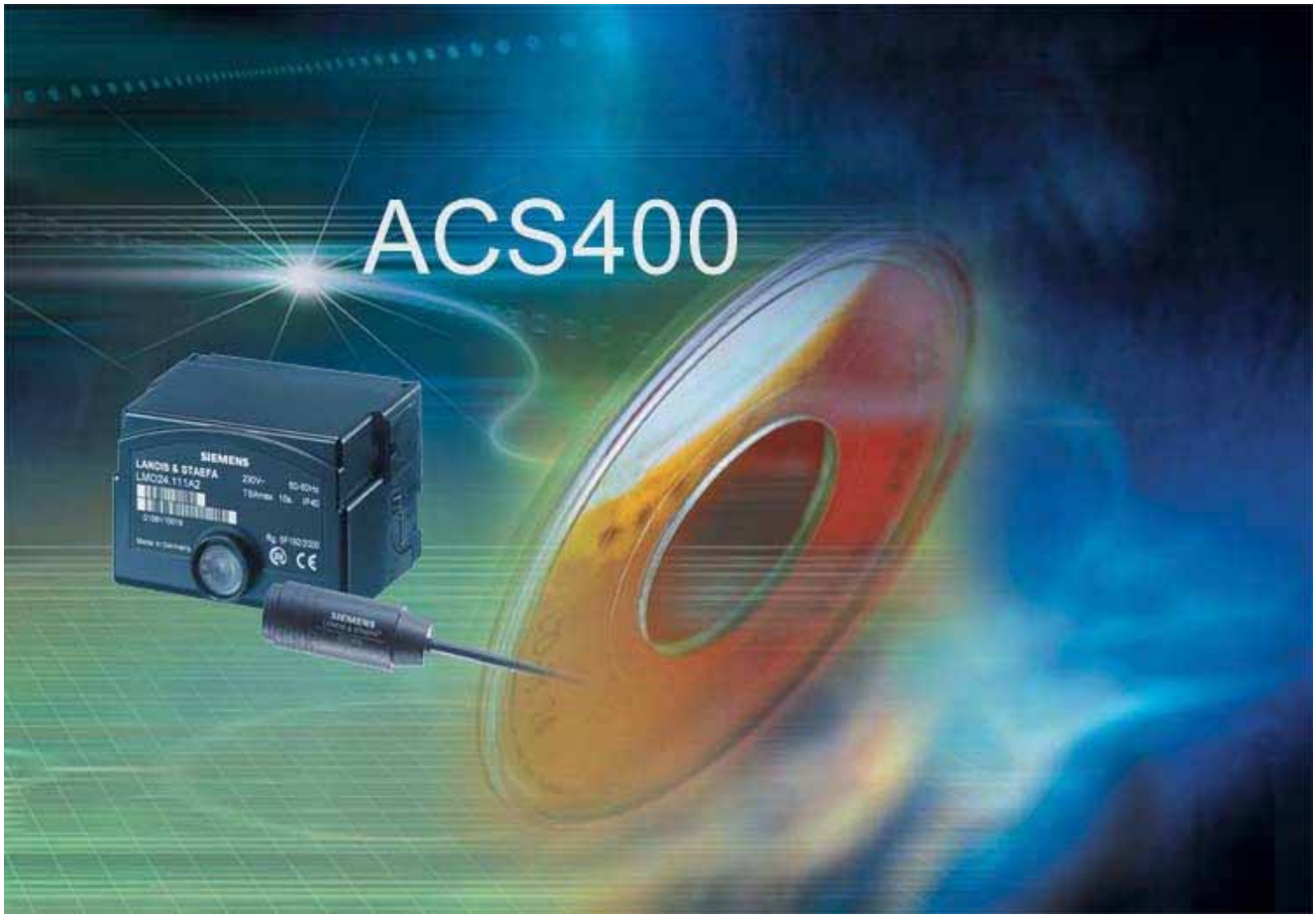
SIEMENS



ACS400
PC Software for microprocessor-based Burner Controls
Installation and Operating Instructions

For use with software version 2.1.7 or higher.

Date of issue: January 22, 2004

Contents

1 Introduction

1.1 General

The ACS400 software package is a convenient tool designed for visualizing, storing and transmitting all data delivered by advanced microprocessor-based burner controls made by Siemens HVAC Products.

The ACS400 operating software provides the following operating functions:

- Reading the burner control's operating states and types of errors that can occur
- Data logging (logging, triggering and presenting the data delivered by the burner control)
- Printing functions for producing documentation

All key data can be saved in files and retrieved at a later time, even without having the burner control connected.
Operation of the program is primarily based on Windows standards and requires basic knowledge of software programs.

This document was issued on December 12, 2003, and covers ACS400 software version 2.1.7 or higher.

2 System requirements

- Pentium, min. 350 MHz (more computing power recommended for data logging)
- IBM or IBM-compatible
- Windows 95, 98, 98SE, ME, 2000, XP, NT min. SP 3
- Min. 10 MB free hard disk storage (data logging requires additional storage space)
- Min. resolution 800 x 600, 256 colors
- Min. 128 MB RAM
- Free serial RS-232 COM port; alternatively, a USB RS-232 adapter can be used if a USB COM port is available.
- Mouse or touch pad
- CD-ROM drive
- Option: Internet access

To be able to use the ACS400 software and online documentation, the following additional components are required:

Hardware

- Opto-electronic interface OCI400 for UDS communication

  or, optionally,

- Communication interface for eBus or BSB

Software

To be able to read the online documentation, the Adobe Acrobat Reader is required.

Freely available under: www.adobe.com

3 Typographical conventions

3.1 Safety guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle, arrow or hand and are marked as follows according to the level of danger:

	**Danger**	indicates that death, severe personal injury or substantial property damage **will** result if proper precautions are not taken.
	**Warning**	indicates that death, severe personal injury or substantial property damage **can** result if proper precautions are not taken.
	**Caution**	indicates that minor personal injury or property damage can result if proper precautions are not taken.
	**Note**	draws your attention to particularly **important information** on the product, handling the product, or to a particular part of the documentation.
⇨	**Reference**	makes reference to **additional information** given in other pieces of user documentation, chapters or sections.

Qualified personnel

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct usage

Note the following:

This device and its components may only be used for the applications described in the technical documentation, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens HVAC Products.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

4 License and liability regulations

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Caution

6. SPECIAL NOTE

In cases where the SOFTWARE can be or is used for setting the parameters of combustion plant, the licensee and any user will assume special responsibility. After parameterization, both the licensee and the user are committed to verify the safe functioning of the plant and to ensure manual shutdown, if required. The licensee, the OEM, or the user who made the settings will always take full responsibility for the parameters, their settings and compliance with the relevant national and international standards and safety regulations. The safety notes given in the respective documentation must be strictly observed. L&S and its suppliers and other group companies of Siemens AG will not assume any liability for special or indirect damage, consequential damage, other damage, or damage resulting from incorrect parameter settings.

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9. APPLICABLE LAW AND JURISDICTION

This LICENSE AGREEMENT shall be governed by German law excluding any collision law. Place of jurisdiction shall be Rastatt, Germany, if the licensee is a businessman.

5 Languages

The ACS400 software package is available in German, English, French, Italian, Danish Spanish and Dutch. The required language can be selected under menu item ***Language***.

6 Installing / uninstalling ACS400 software

6.1 Installing ACS400

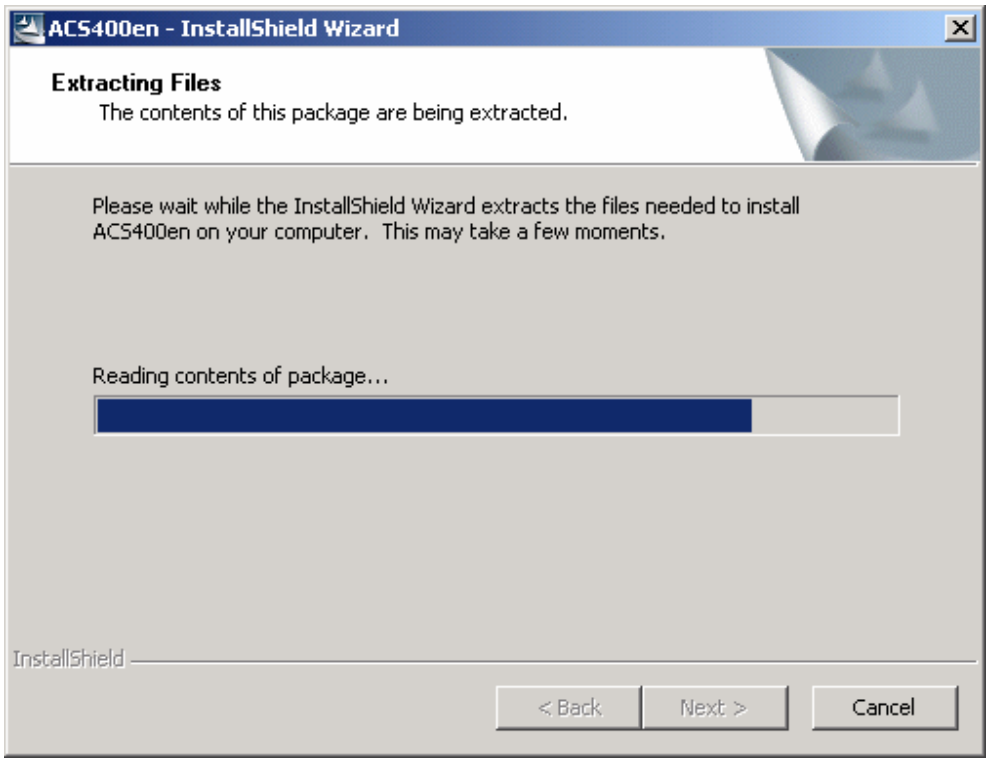
Before installing the software package, all active applications that are not really required should be closed.

Insert the ACS400 software CD into the CD-ROM drive of your computer.

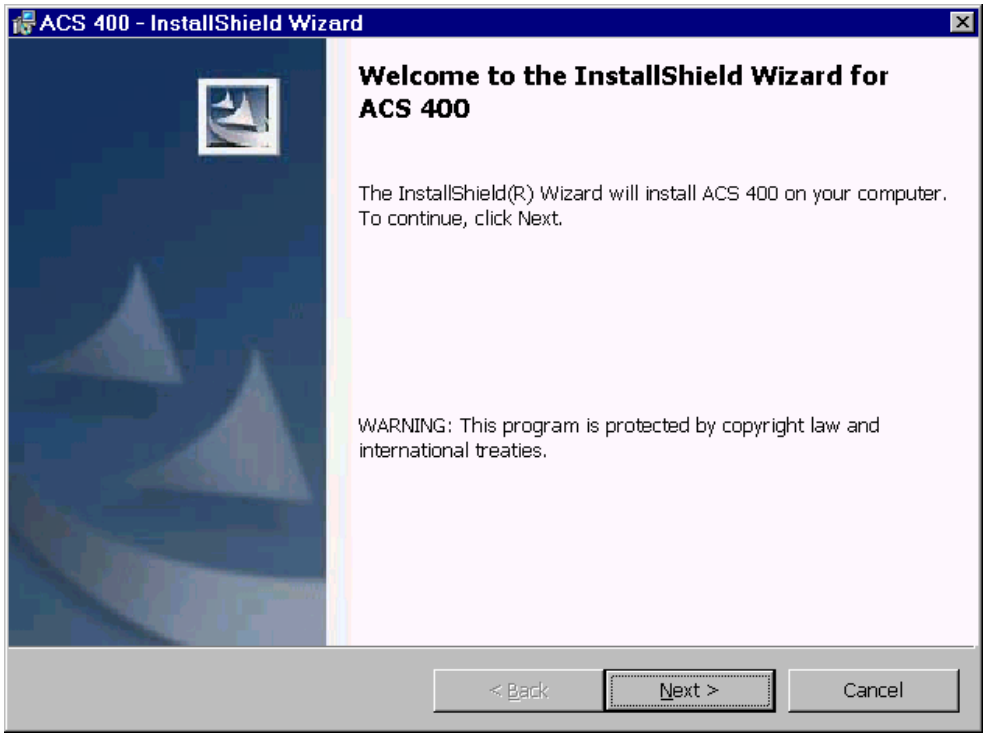
> Windows: If the installation program does not automatically start, select ***Execute*** from the Windows start menu. Then, type **d:\start.htm** (replace **d** by the letter of the CD-ROM drive) and click ***OK***.

Select the language you require for the setup.

Next, select the option for the direct execution of the program file without saving the file. Depending on the settings made and the type of operating system, a warning note may appear. Confirm with ***Yes*** to display the "InstallShield" window.

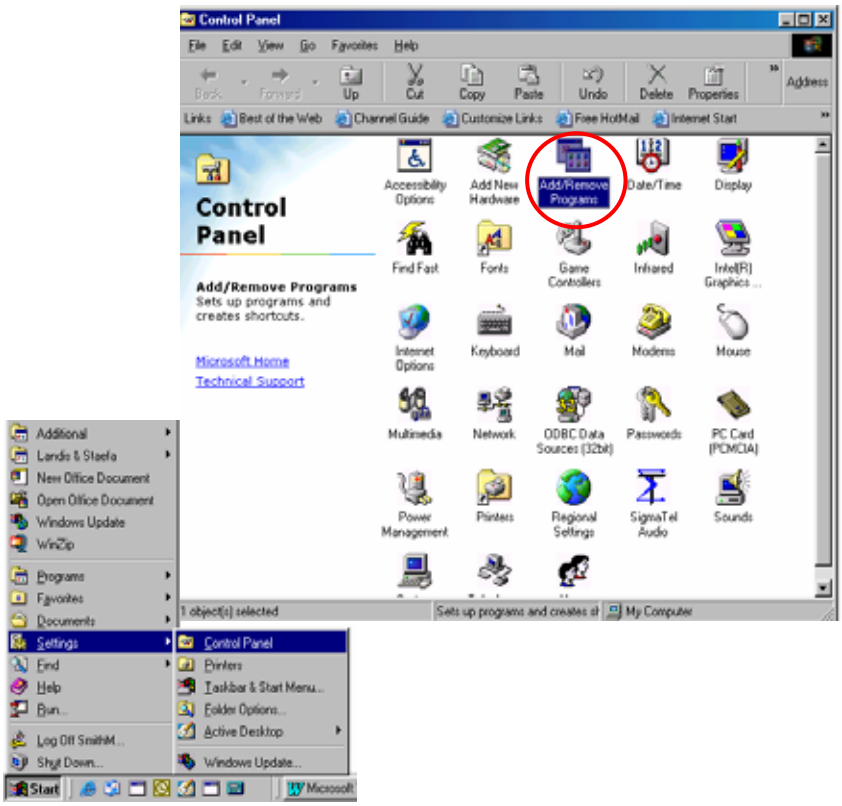


Follow the Installation Instructions.

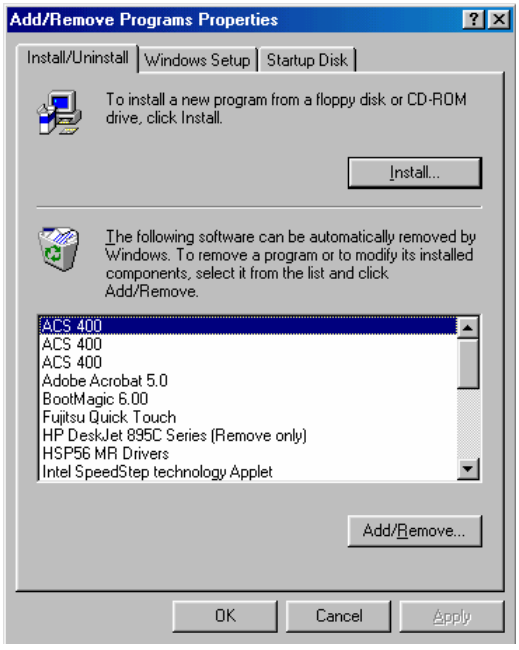


6.1.1 Repairing the program

This function installs missing files or corrects damaged files, links and registration entries. From the Windows start menu, select ***Settings*** and then under ***Control Panel*** click on the ***Add/Remove Programs*** icon to open the program.

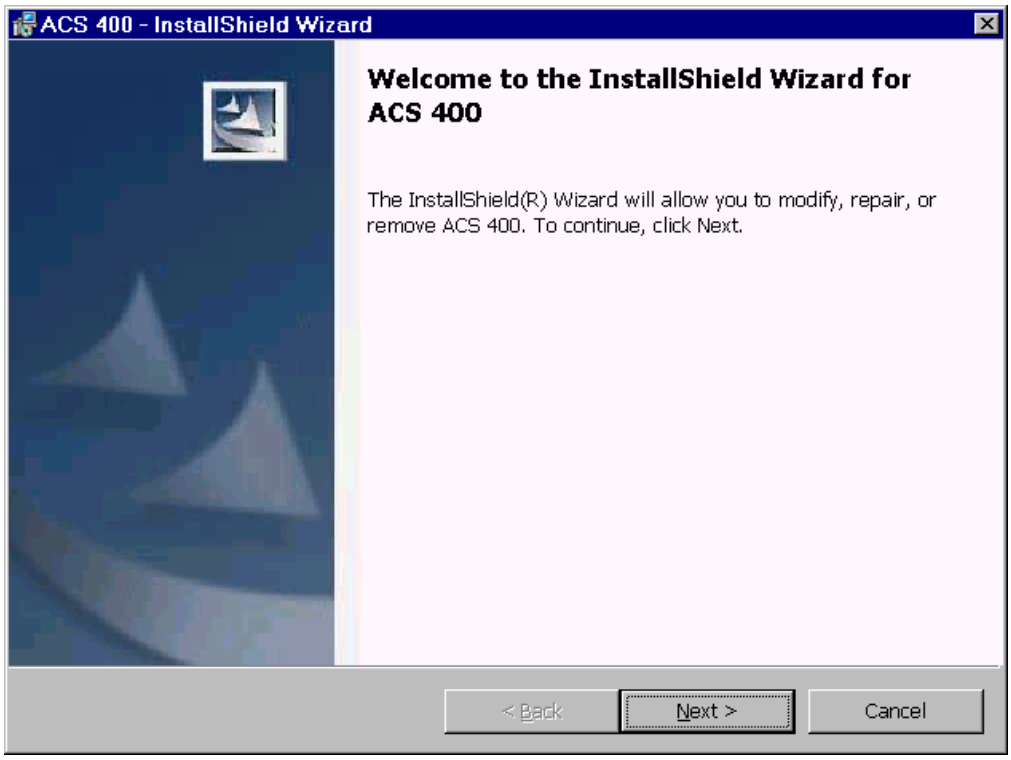


Highlight ***ACS400*** and select ***Add/Remove***.



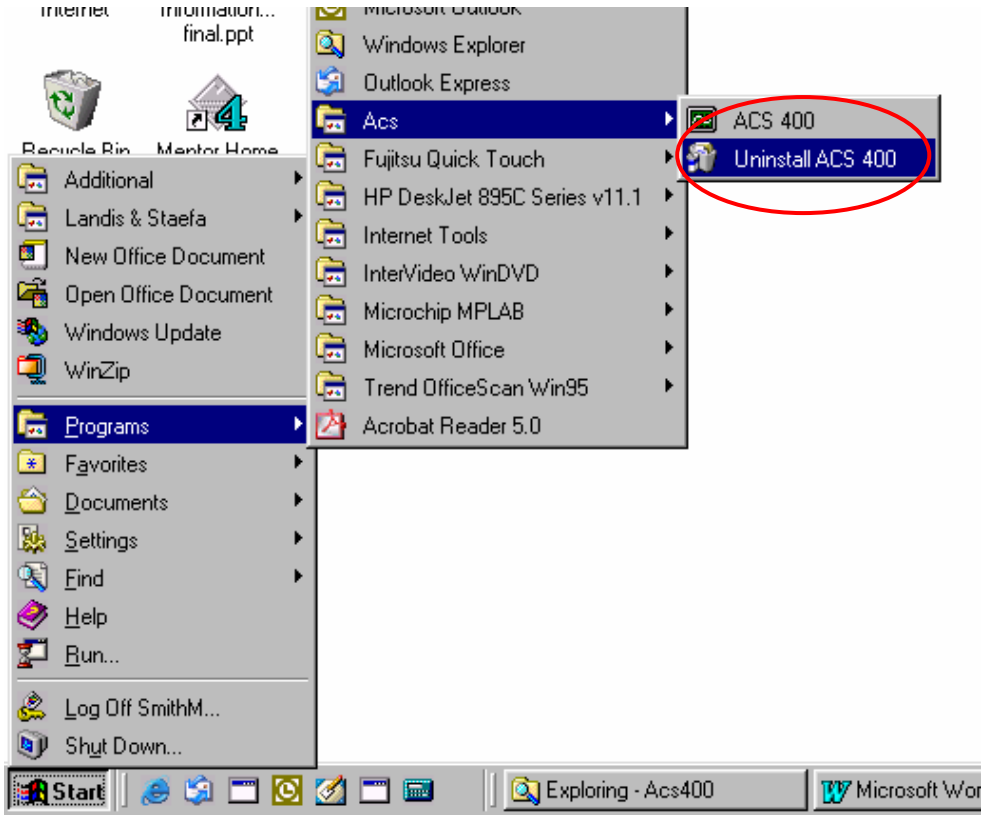
Cont`d
6.1.1 Repairing the program

Follow the instructions of “InstallShield”.



6.2 Uninstalling ACS400

From the Windows start menu, select ***Programs*** – ***ACS*** – ***Uninstall ACS400.***



6.3 Files contained in the scope of delivery

The software CD contains the files in a condensed form. These are unpacked during installation and filed on the destination drive in the selected directory.

The following files are required and installed for running the ACS400:

Installation directory:

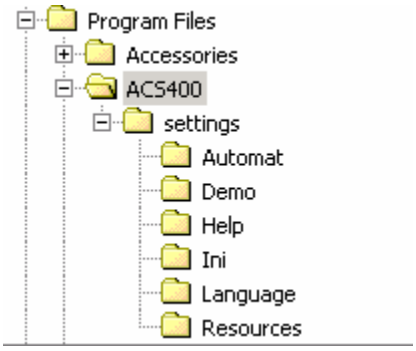
ACS.exe

Windows system directory:

- PropertyWindow5.ocx
- ScrollBarFix.ocx
- SplitterControl.ocx
- ssa3d30.ocx
- ssdw3b32.ocx
- ssmedt32.dll
- sspng2.dll
- ssprn32.dll
- sssplt30.ocx
- sstbars.ocx
- Sstran30.ocx
- unzip32.dll
- Asycfilt.dll
- Cmdlgde.dll
- Comcat.dll
- Comdlg32.ocx
- flxgdde.dll
- mfc42.dll
- mscc2de.dll
- mscmcde.dll
- mscomct2.ocx
- mscomctl.ocx
- mscomde.dll
- mscomm32.ocx
- msflxgrd.ocx
- msmapi32.ocx
- msmpide.dll
- msvbvm60.dll
- msvcrt.dll
- oleaut32.dll
- olepro32.dll
- stdole2.tlb
- tabctde.dll
- tabctl32.ocx
- Vb6de.dll

6.4 Generated files

When ACS400 is started for the first time, a data directory will be generated below the ACS400 program directory (C:\Program Files\ACS400).



7 Handling and storage

7.1 Handling the CD

- Do not expose the CD to direct solar radiation or other UVA / UVB radiation
- Avoid excessive temperatures, humidity, dust, shocks, dirt, scratches, etc.
- Clean the CD only with a suitable cleansing agent using a dry, soft and fluff-free cloth
- If not is use, keep the CD in the plastic box

8 Hardware installation / deinstallation

8.1 Warning notes

Danger

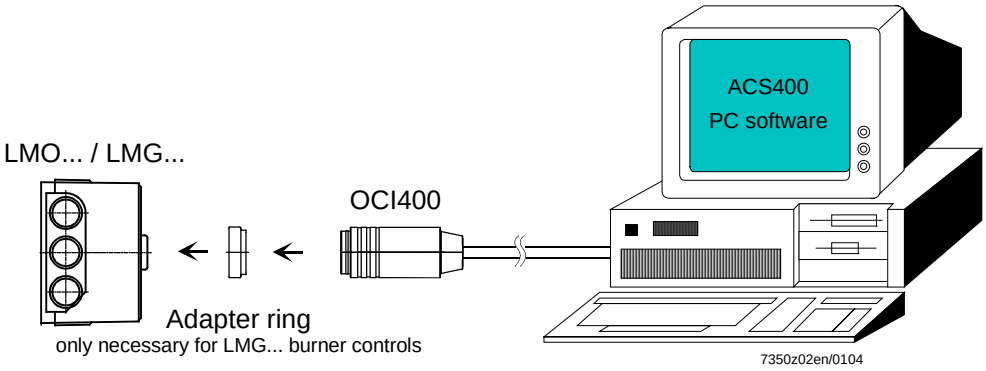
- Before performing any wiring changes in the connection area, completely isolate the equipment from the mains supply (all-polar disconnection)
- Take appropriate measures to provide protection against electrical shock hazard
- Press the burner control´s reset button / operating button manually (applying a force of no more than 10 N), without using any tools or pointed objects

8.2 Mounting notes

☞ **Ensure that the relevant national safety regulations are complied with.**

8.2.1 Setup with OCI400

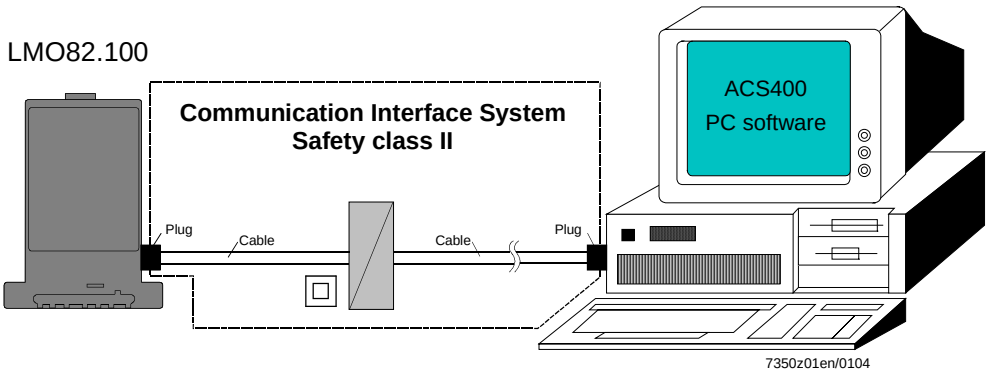
Connect the optoelectronic communication interface OCI400 for communication with all types of LMO… and LMG… burner controls, made by Siemens HVAC Products, to your computer's RS-232 (COM) port as shown below without using any extension cable (⇨ according to **Data Sheet N7614**).



8.2.2 Setup with other optional communication interfaces

Warning

The communication interface must be suited for use with burner controls that only have TTL levels (RxD, TxD) as a "4-wire eBus connection facility" on the hardware side.
For this reason, always use communication interface systems that conform to safety class II.
Before installing or removing this type of interface, make certain you read the supplier's instructions and warning notes (⇨ refer to **8.1**).



9 Starting the program

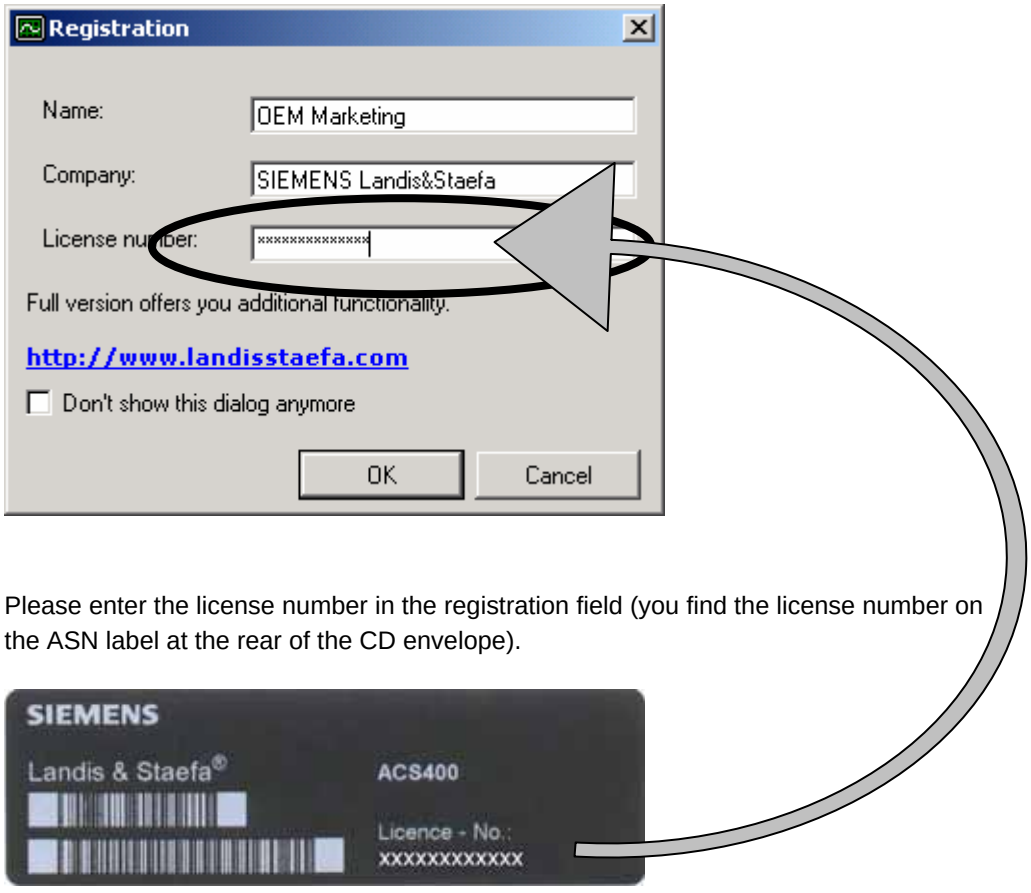
Connect the burner control via the OCI400 interface or an optional interface module for eBus or LPB light communication to your PC.
To start the software program, click the ***ACS*** icon on the Desktop or select ***ACS*** from the Windows start menu under ***Programs***.

Starting the program for the first time

After starting the program for the first time, you can enter the license number.
Only then will the tool work with its full scope of functions.

If you work without a license number, the scope of software functions will be restricted: No triggering in the case of events, no language variants, no updating choices, no storage and no printing of data.

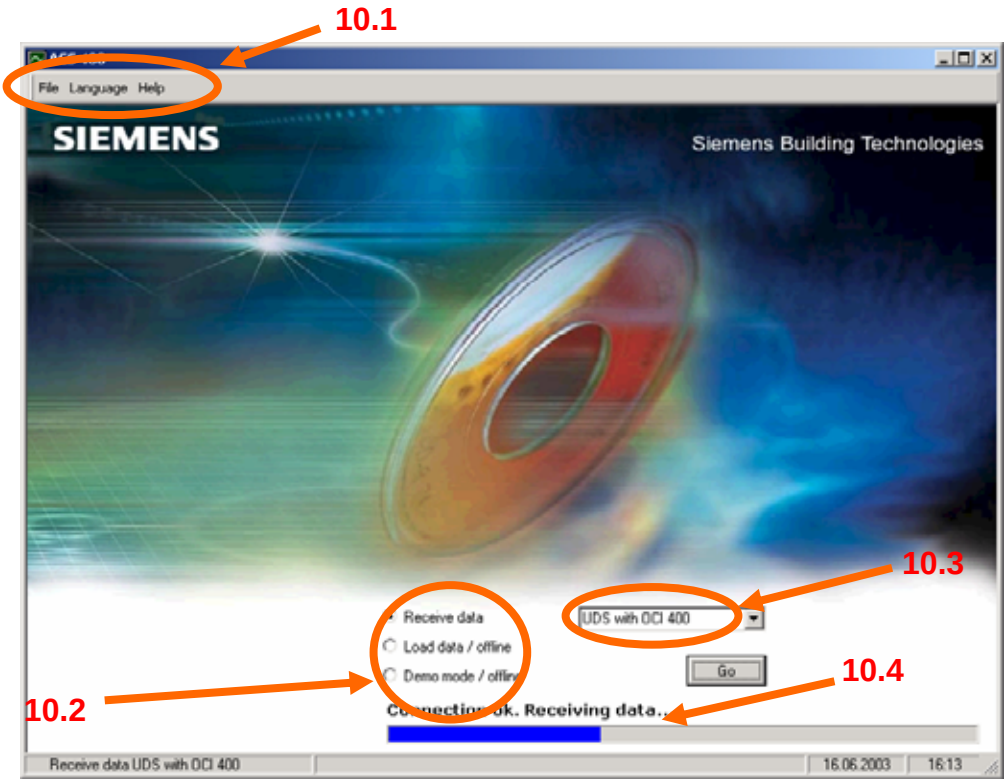
To make use of all the functions afterwards, select ***Help*** from the start screen and then ***Registration***.



Please enter the license number in the registration field (you find the license number on the ASN label at the rear of the CD envelope).

After registration, you can make full use of the tool.

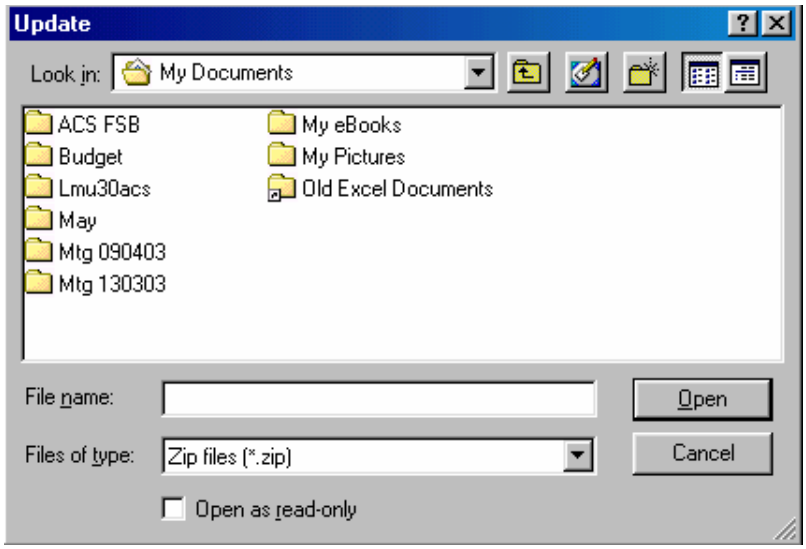
10 Start screen



10.1 ACS menu bar on the start screen

File

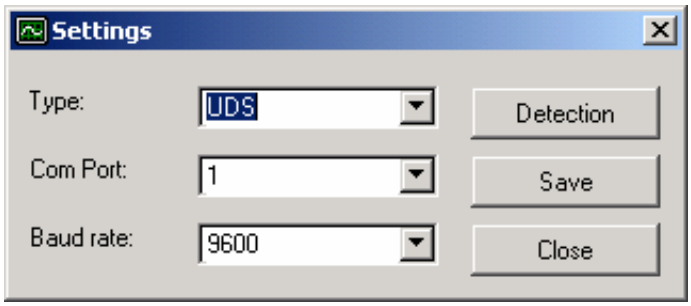
Load Update



Here, you can integrate into the ACS400 new program extensions that you receive as a ZIP file.
For that, click the relevant file. Select ***Open*** and the file will automatically be integrated.

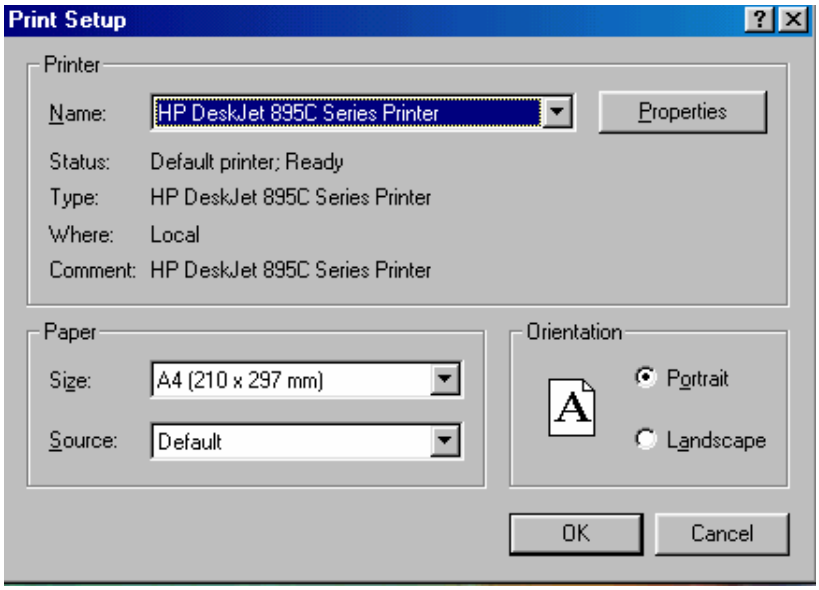
Cont'd
10.1 ACS menu bar on the start screen

Settings



The standard type of connection used is UDS protocol. COM Port 1, and the standard Baud rate is 9600.
If you have connected the communication modules to other COM ports, or if you require other types of connection, select the required type of connection and start the automatic port and Baud rate identification.
Save your settings. They will automatically be adopted next time the program is started.

Printer



Print — When selecting the ***Print*** command, the current program picture will be output on the selected printer.

Exit — You close the application by selecting the ***Exit*** command.

Language

Use this menu item to select one of the languages available for the ACS400 software package.

Cont'd
10.1 ACS menu bar on the start screen

Help

Registration	Possibility of software registration (license number required).
Info	Information about the ACS400 software package (version number, Internet page for update) and your PC system.
Help	Opening the online documentation on the ACS400 (Acrobat Reader required).

10.2 State

Receive data

When this menu item is selected, you can use the pop-up menu to choose from different communication reports (⇨ refer to **10.3**).

Load data / offline

Display and evaluation of recorded files or files that you have received via e-mail or data logging, for example. The data must conform to the ACS400 format. Connection to the burner control is not required.

Demo mode / offline

Display of a demo file. Connection to the burner control is not required.

10.3 Popup menu for type of connection

Choice of connections:

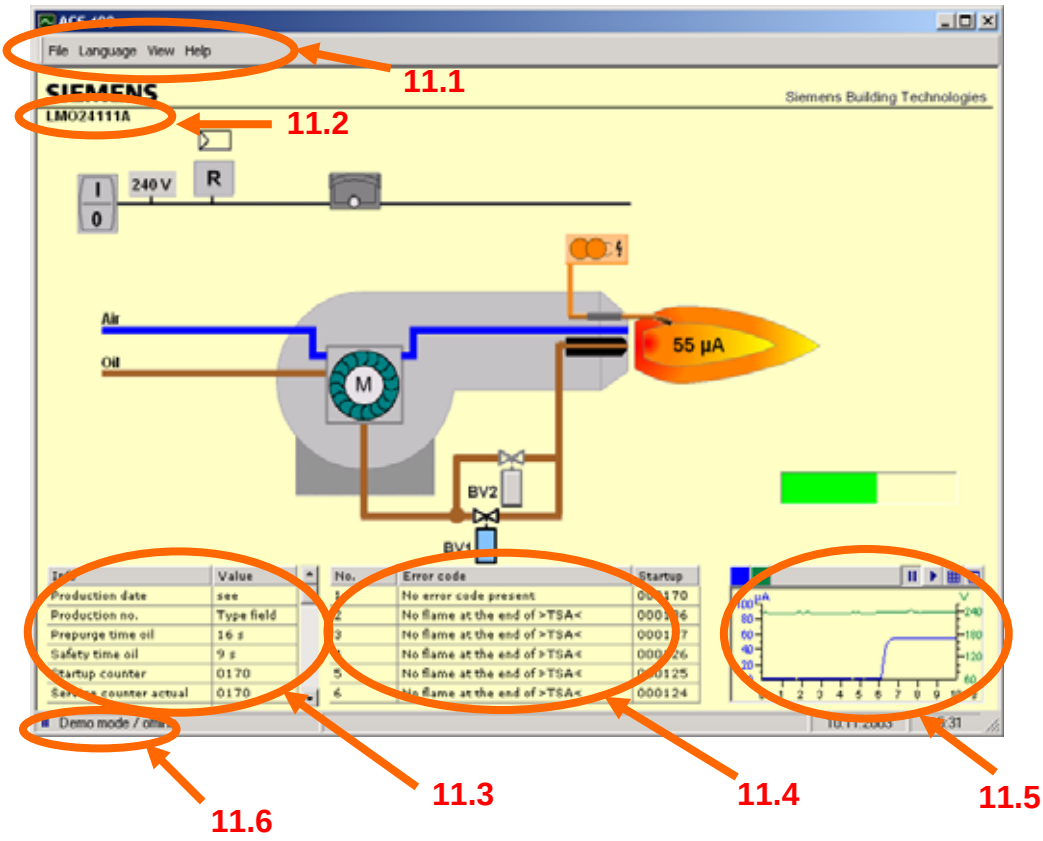
- **UDS with OCI400** (optical interface)
  for all types of LMO… burner controls.
  Sampling rate for trouble-free communication: Typically 150 ms, max. 170 ms
- **eBus with interface**
  for burner controls of the LMO… family with eBus. In the case, an adapter for connecting the eBus interface to the RS-232 PC interface is required.
  Sampling rate for trouble-free communication: Typically 1 s, max. 2 s depending on the data sequence.
- **LMG protocol with OCI400** (optical interface)
  for all types of LMG… burner controls. Data can only be delivered in the fault status position after requesting the blink code.
  Sampling rate for trouble-free communication: Typically 1 s, max. 1.2 s

10.4 State of connection

The connection shows you if there is communication with a burner control, or it shows the state of the connection. The bar moves until the type of burner control is identified. If the connection was successfully opened, the application of the relevant burner control will be indicated.

11 Application screen

This screen is dynamic and will be displayed in accordance with the identified application of the burner control.
The relevant outputs / inputs are displayed by highlighted symbols.



11.1 ACS menu bar on the application screen

File (⇨ refer to **10.1**)

Language (⇨ refer to **10.1**)

View Here, you can change between the application screen and the data logger view.

Help (⇨ refer to **10.1**)

11.2 Identification of type of burner control

“The normal type” reference of the detected type of burner control will be shown here.

11.3 Info table

The info table contains all specific data that the identified type of burner control transmits to the program.

11.4 Error code table

The last 5 or 10 errors (depending on the type of burner control) from the burner control's error storage will be read out and displayed.

11.5 Flame signal / mains voltage graph

This display shows the flame current and the mains voltage as an analog value over the last 10 seconds.
You can enlarge or reduce the presentation with the relevant button and also stop it for a short moment to have a closer look at it.


Flame current and mains voltage display are stopped, but data are still transmitted in the background


Flame current and mains voltage are continued to be displayed


Laying a grid on the display.


Enlarging the display


Reducing the display

11.6 State

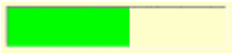
Shows you the current mode of the program.

Choice of modes:

- Receive data UDS with OCI400
- Receive data eBus with interface
- Receive data LMG... protocol with OCI400
- Load data / offline
- Demo mode / offline

11.7 Flame indication

Flame current is indicated in µA.

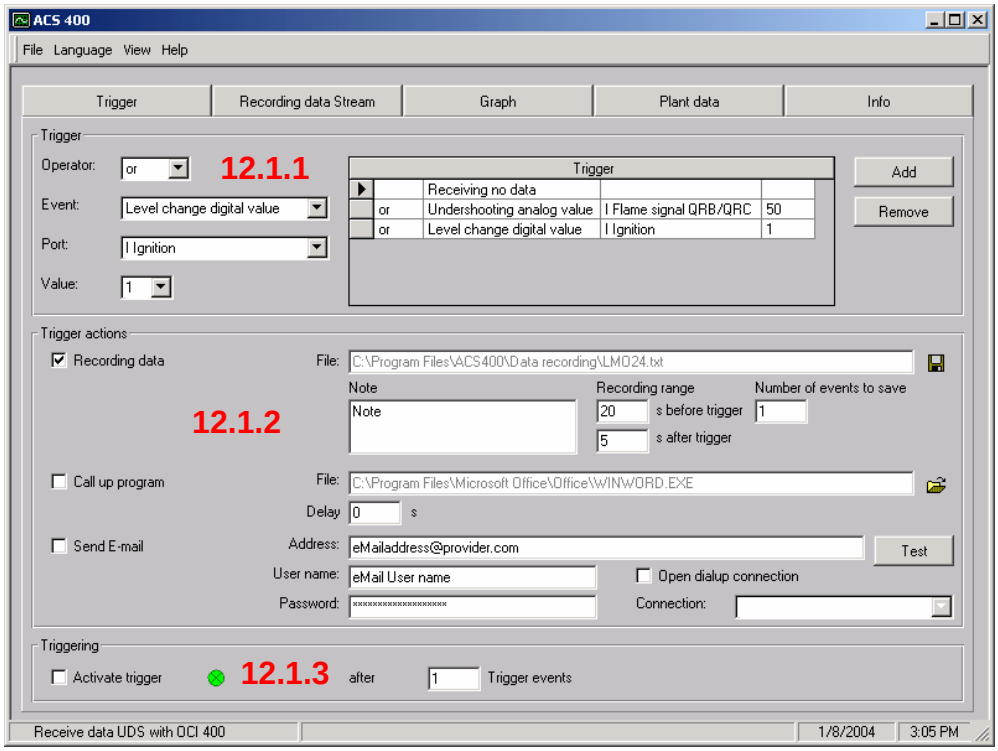


The indication is proportional to the flame signal and is system specific.

12 Data logger

Selection (⇨ also refer to **11.1** View) between application screen and data logger view.

12.1 Register card “Trigger”



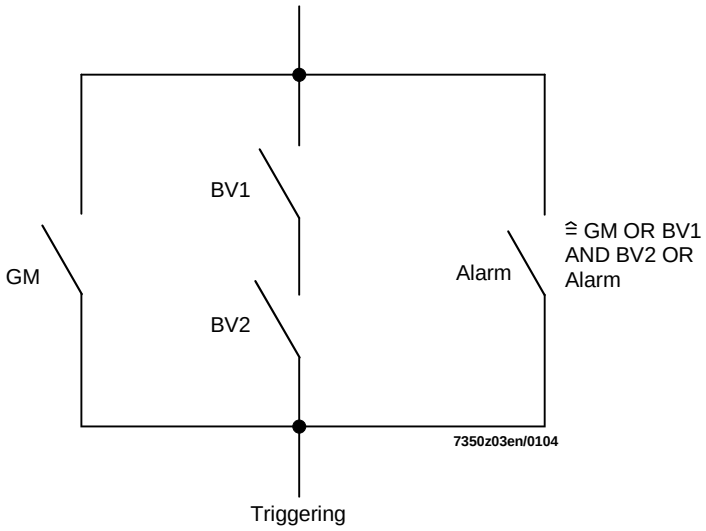
This function is used to log burner control data with selected events.

12.1.1 Trigger

On this picture, you can select one or several interlinked trigger events with which different actions can be triggered.

Operator: If you select several trigger events, you can link them by a logic AND or logic OR
If you define more than one trigger signal, you can interconnect the signals via the operator. The individual trigger events must always be connected with a logic AND (both criteria must be satisfied) or logic OR (1 of the 2 criteria must be satisfied). Note that the logic AND is given priority over the logic OR.

Example:



Event:
- No data reception (in the event of a communication breakdown)
- Exceeding or undershooting of analog value
- Level change of digital value

Port: Selection of all relevant input and output signals (depending on the type of burner control and event)

Value: Display of trigger values (any analog value or 0/1 digital value)

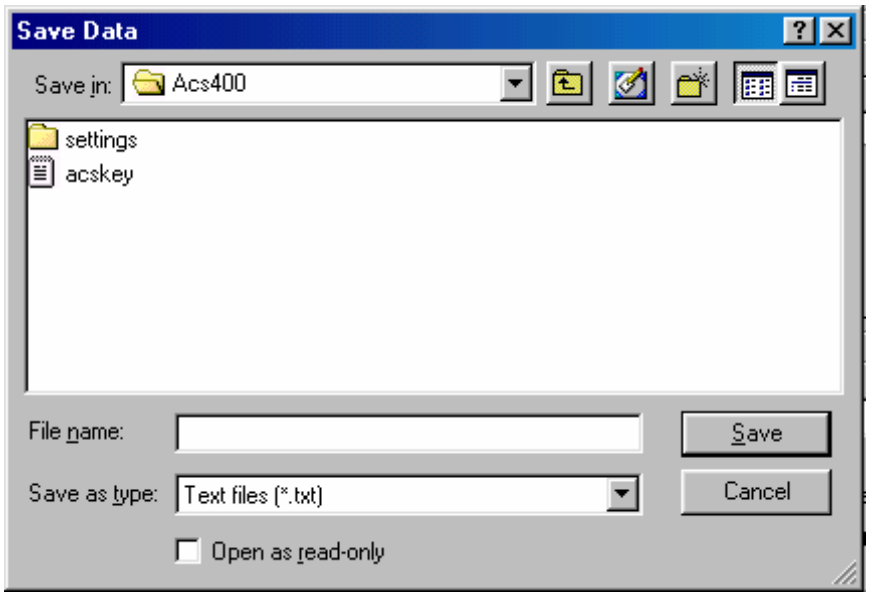
Click ***Add*** to include in the trigger table.

You can delete the set triggers by selecting ***Remove***.

12.1.2Trigger actions

Recording the file: The burner control's data are saved when indicating the path.

☞ File:  Create your own directory here where you would like to save the data. Do not save any files in the Demo folder.



Notes: Field for entering text that shall be saved together with your recording. By entering text, it will be easier for you to identify and administer your recordings at a later data.

Recording range: Indication of required period of time before or after the trigger event that shall be recorded.

Number of events to save: Here, you can indicate whether, based on subsequent trigger events, a recording shall be started once or several times.

Call up program: Here too, the file Browser can be opened and every file (.exe) that can be executed can be started with a trigger event.

File:  Here, you can open the path where the required program file is filed.

Delay: Indication of delay time for the program call to be triggered.

Cont'd
12.1.2 Trigger actions

Send E-mail:

Preconditions: MAPI-compatible e-mail client such as Outlook Express 5.0 (component of Internet Explorer 5.0 and running under Win98, WinNT 4.0, Win2000, WinMe, and WinXP) must be installed!
Access to the Internet via a data network; analog modem; GSM; ISDN or DSL modem and a provider that supports e-mail functions must be installed in your operating system. For details, contact your system administrator.

☞ Please note that use of this function generates additional communication costs. Also check your modem settings (e.g. shutdown when not in use).

Address: Entry of recipient's e-mail address.

User name: User name of your selected connection or name of user in e-mail profile in the case of a LAN connection.

Password: Entry of the associated password.

Open dialup connection: Sending e-mail via a DFÜ connection (analog modem, GSM, ISDN or DSL modem).

☞ Do not dial in case a LAN connection exists.

Connection: Selection of all DFÜ connections available on your system.

Test: You can use this button to check your e-mail connection and send an e-mail at the same time.

☞ Data from the burner control cannot be received during the time an e-mail is sent. The relevant error message appears during that period of time. Then, data reception will be resumed.

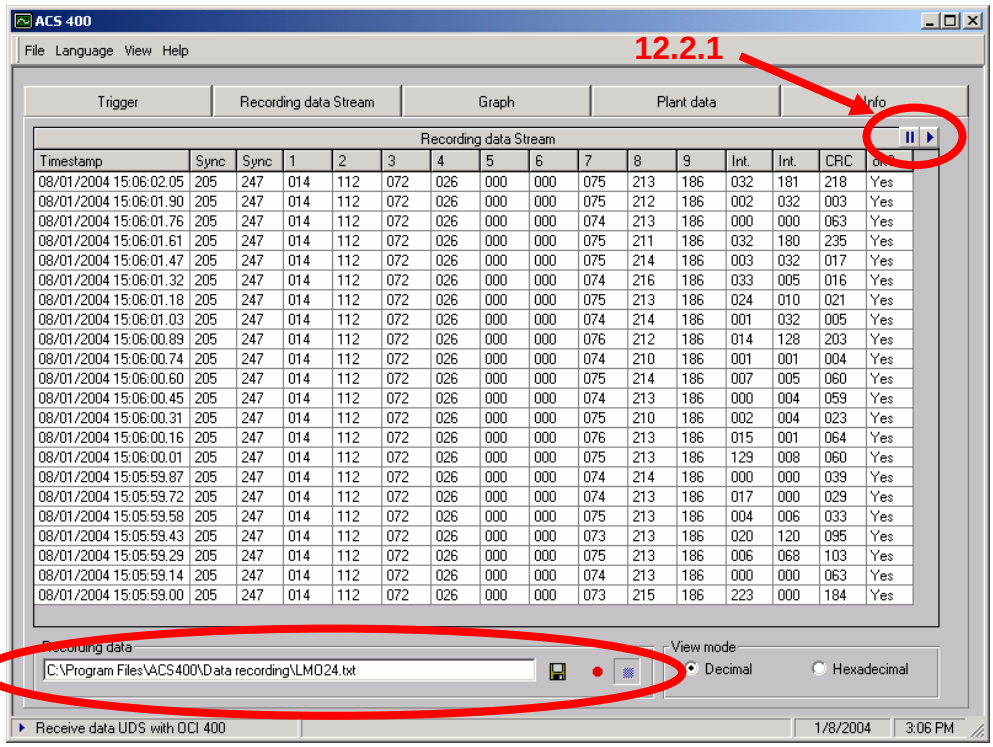
12.1.3 Triggering

Activate trigger: Triggering will be activated with the next trigger event.

Trigger active indication: This green indication appears when triggering is being processed. Data from the burner control can still be received.

after: Number of trigger events until the trigger action takes place.

12.2 Register card “Data Stream”



This screen shows you the data stream delivers to the PC by the burner control.

12.2.1 Function “Replay / Pause”

Data stream display is stopped, whereby the data continue to be transmitted in the background.

Data stream display is continued from the current point in time.

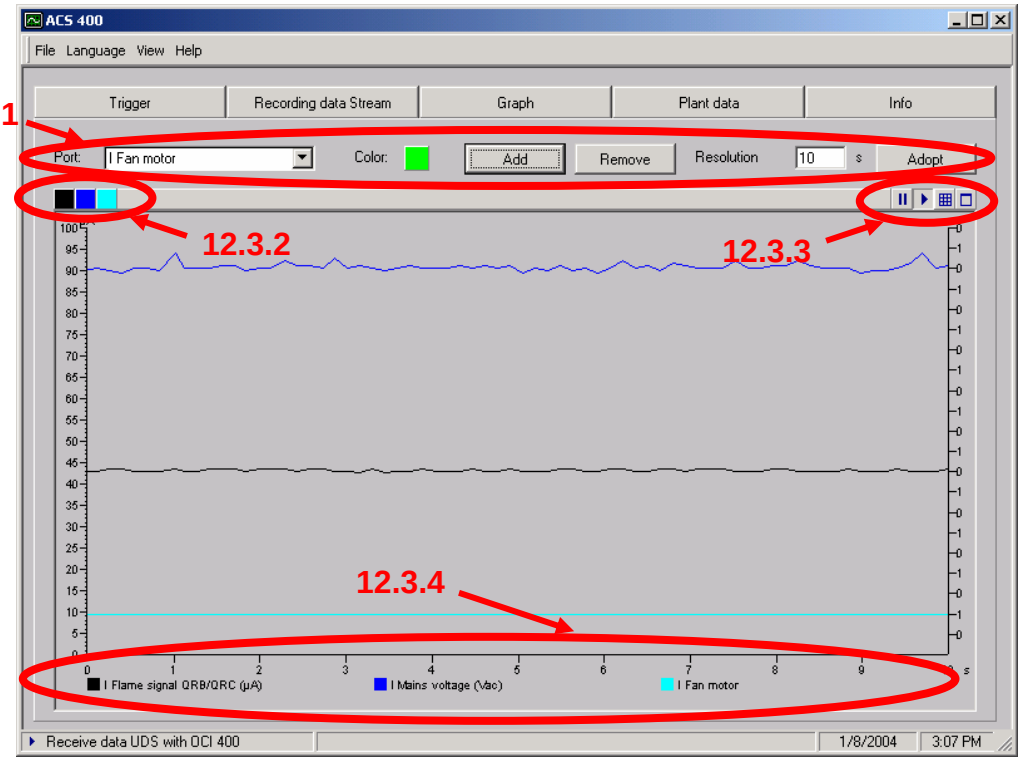
12.2.2 Logging the data stream

Create your own directory here where you would like to save the data. Do not save any files in the Demo folder. (⇨ also refer to **12.1.2** *Recording the file*).

Start logging.

Stop logging.

12.3 Register card “Graph”



12.3.1 Selecting the displayed data

Port: Burner control-dependent selection of all input or output signals, such as flame signal or mains voltage that can be shown on the graph screen.

Color: Selection of color for the chosen port.

Add: Adding the selected port to the display. A maximum of 10 input or output values can be displayed.

Remove: Removing a port from the display (⇨ also refer to **12.3.2**).

Display range: Indication of the required scope of display on the time axis. The maximum display range comprises 86,400 seconds (24 hours).

Adopt: Adoption of display range by the graph.

12.3.2 Selecting a port

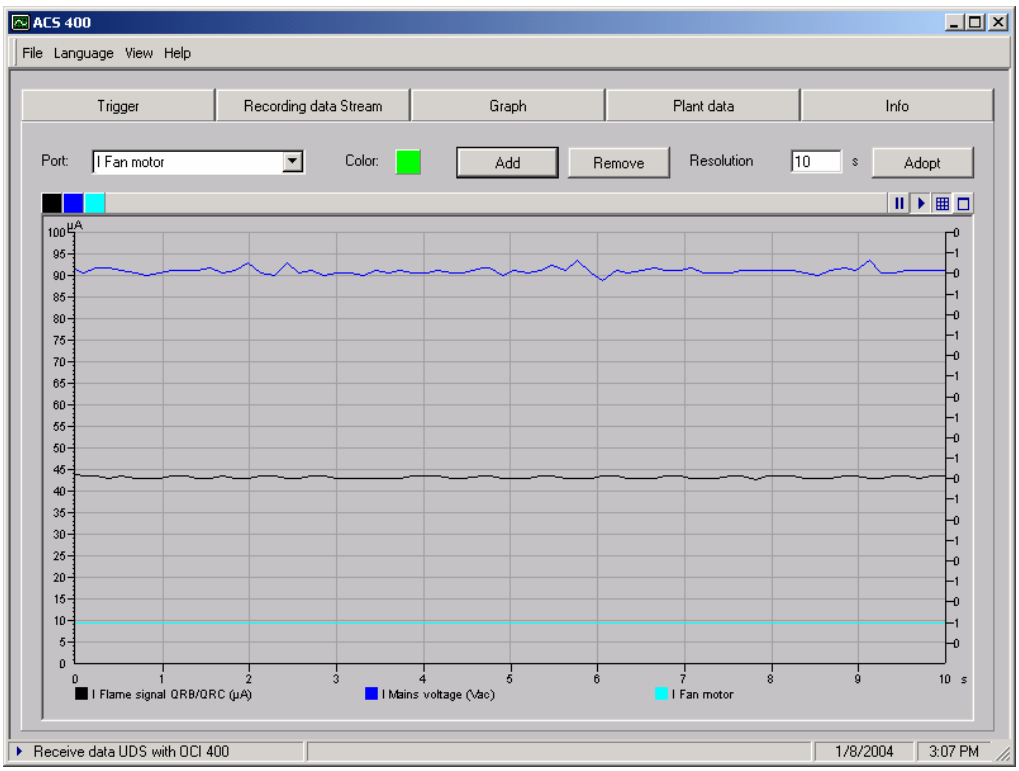
Selection - ... for displaying the ports and their scaling.
- ... for removing the ports (⇨ refer to **12.3.1**).

12.3.3 Operating the display

Graph display is stopped, whereby the data continue to be transmitted in the background.

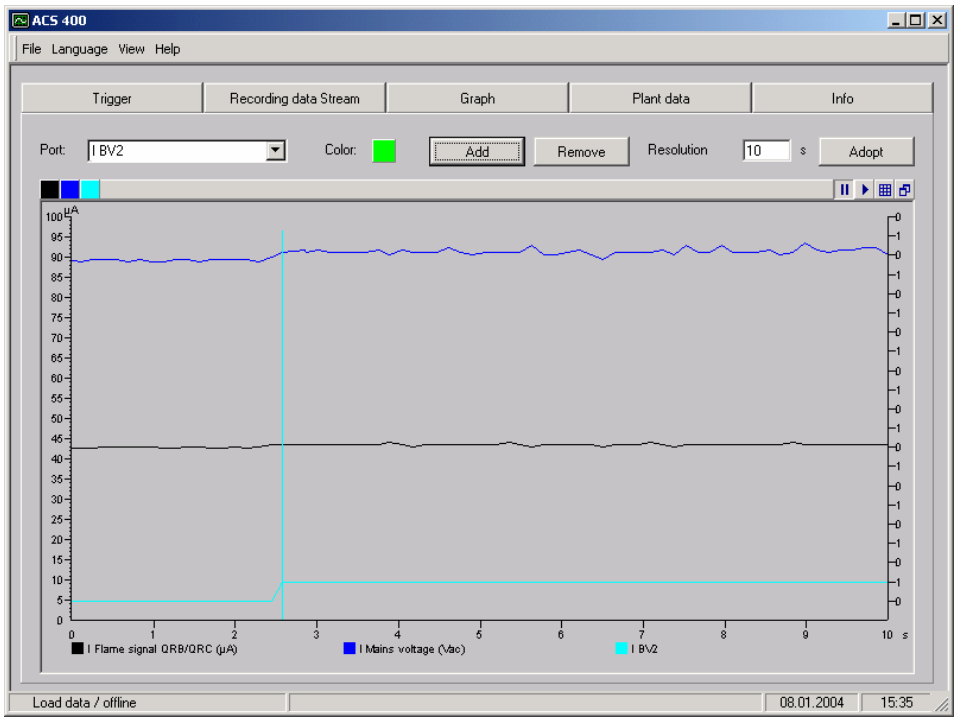
Graph display of data is continued with the current value.

Laying a grid on the display.



☞ Due to the software sampling rate, the oscillograph display is not suited for accurate time measurements (⇨ refer to **10.3**).

12.3.4 Display of a trigger recording



The vertical line indicates the point in time the trigger event occurred.

12.3.5 Port table

Legend of selectable ports (depending on the type of burner control):

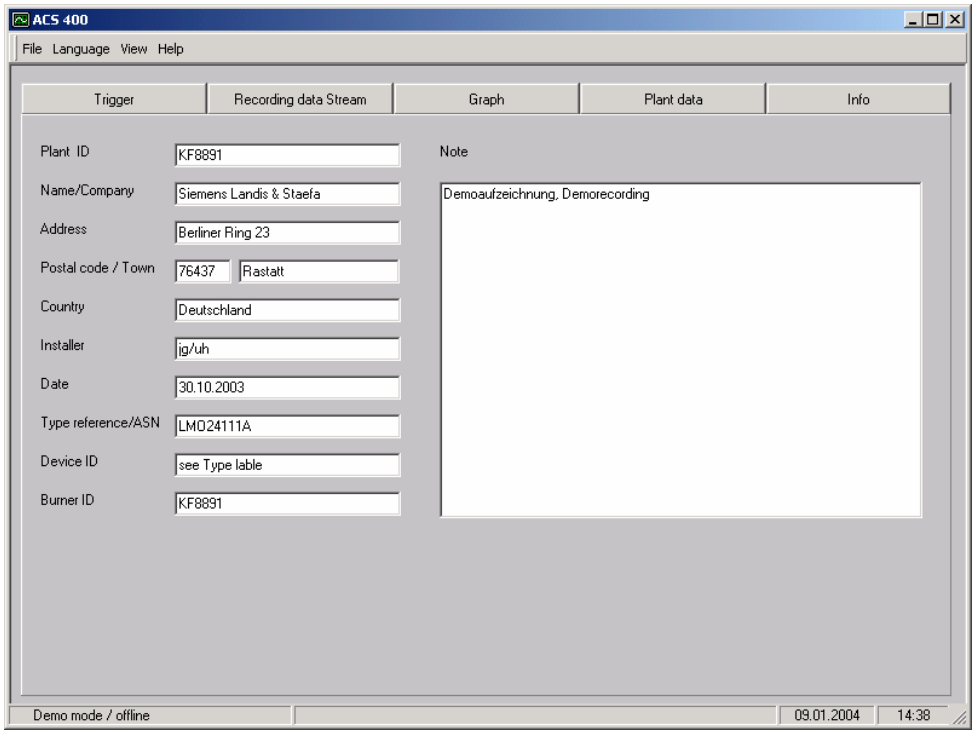
I Flame signal ION (analog) ± 5 %
I Flame signal ION (digital)
I Flame signal QRB/QRC (analog) ± 5 %
I Flame signal QRB/QRC (digital)
I Mains voltage (analog) ± 5 %
I Mains voltage (digital)
I Oil preheater temperature (analog) ± 5 %
I Oil preheater temperature (digital)
I Fan motor
I Ignition
I SBV
I BV1
I BV2
I BVZ
I Oil preheater
I BV3
I Pump
I Flue gas supervision
I Release contact of oil preheater
I Air damper actuator

Cont'd
12.3.5 Port table

I Reset
I Remote reset
I LP
I GP
I Thermostat
I Load control
I Fuel selection
I Actuator cam position ZU
I Actuator cam position KL
I Actuator cam position ZL
I Actuator cam position BV2
I Actuator cam position GL
I Flow switch
I STB
I Summer / winter switch
O Alarm lamp

12.4 Register card "Plant data"

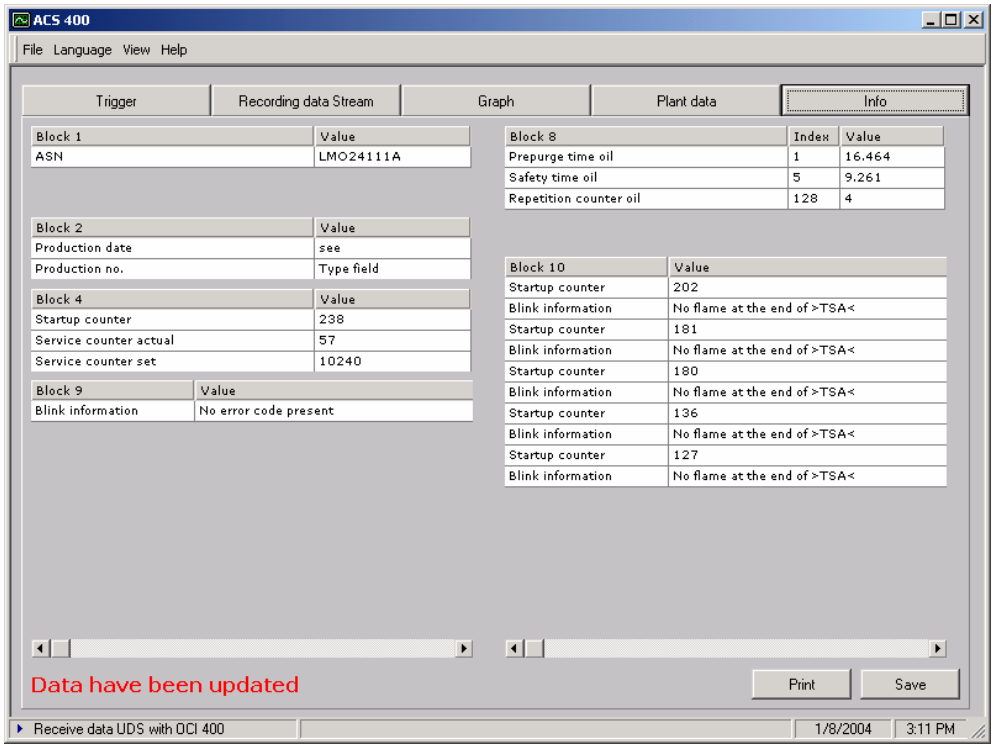
On this screen, if required, plant-specific data can be entered, which can be saved together with the data sets, such as a trigger event, data stream recording, or an info table.
Based on the data, administration of recordings with collected information can be simplified.



When displaying recorded data sets, your entries will be shown.

12.5 Register card “Info”

This screen shows all relevant data of the burner control.



Block 1: Identification / type reference of burner control, e.g. LMO24.111.A2.

Block 2: Production date and number, provided the burner control transmits these data.

Block 4: Start up counter: Number of startups
Service counter actual: Reading since the last service visit
Service counter set: Possible service counter intervals

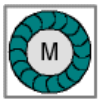
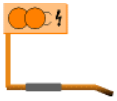
Block 8: Burner control-specific parameter, such as waiting and safety time.

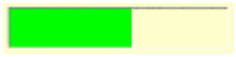
Block 9: Current lockout information.

Block 10: Fault history of the last 5 or 10 fault status signals in clear text with the relevant startup counter readings.

When all blocks have been updated, the message “Data have been updated“ will appear.

13 Legend of symbols

	Mains ON / OFF
	Mains voltage display (± 5 %)
	Demand for heat from the controller
	Load controller
	Air pressure switch
	Gas pressure switch
	Actuator for air
	Actuator for gas
	Closed Position Indicator
	Fuel valve
	Fan motor
	Air / gas damper
	Oil preheater
	Ignition
	Flame current is indicated in µA (± 5 %)



The indication is proportional to the flame signal and is system specific.

Signal lamp input / output on (active)

Alarm / warning lamp

Flame bar with indication of flame current (± 5 %)

Display of data is stopped, whereby the data continue to be transmitted in the background

Display of data is continued

File is opened

File is saved

Start data logging

Stop data logging

Display of grid

Safety class II [1)]

[1)] Communication interface systems that offer safety class II are systems, where protection against electric shock hazard is ensured not only by the basic insulation, but also by additional protective measures, such as double or reinforced insulation.

14 Glossary

BSB	**B**oiler **S**ystem **B**us
DFÜ	**D**aten**f**ern**ü**bertragung – data exchange via the Telefone line (Internet) over long distances
Data logger	Program section used for displaying and recording the burner control´s activities
DSL	**D**igital **S**ubscriber **L**ine
eBus	Serial 2-wire bus for communication between heating system devices
GSM	**G**lobal **S**ystem for **M**obile Communications
ISDN	**I**ntegrated **S**ervices **D**igital **N**etwork
LAN	**L**ocal **A**rea **N**etwork
LMG	Modern, microprocessor-based burner control made by Siemens HVAC Products for use with gas burner
LMO	Modern, microprocessor-based burner control made by Siemens HVAC Products
MAPI	**M**essaging **A**pplication **P**rogramming **I**nterface – defined interface used for sending e-mails from the Windows software
OCI400	Optoelectronic interface module used for communication with all types of LMO… and LMG… burner controls made by Siemens HVAC Products
UDS	**U**n**d**irektionale **S**chnittstelle - unidirectional interface
USB	**U**niversal **S**erial **B**us

15 Error handling

Error	Troubleshooting
The display bars fort he connection state do not change when receiving data. Message: "*Check connection*" and "*Receiving no readable data*".	Check to see whether the correct type of connection has been selected (⇨ refer to **10.3** Popup menu for type of connection). Check if the burner control is in communication mode (⇨ refer to the documentation of the relevant burner control or burner). Check to see if the communication interface has been correctly connected (⇨ also refer to the documentation of the communication interface). Check the interface settings (⇨ refer to **10.1** ACS menu bar on the start screen).
The following Windows error message appears: *"ACS400.exe has generated errors and will be closed by Windows. You will need to restart the program. An error log is being created."*	To ensure trouble-free operation of the program, the computer must be restarted. If this is not observed, data recording may stop next time the program is started or the "Close window" function will not be correctly performed.
Automatic interface identification cannot identify the type of burner control.	1. Check to see if the communication module is connected to the computer (e.g. 1 for COM 1). 2. From the "File / Settings" menu, select the COM port required by you (e.g. 1 for COM 1). 3. Save your settings. 4. Start data reception.
Display of oscillograph stops from time to time	Data logging requires more processing capacity! Reduce the number of graphs to be displayed or close the parallel running software applications not required.
Data reception and saving is impaired or faulty	Check to see if a virus scanner is active. If yes, deactivate it. Do not use ACS400 simultaneously with a virus scanner!

15.1 Avoiding misinterpretations on the display

Display	Interpretation
Digital flame signal “1“ on the oscillograph on startup or shutdown	Certain types of burner control perform a flame signal amplifier test after startup or shutdown. Response: The oscillograph shows a digital flame signal “1“ for a short time (for about 2 seconds). This does not necessarily mean that a flame is present. The flame can only be assessed via the analog flame signal.
Digital flame signal “1“ on the oscillograph when burner control has gone to lockout	With certain types of burner control, the flame signal amplifier is set more sensitive in the event of power failures in the lockout position. Response: The oscillograph shows a digital flame signal “1“. This does not necessarily mean that a flame is present. The flame can only be assessed via the analog flame signal.
Extensive ramp response and decay times of the signals in the oscillograph	During the communication pauses, the points sampled are connected. The actual value of the signal cannot be displayed

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Siemens Building Technologies
Landis & Staefa Produktion GmbH
Berliner Ring 23
76437 Rastatt
Tel: +49 7222 598 0
Fax: +49 7222 53182
www.landisstaefa.com/rastatt