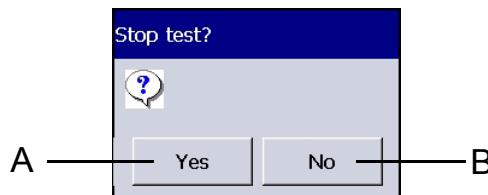
If a program is interrupted, only the program time is stopped. The controller and additional functions remain switched on.

- Press  to interrupt the program.
- To restart the program, press 

4.4.3 End program

- To end the program, press 

A query appears.



*Fig. 4-12
End program*

A End program

B Continue program

4.4.4 Program start time

- refer to Chapter 4.4, Fig. 4-10 (page 50)

This function can be used to define the time at which the program should be started.

- set the desired date and the time.

4.4.5 Pre-run time

- refer to Chapter 4.4, Fig. 4-10 (page 50)

You can use the pre-run time function to define a time / location in the program at which the program should be started.

Example:

Program duration: 2 h 45 min.

Defined pre-run time: 45 min.

The first 45 minutes of the program are skipped, and the program then starts at the defined point. The program duration is only 2 hours.

4.4.6 Program loop

- refer to chapter 4.4 , Fig. 4-10 (page 50)

The program loop function can be used to repeat the program.

- set the number of loops (cycles).

4.4.7 Active program loop internal/external

- refer to Chapter 4.4 , Fig. 4-11 (page 51)

Active program loops internal is displayed in the field, which is immediately run in the programmed loop program.

- Active program loops external is displayed in the field, which program loop (rerun) is immediately run by the overall program.

5 CREATING AND EDITING PROGRAMS

You can use the program editor to create programs (→ 5.1.2) or to edit existing programs (→ 5.1.1).

5.1 Description of the program editor

- Press the »Prog.Edit.« button.



The program list appears → Fig. 5-1 (page 56).

Templates specific to the device are stored in the system, e.g. for temperature tests or climatic tests. The corresponding channels are already set up in the template.

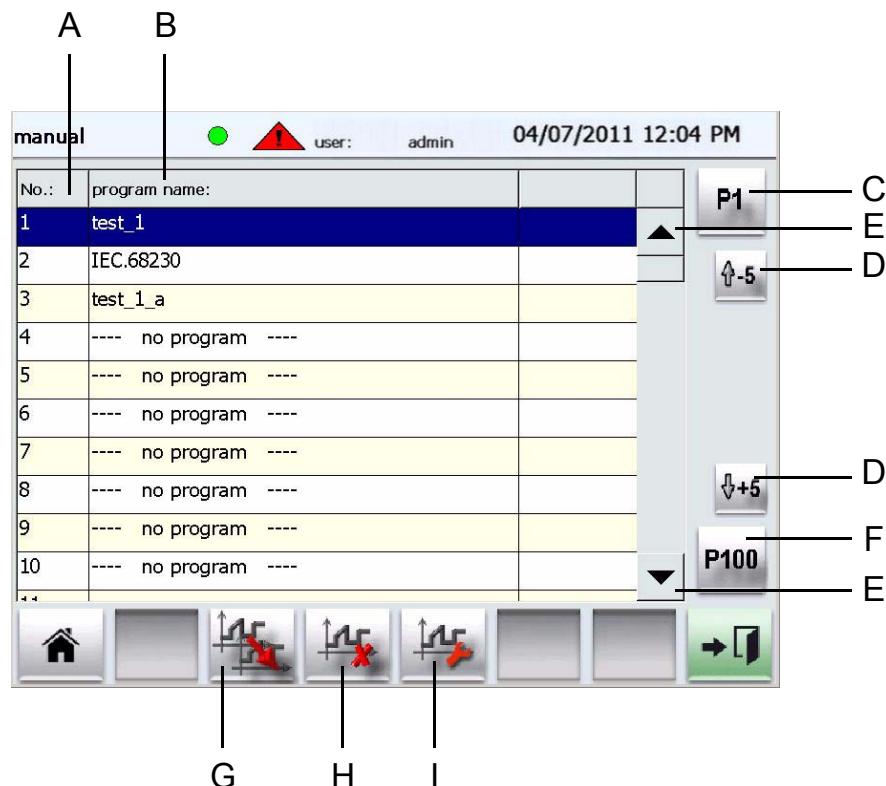
Program list

Fig. 5-1
Program list

- A Program number
- B Program name
- C Skip to program 1
- D Leaf through program list in increments of 5
- E Leaf through program list in increments of 1
- F Skip to program 100
- G Copy the program → 5.1.3 (page 63)
- H Delete the program
- I Edit the program → 5.1.1 (page 57)

**NOTE**

Up to 120 programs can be displayed. The programs in program locations 100 to 120 are write-protected and can be copied for processing to a program location lower than 100.

**NOTE**

Programs that are created using SimPATI can be started via the control unit but cannot be processed.

5.1.1 Edit the program

- Select the program to be edited from the program list.

The following menu appears:

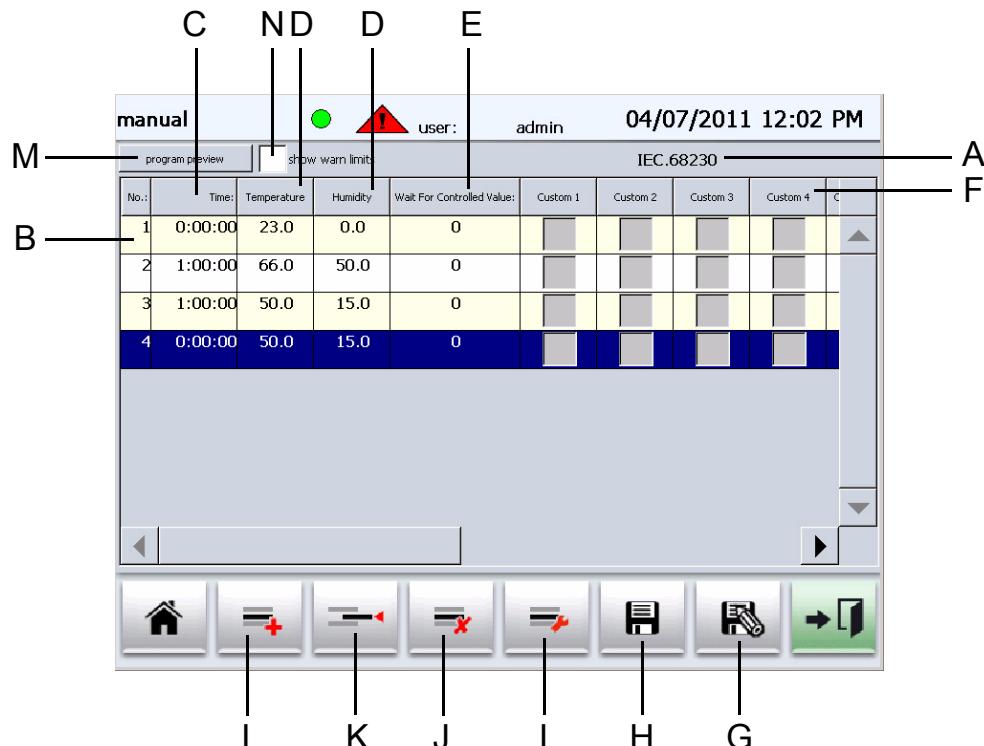


Fig. 5-2
Edit the program

- A Program name
- B Segment number
- C Segment time (→ page 60)
- D Control variable
- E Wait for control variable (→ page 60)
- F Channels → 4.3.1 (page 45)
- G Save program in → 5.1.1.3 (page 62)
- H Save program → 5.1.1.3 (page 62)
- I Edit segment → 5.1.1.1 (page 58)
- J Delete segment
- K Add segment
- L Insert segment
- M Program preview graphical representation¹⁾ → 5.1.1.2 (page 61)
- N Display warning limits



NOTE

In the program, each change in the profile (constant, jump or ramp) is depicted as a segment.

5.1.1.1 Edit the segment

- Refer to chapter 5.1.1, Fig. 5-2 (page 57)

Change the segments as follows:

- select the segment number to be changed.
- Press the Edit Segment  button.

The following menu appears:

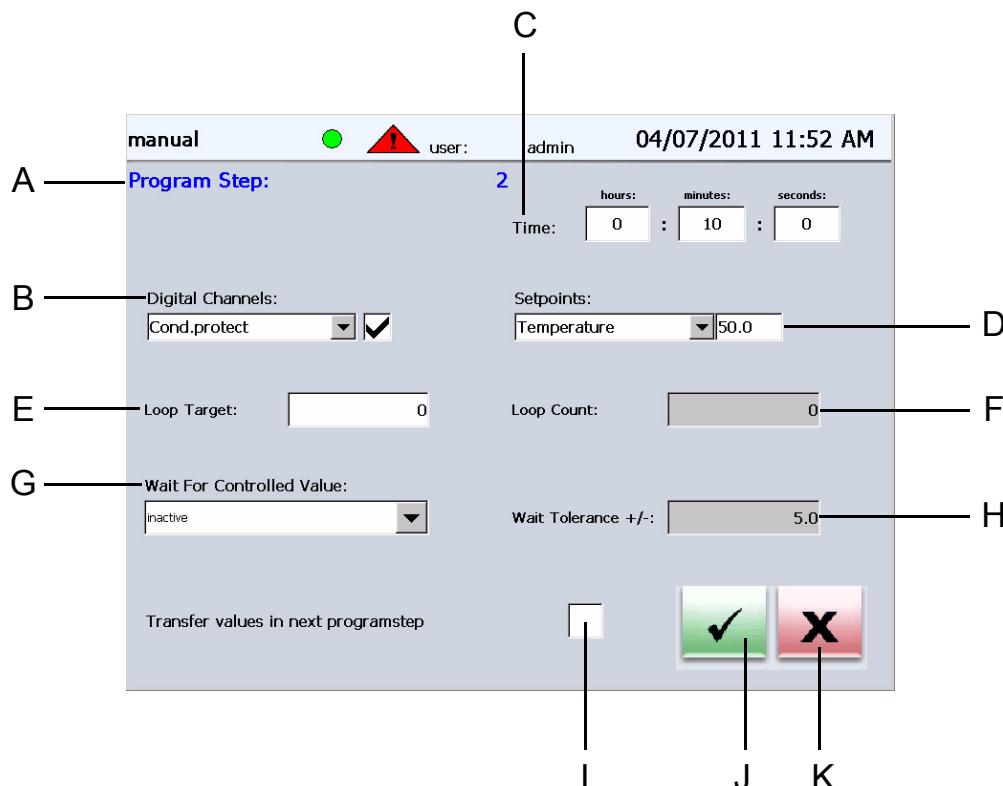
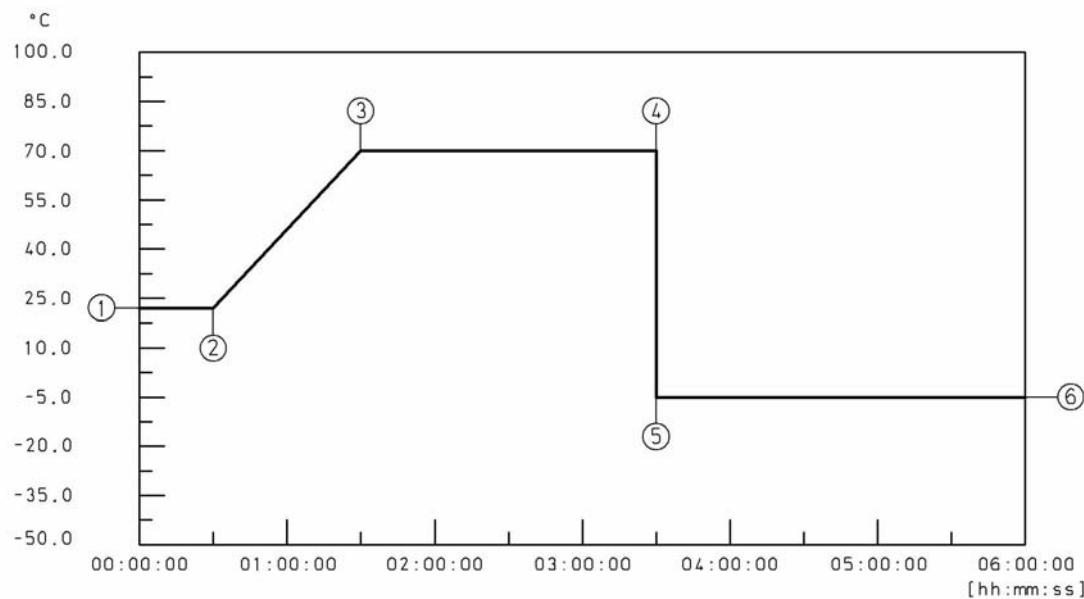


Fig. 5-3
Edit segment

- A Segment number
- B Additional function (Digital Channel) → 4.3.1 (page 45)
- C Segment time (→ page 60)
- D Control variable and nominal value
- E Define loop within the program (→ page 60)
- F Number of loops (→ page 60)
- G Wait for control variable (→ page 60)
- H Tolerance band (→ page 60)
- I Transfer values to the next program step (→ page 60)
- J Save segment
- K Exit menu without saving

Example of a program:

Segment No.	Time [h]	Nominal value [°C]
1	-	23.0
2	0.5	23.0
3	1.0	70.0
4	2.0	70.0
5	0.0	-5.0
6	2.5	-5.0

Segment time

Time allowed for constants, jump or ramp.

Segment loop

You can use this function to repeat several segments. The loop is attached at the end.

- select the last segment of the loop and define the beginning of the loop in it.
- specify the number of loops (repeats).

Wait for control variable

With this function it is possible for you to have the program continue to run with this segment alone once the control variable defined has reached its specified nominal value.

Tolerance band

Tolerance band in which the actual value ranges to the control variable.

Transfer values to the next program step

With this function the nominal values of the control variable and the activated additional functions are transferred to the next program step.

Insert, add, delete segment

»Add (after)«	A new segment is inserted after the last segment in the program. The nominal values of the control variables and the activated additional functions of the last segment are transferred
»Insert (before)«	A new segment is added after the marked segment. The nominal values of the control variables and the activated additional functions of the marked segment are transferred
»Delete segment«	The marked segment is deleted. Subsequent segments are renumbered serially

5.1.1.2 Program preview graphical representation¹⁾

- Refer to chapter 5.1.1, Fig. 5-2 (page 57)

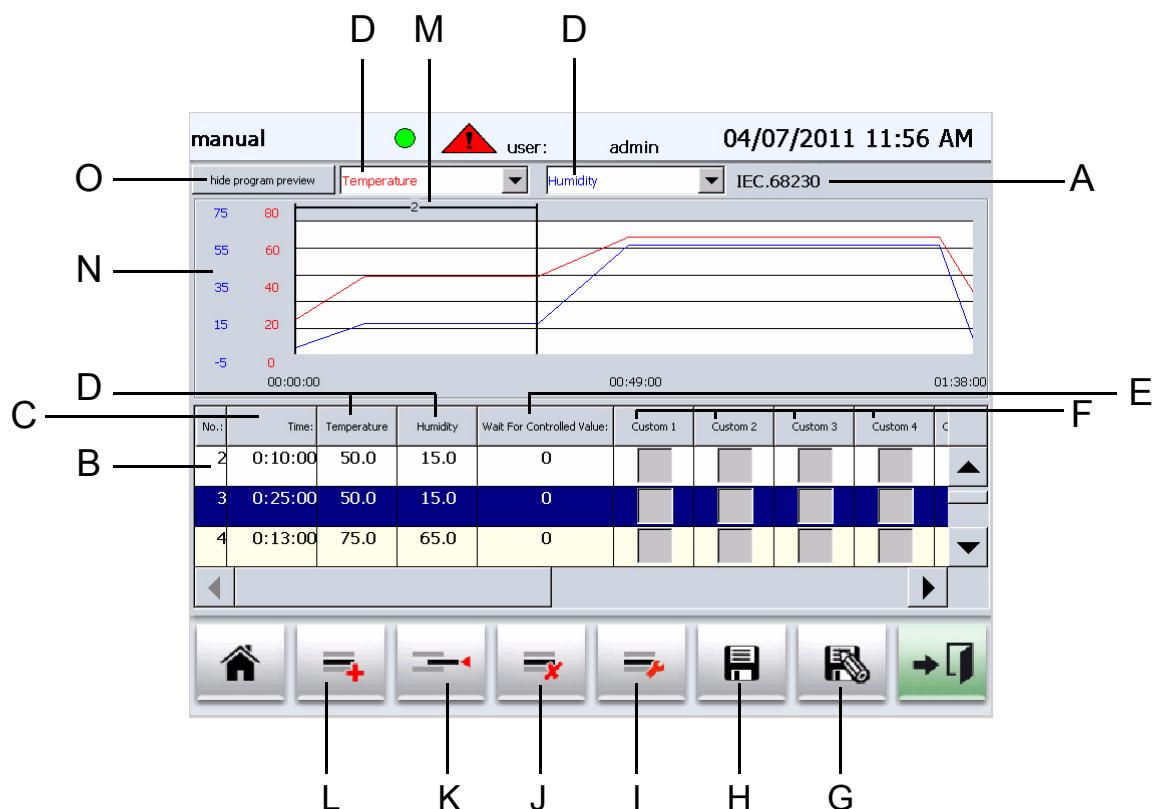


Fig. 5-4

Graphical representation of the program preview

- A Program name
- B Segment number
- C Segment time (→ page 60)
- D Control variable
- E Wait for control variable (→ page 60)
- F Additional functions (digital channels) → 4.3.1 (page 45)
- G Save program in → 5.1.1.3 (page 62)
- H Save program → 5.1.1.3 (page 62)
- I Edit segment → 5.1.1.1 (page 58)
- J Delete segment
- K Add segment
- L Insert segment
- M Program loop → (page 60)
- N Scale
- O Close program preview

5.1.1.3 Save program

- If you have changed the program, press the  button to overwrite the existing program.

or

- press the  button to save the program to another program slot.

5.1.2 Create program

- select a vacant program number from the program list (→ Fig. 5-1).
- Press the 

The program editing menu appears → Fig. 5-2 (page 57). The program only contains 1 segment.

- change the existing segments → 5.1.1.1 (page 58).
- using the  button insert the required segments one after the other.
- Once you have created the program, press the  button to save the program.

5.1.3 Copy the program

- Select the program to be copied from the program list (\rightarrow page 56).
- Press the  button.

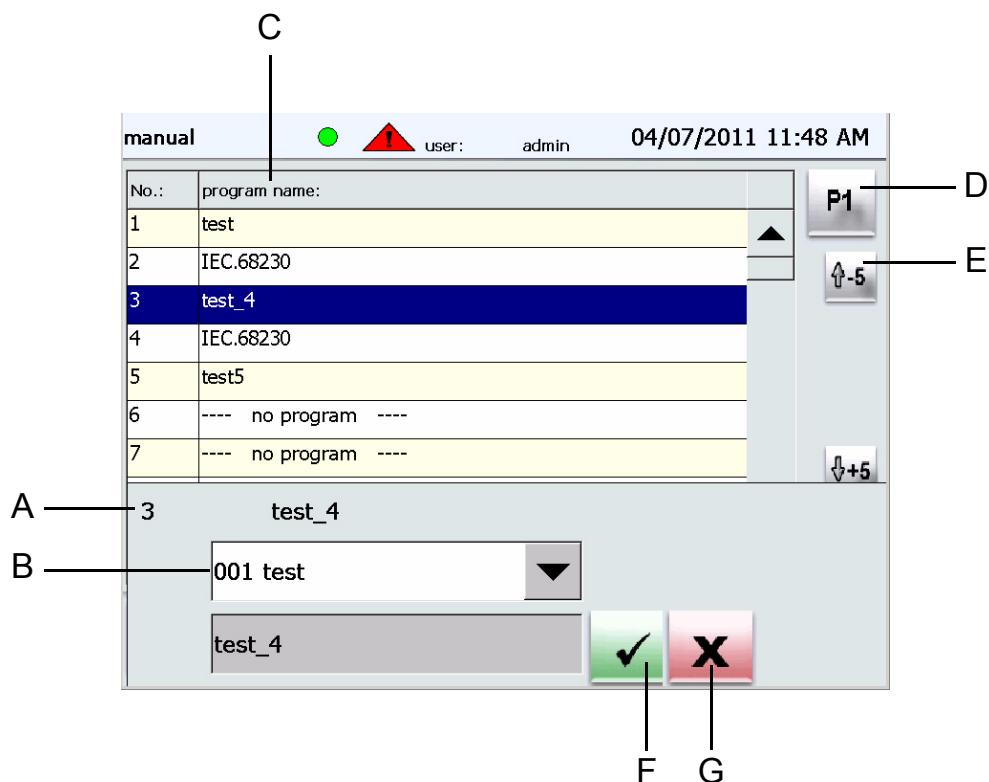


Fig. 5-5
Copy the program

- A Source program number and program name
 - B Program slot to be copied to
 - C Program list (\rightarrow page 56)
 - D Skip to program 1
 - E Leaf through program list in increments of 5
 - F Save program
 - G Exit menu
- Select the program number via the , which the copied program should be saved to.



NOTE

The copied program appears with the same name as the source program. You can edit the program as described in Chapter 5.1.1.



NOTE

Up to 120 programs can be displayed. Programs in program locations 100 to 120 are write-protected and can be copied for processing to a program location lower than 100.

6 TROUBLESHOOTING

The following messages are displayed on the control unit:

- Alarm messages (shown on a red background)
- Warning messages (shown on a yellow background)
- Information messages (displayed with a grey background)

With alarm signals, the test is stopped; with warning messages, the test remains active.

Every error, warning and information message from the device is entered in the error message list. The message number is displayed for each message.

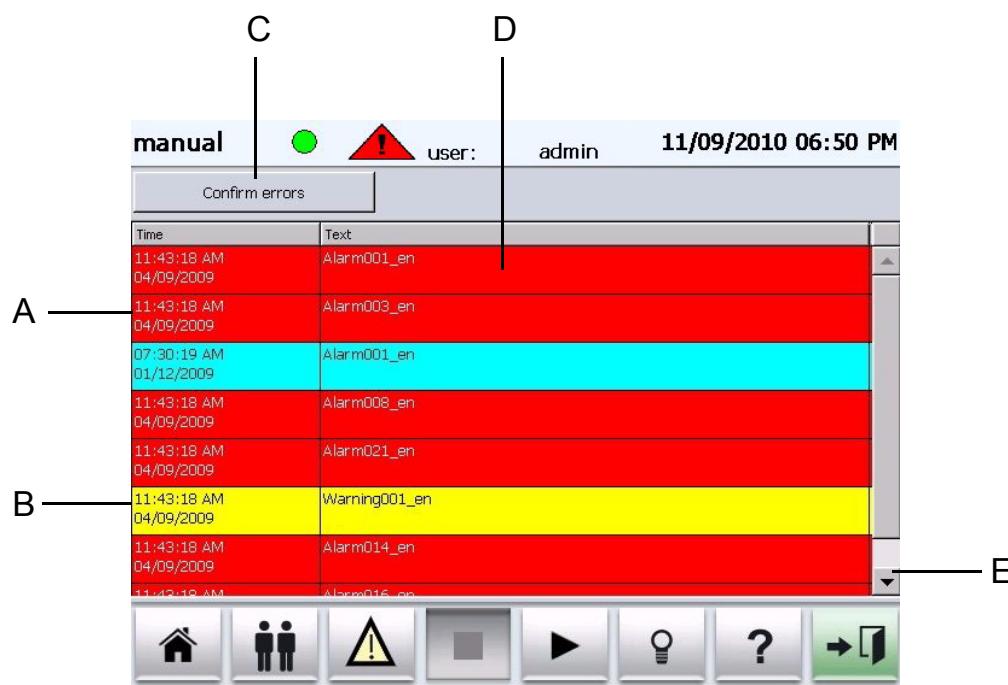


Fig. 6-1
Error message list

- A Active error message
- B Active warning message
- C Acknowledge fault message → 6.1 (page 66)
- D Message text with message number
- E display other messages



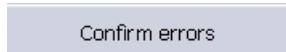
NOTE

If a malfunction occurs during program mode that results in a switch-off (stand-by) of the application, the program is stopped. If the error is rectified and the error message is acknowledged, the program continues from that point.

- To correct the error, note the error messages described in the operating manual for the device.

6.1 Acknowledge errors

Once the cause of the error has been corrected, the error message must be acknowledged.

- Select the appropriate message.
- press  to acknowledge the error.



NOTE

The acknowledged error message is deleted..

- Exit the menu with 
- To restart the program, press 

APPENDIX: INTERFACE PROTOCOL

If you do not use our operating software S!MPATI* for PC, the device may nevertheless be operated by means of your PC. However you will need some programming knowledge. You will have to write a control program. Use one of the regular programming languages (e.g. Turbo Pascal or C++).

The test chamber is provided with an Ethernet interface and an optional RS 232 interface¹⁾



NOTE

The INTERNAL / EXTERNAL mode set on the control unit is not supported, i.e. the unit can be operated both via the interface and via the control unit.

1 ASCII PROTOCOLS VIA ETHERNET INTERFACE

The client protocols ASCII-1 and ASCII-2 can be used via the network interface of the SimPac. In addition, the commands of the S!MPATI SimServ protocol are available. For information on the structure and syntax of the individual protocols, please refer to the respective operating manuals.

To use the commands of the ASCII protocols, create a control program with a programming language, which supports the socket API of the operating system (e.g. Microsoft Visual C++). At the SimPac test chamber, simply enter the network parameters (IP address).

1.1 Protocol server functions

The data transfer with the control system is realized by means of connection-oriented sockets (stream sockets). The application will take the role of the client, while the SimPac control system will be the server. The protocol server will use port **2049** to accept commands. The client connects with the server to be able to send and receive characters. On basis of the first received characters, the protocol server decides which protocol he is receiving:

STX („Start of text“, ASCII Code 2)	ASCII-1 protocol
\$	ASCII-2 protocol
other character	SimServ-protocol

The characters will be analyzed as soon as one of the following terminators was received:

ETX („End of text“, ASCII Code 3)
CR („Carriage Return“, ASCII Code 13)
LF („Line Feed“, ASCII Code 10)

The connection with the protocol server will be active until the client disconnects it or sends the command "quit".

1.2 Testing the protocol server

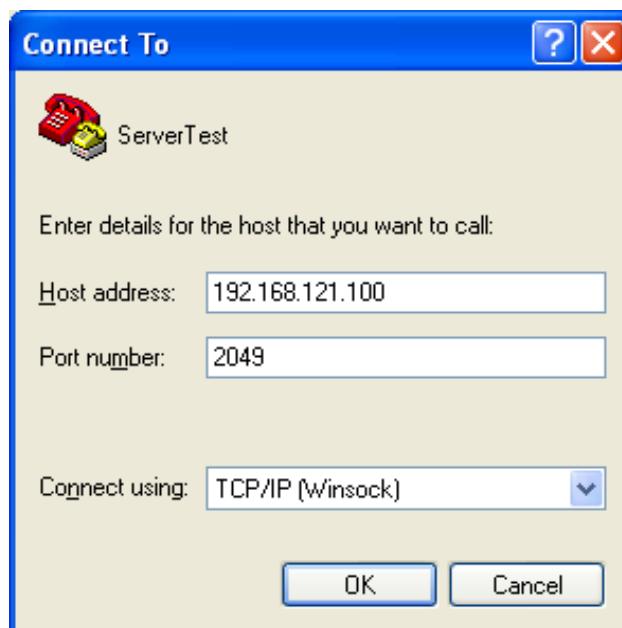
The protocol server of the SimPac control system may be tested without using a self-provided application. For this purpose, use port 2049 to connect the Telnet with the control system. To test the protocol server with the hyperterminal in the telnet mode using Windows XP:

HyperTerminal via „Start → All programs → Accessories → Communication → Start hyperterminal“.

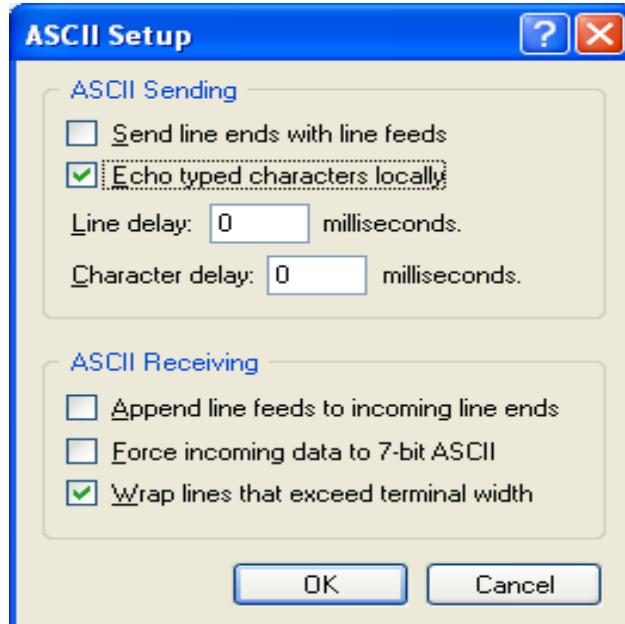
- 1 Create a new interface and enter the interface name.
- 2 Choose »TCP/IP (Winsock)« as connection type:



- 3 Enter the IP address (»Host address«) and port number (»Port number«) of the SimPac control system:



- 4 Go to menu "File → Properties → Settings → ASCII configuration" and choose option »Echo typed characters locally«.



- 5 Click on »Call« to connect with the server.
- 6 Request the actual values using the ASCII-2 command: Enter \$01I and press "Return". The control system responds with the actual value string.
- 7 Disconnect by using the »Disconnect« symbol.

2 ASCII PROTOCOLS VIA RS 232 INTERFACE

The following properties are valid for the data transfer between the control system and PC via the RS 232 interface:

- 9600 / 115200 Baud
- 1 Start bit
- 8 Data bits
- 1 Stop bit
- No parity
- No handshaking

3 ASCII-1

3.1 What can you do with your PC?

- Enter and query nominal values for parameters
- Query actual values for parameters
- Query and change status of the digital channels
- Query the temperature from a variety of standalone measurement sensors¹⁾
- start programs
- Specify how many times a program should run
- Stop programs
- Read the error status
- Read the error messages of the unit
- Acknowledge error messages



NOTE

If the unit has more than 2 analogue channels, we recommend using the ASCII 2 protocol, since it provides for easier control of the unit. The same applies if set values (e.g. ventilator speed¹⁾, blowdown¹⁾ are to be set or queried.

3.2 How the program works

The program sends a string to the controller. The program uses this send string to request data. The controller responds to this string by sending a response string back to the PC.



WARNING

Communications between the PC and the controller in the unit will not work unless you link the "check sum" »routine« into your control program → 3.4 Program section »Checksum« (page 9).

3.2.1 General guidelines for send string

A string contains a series of ASCII characters. Before each send string, you must enter the ASCII character to mark the start of text. After each send string, you must enter the ASCII character to mark the end of text.

Start of text	»start of text {STX}«	ASCII code 02
End of text	»end of text ({ETX})«	ASCII code 03



NOTE

*These characters are omitted in the following examples for simplification purposes.
The bus address of the unit is represented by z and the checksum to be calculated is 7represented by CC.*



WARNING

The controller processes data slower than a PC. Therefore do not send more than one string per second. Otherwise the processes in the controller (open and closed-loop control) may be disrupted.

3.2.2 General guidelines for response string

The response string contains two extra characters:

{ACK} (acknowledged)	The controller recognised and accepted the send string from the PC	ASCII code 06
{NCK} (not acknowledged)	The send string was not recognised	ASCII code 15

3.3 Send strings of the ASCII-1 interface protocol

3.3.1 Read actual values

The following string asks for the current status of the unit.

3.3.1.1 Send string (PC → controller)

The string reads as follows: {STX}z?xx{ETX}

{STX}	
z	Bus address of the unit
?	Request to send
xx	Checksum
{ETX}	

Example:

z	= 1
xx	= 8E

3.3.1.2 Response string (controller → PC)

The following string contains information on reference and actual values for parameters, together with various other settings.

The string reads as follows:

{STX}1T018.5F066.0P0T000.0#--T010.0F090.0R10000000000000002B{ETX}

{STX}	
1	Bus address of the unit
T018.5	Actual value of parameter 1: 18,5
F066.0	Actual value of parameter 2: 66
P0	Printer is off =0, on =1
T000.0	Temperature on standalone temperature measurement sensor ¹⁾
#	Unit is switched on = #, switched off = \$
--	Number of reported errors (no errors= --)
T010.0	Nominal value of parameter 1: 10
F090.0	Nominal value of parameter 2: 90
R1000000000000000	Digital channels: off =0, on =1
2B	Checksum
{ETX}	

3.3.2 Set nominal values for parameters

The following string sets the nominal value for parameter 1 to 25 and the nominal value for parameter 2 to 35 and starts operation.

3.3.2.1 Send string (PC → controller)

zT025.0F35R1100000000000000CC

3.3.2.2 Response string (controller → PC)

z{ACK}CC	the string was accepted
z{NAK}CC	the string was not accepted e.g. because a nominal value was above or below the set limit.



NOTE

The send string always consists of nominal values for two parameters as well as 16 digital channels. For units with one parameter, the second parameter is ignored.

3.3.3 **Querying temperature from standalone measurement sensors¹⁾**

The following string reads the measured temperature value from standalone temperature measurement sensors¹⁾.

3.3.3.1 **Send string (PC → controller)**

z:Get:P_Var:xxx:CC

XXX 216, 217, 218 or 219 for temperature sensors 1 to 4

3.3.3.2 **Response string (controller → PC)**

z:Get:P_Var:216:32.5:CC

Actual value temperature measurement sensor 1 (P_Var216) = 32.5°C

3.3.4 **Start program**

The following string starts a program..

3.3.4.1 **Send string (PC → controller)**

z:Set:AutoStart:xxx:CC

XXX 1 to 120 (program number)

3.3.4.2 **Response string (controller → PC)**

z{ACK}CC if the program was started

z{NAK}CC if the program slot is empty

3.3.5 **Specifying the number of program repeats**

The following string specifies the number of program repeats.

3.3.5.1 **Send string (PC → controller)**

z:Set:AutoLoop:xxx:CC

XXX 1 to 9999 (number of program repeats)

3.3.5.2 **Response string (controller → PC)**

z{ACK}CC

3.3.6 **Stopping program**

The following string stops a running program.

3.3.6.1 **Send string (PC → controller)**

z:Set:AutoStop:CC

3.3.6.2 **Response string (controller → PC)**

z{ACK}CC

3.3.7 **read error status**

The following string displays a bit pattern of all current errors.

3.3.7.1 **Send string (PC → controller)**

`z:Get:Errors:CC`

3.3.7.2 **Response string (controller → PC)**

`z:Get:Errors: 1:100000000 ... 0000000000000000:CC`

Cumulative error	1	there is still at least one error present
	0	there is no error present

The following 64-place bit pattern displays the fault messages still present, read from left to right. A "1" in the far left of the bit pattern therefore means that error No. 1 is still there.

3.3.8 **Reading error messages**

The following string reads the error message of an error number.

3.3.8.1 **Send string (PC → controller)**

`z:Get:ErrorText:xx:CC`

xx Number of the error message whose text should be read

3.3.8.2 **Response string (controller → PC)**

`z:Get:ErrorText:xx:Errortext:CC`

e.g.: `z:Get:ErrorText:16:Power fail:<CC>`

or

`z{NAK}CC` if the error message does not exist

3.3.9 **Acknowledge the fault.**

The following string acknowledges all reported, acknowledgeable errors.

3.3.9.1 **Send string (PC → controller)**

`z:Set:ErrorQuit:CC`

3.3.9.2 **Response string (controller → PC)**

`z{ACK}CC`

3.4 Program section »Checksum«

The checksum is the complement of the Modulo-256 remainder following the division of the ASCII values of all the characters in the string; the values for ETX and the checksum itself are not included.

Each send string must contain a checksum!



NOTE

The checksum is a way of cross-checking the ASCII values in a string, including the ASCII value of »STX«. The ASCII value for »ETX« and the checksum are not included. The checksum is shown in upper case characters, e.g. 8E.

Programming language: C++

```
const char ASCII[ ]= "0123456789ABCDEF";
char *Checksum (char *buffer)
{
    static char Hex[10];
    static int a1, a2;
    register unsigned int i;
    int sum;

    sum = 256;
    for ( i=0 ; i<strlen(buffer) ; i++ )
    {
        sum-=buffer[i];
        if ( sum<0 )
            sum+= 256;
    }
    a1 = (sum & 0xF0) >> 4;
    a2 = sum & 0x0F;
    Hex[0] = ASCII[a1];
    Hex[1] = ASCII[a2];
    Hex[2] = 0;
    return(Hex);
}
```



NOTE

To verify that the checksum has been calculated correctly, use the example of the send string in Chapter → 3.3.1 Read actual values (page 6). You must obtain »8E« for the checksum.

The controller checks the checksum of the send string to prevent transmission errors.

4 ASCII-2

4.1 What can you do with your PC?

- Set and query nominal values for parameters
- Query actual values for parameters
- Query and change status of the digital channels
- Set change rates for fluctuating nominal values¹⁾
- Starting and stopping programs
- Reading error messages
- Acknowledge error messages

4.2 How the program works

The program sends a string to the controller. The program uses this send string to request data. The controller responds to this string by sending a response string back to the PC.

4.2.1 General guidelines for send string

A string contains a series of ASCII characters. Before each send string, you must enter the ASCII character to mark the start. After each send string, you must enter the ASCII character to mark the end.

Start	'\$'	ASCII code 36
End	<CR> Carriage Return	ASCII code 13

4.3 Send strings of the ASCII-2 interface protocol

4.3.1 Read actual values

The following string asks for the current status of the unit.

4.3.1.1 Send string (PC → controller)

The string reads as follows: \$01I<CR>

```
$  
01      Bus address of the unit  
I       Request to send the actual status  
<CR>
```

4.3.2 Response string (controller → PC) for a unit with 2 parameters

The following string contains nominal and actual values for temperature and humidity²⁾ together with various other parameters.

The values are instantaneous values:

The string reads as follows:

```
0023.0 0020.5 0050.0 0041.0 0080.0 0080.0 0000.0 0020.0 0000.0 0020.2 0000.0 0020.3  
0000.0 0020.4 0110101010101010101010101010 <CR>
```

0023.0	Nominal value of parameter 1
0020.5	Actual value of parameter 1
0050.0	Nominal value of parameter 2
0041.0	Actual value of parameter 2
0080.0	Set value 1
0080.0	Set value 1
0000.0	Not used
0020.0	Actual value Pt100-1 (°C, analogue I/O card) ¹⁾
0000.0	Not used
0020.2	Actual value Pt100-2 (°C, analogue I/O card) ¹⁾
0000.0	Not used
0020.3	Actual value Pt100-3 (°C, analogue I/O card) ¹⁾
0000.0	Not used
0020.4	Actual value Pt100-4 (°C, analogue I/O card) ¹⁾
0	Unused digital output 0
1	digital output 1
1	digital output 2
010101010101010101010101010101010	Other digital outputs
<CR>	

4.3.3 Set nominal values for parameters

The following string sets the nominal value for parameter 1 to 25 and the nominal value for parameter 2 to 50 and starts operation.

The string reads as follows:

\$01E 0023.0 0050.0 0080.0 0000.0 0000.0 0000.0 0000.0 011010101010101010101010101010 <CR>

\$01E	
0023.0	Nominal value of parameter 1
0050.0	Nominal value of parameter 2
0080.0	Set value 1
0000.0	Not used
0000.0	Not used
0000.0	Not used
0	Unused digital output 0
1	digital output 1
1	digital output 2
010101010101010101010101010101010	Other digital outputs
<CR>	

NOTE

It is important that the nominal values be within their respective limits (e.g. temperature range) or the command will not be carried out correctly. You can find the allowable limit values in the query command described in → 4.3.8 (page 14).

NOTE

32 digital channels are always transmitted. If the controller has fewer outputs, the non-existent channels are shown as 0. Each nominal analogue value is separated with a space.

NOTE

To operate the ASCII protocol, use the touch panel to set the operating mode on “EXTERNAL“. Devices, which are not equipped with a touch panel, will be set automatically on the “External” operating mode.

4.3.4 Setting change rates¹⁾

The following string allows you to set gradients for the change rate of nominal values. For both temperature and relative humidity²⁾, two gradients are set for heating/cooling and humidifying/dehumidifying respectively.

The string reads as follows:

\$xxU aaaa.a bbbb.b cccc.c dddd.d <CR>

aaaa.a	Heating gradient (K/min, for example, 0003.0 = 3 K/min)
bbbb.b	Cooling gradient (positive sign symbol!) (K/min, for example, 0003.0 = 3 K/min)
cccc.c	Humidifying gradient (%r.h./min, for example, 0002.5 = 2,5 K/min)
ddd.d	Dehumidifying gradient (positive sign symbol!) (%r.h./min, for example, 0002.5 = 2,5 K/min)
xx	Unit address (1 to 32)

NOTE



Only one gradient may be set for each variable (e.g. for heating), the other (e.g. cooling) should be equivalent to zero. The new setpoint value must suit the gradient direction (increasing or decreasing). Gradient calculation is deactivated if both gradients are set to zero.

4.3.5 Starting and stopping programs

The following string starts a program.

4.3.5.1 Send string (PC → controller)

\$xxPyyy<CR>

xx	Bus address of the unit (1 to 32)
yyy	Program number (1 to 120)

4.3.5.2 Response string (controller → PC)

0 <CR>if the program could be started

A running program can be stopped with the following string:

4.3.5.3 Send string (PC → controller)

\$xxP0000<CR>

xx	Bus address of the unit (1 to 32)
----	-----------------------------------

1) option

2) climatic test systems only

4.3.6 Reading error messages

The following string always displays the first appearing error with error number and error text.

4.3.6.1 Send string (PC → controller)

\$xxF<CR>

xx Bus address of the unit (1 to 32)

4.3.6.2 Response string (controller → PC)

<Error number><Empty spaces><Error text><CR>

e.g.: 16 Power fail<CR>

or:

0 <CR>if there are no errors present



NOTE

Only the first error is displayed in each case.

4.3.7 Acknowledge error messages

The following string acknowledges all errors.

4.3.7.1 Send string (PC → controller)

\$xxQ<CR>

xx Bus address of the unit (1 to 32)

4.3.7.2 Response string (controller → PC)

xx<CR>

xx Number of errors still present

4.3.8 Description of the I- and E-rate

The query can be made via the hyperterminal, for example, taking into account the interface setting (→ page 1), by entering \$xx?.

4.3.8.1 Send string (PC → controller)

\$xx?

xx Bus address of the unit (1 to 32)

The structure of the strings, limits, setpoint values, manipulated variables and digital channels are output for the unit configurations.

5 PROGRAMMING EXAMPLE FOR THE ETHERNET INTERFACE

The following program demonstrates the use of sockets under Windows and gives an example of how to poll the actual values using all three protocols:

```
*****
```

file: TCPIPClient.c

Sample TCP client for SimPac
(Win32 console application, Microsoft Visual C++ 5.0/6.0)

purpose:

This program demonstrates how to use sockets to send ASCII commands to the SimPac protocol server

```
*****
```

```
#include <string.h>
#include <stdio.h>
#include <winsock.h>

/* special characters */
#define STX 2 /* start of text */
#define ETX 3 /* end of text */
#define DLIM 182 /* delimiter */

/* open_socket
   creates a stream socket and connects to host ip
*/
int open_socket (char *ipaddr, unsigned short port, SOCKET *sock)
{
    struct sockaddr_in saddr; /* remote socket address */

    /* init socket address structure */
    saddr.sin_family = AF_INET;
    saddr.sin_port = htons(port);
    saddr.sin_addr.s_addr = inet_addr(ipaddr);

    /* create socket */
    *sock = socket(AF_INET, SOCK_STREAM, IPPROTO_TCP);
    if (*sock == INVALID_SOCKET)
    {
        printf ( "\nError creating socket.");
        return (-1);
    }
    else
    {
        /* Connect to host */
        if (connect(*sock, (struct sockaddr *)&saddr, sizeof(SOCKADDR)))
        {
```

```

        printf ( "\nCannot establish connection.");
        return (-1);
    }
    return (0);
}

/* function: send_command
   sends characters to socket
*/
int send_command (SOCKET so, char *cmd)
{
    int len, numsent;

    printf ("\nOutput: %s", cmd);
    len = strlen(cmd);
    numsent = send (so, cmd, len, 0);

    if (numsent != len)
    {
        printf ( "\nError sending.");
        return (-1);
    }
    else
        return 0;
}

/* function: receive_answer
   reads characters from socket
*/
int receive_answer (SOCKET so)
{
    char RecString [1000]; /* receive buffer */
    int numrec; /* number of received characters */

    numrec = recv (so, RecString, 1000, 0);
    switch (numrec)
    {
        case -1: printf ("\nError receiving");
        break;
        case 0: printf ("\nConnection close by server");
        break;
        default :
        {
            RecString [numrec] = 0; /* terminate string */
            printf ("\nInput: %s\n", RecString);
        }
    }
    return numrec;
}

```

```

}

/* main program
*/
int main(int argc, char* argv[])
{
    WSADATA m_wsaData;

    char IPdotDec [20]; /* remote IP address in dotted notation */
    unsigned short port; /* port to connect to (2049) */
    SOCKET s;

    char Command [100];

    if (argc != 3)
    {
        printf ("Usage: TCPIPClient [IP address] [port]");
        exit (0);
    }
    else
    {
        strcpy (IPdotDec, argv[1]);
        port = atoi (argv[2]);
    }

    /* Init WinSock DLL */
    if (WSAStartup(0x101, &m_wsaData))
    {
        printf ("\nUnable to initialize WinSock library.");
        return(-1);
    }

    /* send ASCII-1 protocol command */
    printf ("\nASCII-1 protocol");
    printf ("\n-----");
    if (open_socket (IPdotDec, port, &s) == 0)
    {
        sprintf (Command , "%c1?8E%c", STX, ETX);
        send_command (s, Command);

        Sleep(10);
        receive_answer (s);

    }
    closesocket(s);
}

```

```

/* send ASCII-2 protocol command */
printf ("\nASCII-2 protocol");
printf ("\n-----");
if (open_socket (IPdotDec, port, &s) == 0)
{
    sprintf (Command , "$01\r");
    send_command (s, Command);

    Sleep(10);
    receive_answer (s);
}

closesocket(s);

/* send SimServ command */
printf ("\nSimServ protocol");
printf ("\n-----");
if (open_socket (IPdotDec, port, &s) == 0)
{
    sprintf (Command , "11004%c1%c%d\r", DLIM, DLIM, 1);
    send_command (s, Command);

    Sleep(10);
    receive_answer (s);
}

closesocket(s);

return 0;
}

```

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