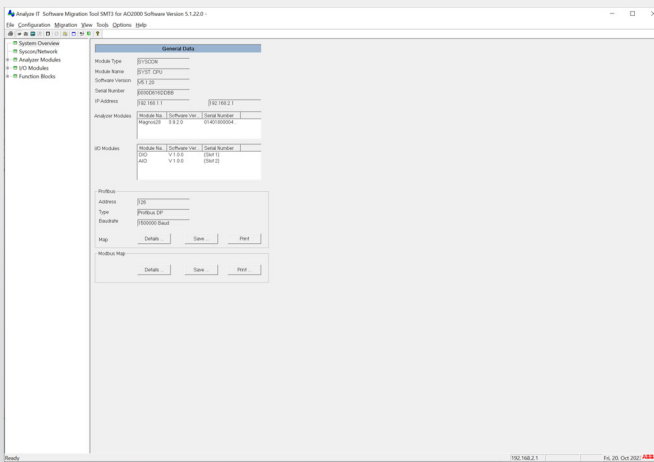


# SMT

## Software Migration Tool

Software-Version 5.1

Measurement made easy



## Table of contents

<b>1</b>	<b>Safety .....</b>	<b>3</b>
	General information and notes for the reader.....	3
	Warnings .....	3
	Intended use.....	3
	Target groups and qualifications.....	3
	Warranty provisions.....	3
	Cyber security disclaimer.....	4
	Software downloads.....	4
	Manufacturer's address .....	4
	Service address.....	4
<b>2</b>	<b>General description .....</b>	<b>5</b>
	Application.....	5
	Communications .....	5
	Language .....	5
<b>3</b>	<b>Installation .....</b>	<b>5</b>
	System requirements .....	5
	Install SMT .....	5
	Setting TCP/IP Parameters in AO2000 .....	6
	Setting TCP/IP-Parameters in the PC.....	6
	Ethernet connection .....	7
<b>4</b>	<b>Operation.....</b>	<b>8</b>
	Configure SMT .....	8
	Perform Update.....	9
	Update from Software Version 2.0 to Software Version 5.1 .....	10
	Update from Software Version 3.0/4.0/5.0 to Software Version 5.1.....	11
	Replace the Serial Number in a Configuration File.....	12
	Load a Text File.....	13
	Output Log Contents.....	14
	System Overview .....	15

# 1 Safety

## General information and notes for the reader

Read these instructions carefully prior to installation and use. These instructions are an important part of the product and must be kept for future reference.

These instructions are intended as an overview and do not contain detailed information on all designs for this product or every possible aspect of use.

For additional information or if specific problems occur that are not discussed in these instructions, contact the manufacturer.

The content of these instructions is neither part of any previous or existing agreement, promise or legal relationship nor is it intended to change the same.

Following the instructions is an essential prerequisite for safe and fault-free operation of the product.

## Warnings

The warnings in these instructions are structured as follows:

### **DANGER**

The signal word '**DANGER**' indicates an imminent danger. Failure to observe this information will result in death or severe injury.

### **WARNING**

The signal word '**WARNING**' indicates an imminent danger. Failure to observe this information may result in death or severe injury.

### **CAUTION**

The signal word '**CAUTION**' indicates an imminent danger. Failure to observe this information may result in minor or moderate injury.

### **NOTICE**

The signal word '**NOTICE**' indicates possible material damage.

## Note

'**Note**' indicates useful or important information about the product.

## Intended use

The software migration tool SMT is intended for:

- updating the system software
- backing up the AO2000 gas analyzer configuration files

## Target groups and qualifications

Only trained specialist personnel who have been authorized by the plant operator accordingly are permitted to install and use the product. The specialist personnel must have read and understood the manual and must comply with its instructions.

## Warranty provisions

Using the device in a manner that does not fall within the scope of its intended use, disregarding this manual, using underqualified personnel, or making unauthorized alterations releases the manufacturer from liability for any resulting damage. This renders the manufacturer's warranty null and void.

## ... 1 Safety

### Cyber security disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is operator's sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be).

Operator shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

### Software downloads

By visiting the web page indicated below, you will find notifications about newly found software vulnerabilities and options to download the latest software. It is recommended that you visit this web page regularly:

[www.abb.com/cybersecurity](http://www.abb.com/cybersecurity)

### Manufacturer's address

#### ABB AG

#### Measurement & Analytics

Stierstädter Str. 5  
60488 Frankfurt am Main  
Germany

Tel: +49 69 7930-4666

Email: [cga@de.abb.com](mailto:cga@de.abb.com)

### Service address

If the information in this User manual does not cover a particular situation, ABB Service will be pleased to supply additional information as required.

Please contact your local service representative.

#### Customer service center

Tel: +49 180 5 222 580

Email: [automation.service@de.abb.com](mailto:automation.service@de.abb.com)

## 2 General description

### Application

Software Migration Tool SMT is intended for the following applications of AO2000 series gas analyzers:

- to update the system software
- to archive the configuration file

#### **NOTE**

##### **Damage to the configuration of the gas analyzer**

In case of improper operation, there is a risk that the configuration of the gas analyzer will be damaged or destroyed.

- It is strongly recommended to read this manual thoroughly.

### Functionality

SMT has the following range of functions:

- Software update
- Configuration file
  - Save (Backup)
  - Replace Serial Number
  - Load
- System overview
  - Display, Print and Save (Backup)
  - Tree View
  - Function Block Navigation
- Log Content Backup
- Load a text file for user interface

### Communications

An Ethernet connection (peer-to-peer or network) is used for communication with the AO2000 central unit (see **Setting TCP/IP Parameters in AO2000** on page 6).

### Language

SMT is only available in an English language version.

## 3 Installation

### System requirements

- Windows 7, 8.1 oder 10 operating system
- Minimum of 16 MB free memory (RAM)
- Minimum of 10 MB free hard disk space
- Ethernet interface
- Ethernet connection with TCP/IP protocol

#### **Note**

All documentation, declarations of conformity, and certificates are available in ABB's download area.

[www.abb.com/analytical](http://www.abb.com/analytical)

**For further information on downloading, please refer to the supplementary sheet enclosed with the device or contact ABB Service!**

### Install SMT

1. Uninstall Other Program Versions: Before installing SMT, uninstall the old program version.
2. Download zip file from the website and unzip it to a local folder on your hard drive.
3. Start file "ao\_smt3\_F(version number)P(version number).exe".
4. Follow the instructions of the installation program.  
**Note:** Accept the recommendation of the installation program for the name of the folder in which SMT shall be installed. All software tools are installed in this folder by default.

## ... 3 Installation

### Setting TCP/IP Parameters in AO2000

The TCP/IP parameters in AO2000 have to be checked and changed if necessary for proper operation of SMT.

#### Menu Path

'MENU / Configure / System / Network / TCP/IP Network'

#### Point-to-Point Connection

The IP address of AO2000 is factory-set to 192.168.1.1. When using a point-to-point connection the IP address in AO2000 must be harmonized with the setting in the PC (see **Setting TCP/IP-Parameters in the PC**).

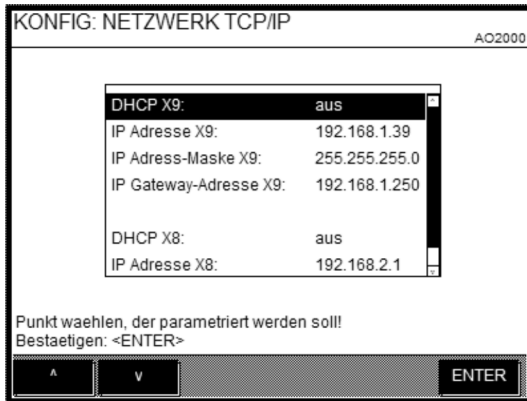


Figure 1: Network configuration in the gas analyzer

#### Network Connection

Both Ethernet 10/100/1000BASE-T interfaces can be used to link the gas analyzer to an Ethernet network (with TCP/IP protocol). The first Ethernet interface is referred to as X9 and the second one as X8.

#### Parameters

It depends on the DHCP settings what parameters need to be integrated:

DHCP setting	Parameter
DHCP on	Network name (max. 20 characters, no empty and special characters),
DHCP off	IP address, IP address mask and IP gateway address

#### Addresses

The IP address, IP address screen and IP gateway address need to be queried from the system administrator.

#### Note

- Addresses of TCP/IP categories D and E are not supported.
- The address bits variable from the address screen may not be set to 0 or 1 (broadcast addresses).

### Setting TCP/IP-Parameters in the PC

#### Point-to-point connection

When using a point-to-point connection enter the IP address and subnet mask in the Internet Protocol Properties according to **Figure 2**.

The IP address of AO2000 is factory-set to 192.168.1.1 (see **Setting TCP/IP Parameters in AO2000**).

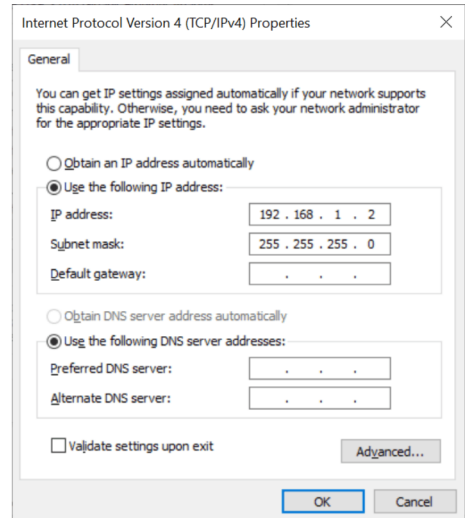


Figure 2: TCP/IP Properties for a Point-to-Point Connection

#### Network connection

When using a network connection ask the system administrator for the IP address, subnet mask and IP gateway address and enter these data likewise in the Internet Protocol Properties.

## Ethernet connection

### Versions and required cables

Version	Required Cable
Point-to-point connection:	Twisted-pair cable with RJ45 plugs, pin configuration: 1-3, 3-1, 2-6, 6-2
Connection via an Ethernet network:	Twisted-pair cable with RJ45 plugs

#### Note

Cables are standard Ethernet cables and are not delivered with SMT or AO2000.

### Test the Ethernet connection

In order to test the Ethernet connection enter "*ping IP address*" (where *IP address* is the IP address of AO2000) in "Start / Run...".

In case of a working connection the gas analyzer should prompt with "Reply from IP address: bytes=32 time<10ms TTL=255" (the numbers are device specific).

If you get the following prompt "Request timed out" the network connection is not working properly. Please consult your system administrator.

#### Note

The *network name* can be entered instead of the *IP address*.

## 4 Operation

### Configure SMT

#### Enter the Device Address

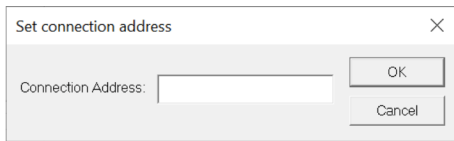


Figure 3: Enter the Device Address

Button:



Enter the gas analyzer's IP address or network name in the 'Configuration / Set connection address' menu (see auch **Setting TCP/IP Parameters in AO2000** on page 6).

The device address entered is displayed on the status line.

#### Set the Configuration File Name

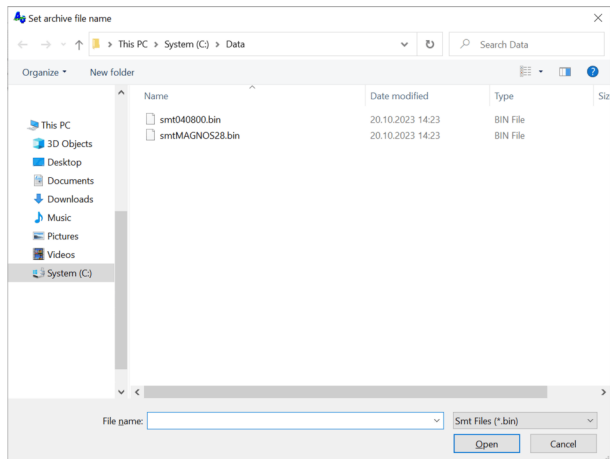


Figure 4: Set the Configuration File Name

Button:



Enter the directory and name for the configuration file in the 'Configuration / Set archive file name' menu.

The configuration file is saved as a binary file. The file extension '.bin' is added automatically.

The configuration file is accessed:

- When saving configuration data using the 'Migration / Save configuration data' menu, see **Perform Update** on page 9
- When loading configuration data using the following menus:
  - 'Migration / Load configuration data', see **Perform Update** on page 9
  - 'Tools / Replace serial number', see **Replace the Serial Number in a Configuration File** on page 12
  - 'Tools / Logbook list', see **Output Log Contents** on page 14.

The configuration file name is displayed on the status line.

#### Set the User Interface Language

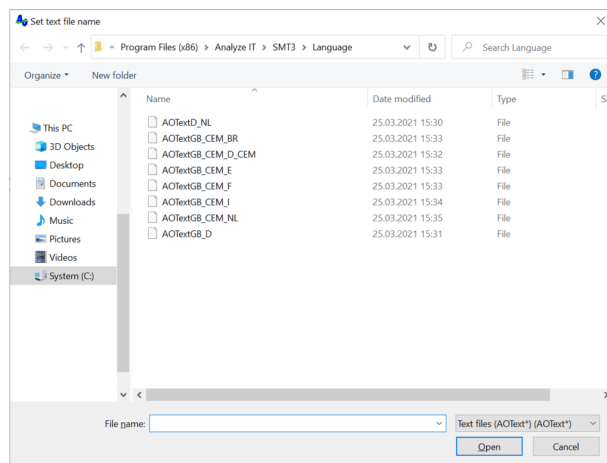


Figure 5: Set the User Interface Language

Button:



The 'Configuration / Set language file' menu is used to enter the name of the text file containing the two gas analyzer user interface languages that will be loaded in the gas analyzer when performing an update.

If no selection is made, the language combination loaded and the language selected on the gas analyzer will remain in effect.

The text file name is displayed on the status line.



## Available Language Combinations

Language Combination	File Name
German - Dutch	AOTextD_NL
English (CEM) - Portuguese	AOTextGB_CEM_BR
English (CEM) - German (CEM)	AOTextGB_CEM_D_CEM
English (CEM) - Spanish	AOTextGB_CEM_E
English (CEM) - French	AOTextGB_CEM_F
English (CEM) - Italian	AOTextGB_CEM_I
English (CEM) - Dutch	AOTextGB_CEM_NL
English - German	AOTextGB_D

### Note

To load a text file without updating the gas analyzer, use the 'Change language' tool, see **Load a Text File** on page 13.

### Status Line

The 'View / Statusbar' menu allows a status line at the lower edge of the screen to be displayed or hidden.

### Error List

The 'View / Errorlist' menu allows an error list to be displayed in the lower portion of the window or hidden.

## Perform Update

### Run update automatically

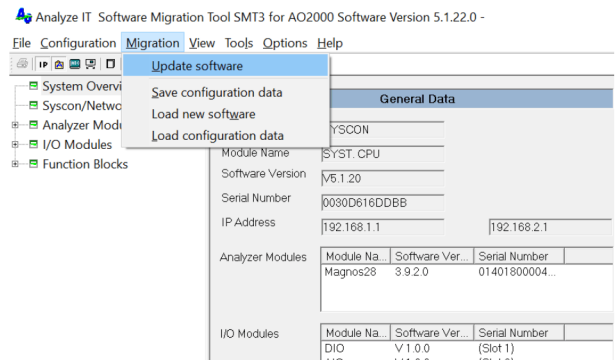


Figure 6: Perform Update

Button:



1. Select the 'Migration / Update software' menu.
2. Click the 'Yes' button in the dialog box that appears. The update will automatically run in three steps:
  - Saving configuration data from AO2000 in the file selected using the 'Configuration / Set archive file name' menu (see **Configure SMT** on page 8).
  - Booting AO2000, loading system software, rebooting.
  - Loading configuration data from the selected file into AO2000; saving the configuration in AO2000.

### Perform Step-by-Step Update

#### NOTICE

##### Risk of data loss

The 'Load new software' function overwrites the AO2000 configuration data.

- Save the configuration data before the update!

The update can also be performed in a step-by-step manner. Thereby the following sequence must be observed.

1. Saving configuration data ('Save configuration data').
2. Loading system software ('Load new software').
3. Loading and saving configuration data in AO2000 ('Load configuration data').

### Note

- After an update, check the AO2000 autocalibration parameters and time zone, date and clock values.

## ... 4 Operation

### Update from Software Version 2.0 to Software Version 5.1

#### Hardware Requirements

- Software version 5.1 can be installed only in a gas analyzer equipped with Syscon III.
- In a gas analyzer with Syscon III and software version 5.1
  - maximum 3 IO boards can be installed in slots X11 to X13;
  - at least 1 analog output module and 1 digital I/O module must be installed;
  - the number of analog I/O boards must be equal to or greater than before conversion and update;
  - the total number of digital I/O boards and modules must be greater than before conversion and update.
- I/O boards not used anymore in the gas analyzer with Syscon III and software version 5.0 must be deleted from the old gas analyzer (Syscon I, V 2.0) prior to conversion and update.
- If instead of the present I/O boards other I/O boards shall be installed in the gas analyzer after conversion to Syscon III, the serial numbers must be changed before the update (see **Replace the Serial Number in a Configuration File** on page 12).

#### I/O Boards and I/O Modules Default Assignment

- First, the analog I/O boards are assigned to slots X11 to X13.
- Subsequently, the digital I/O boards are assigned to further free slots.
- Surplus I/O boards are assigned to 'external' slots.
- Digital I/O modules can be assigned also to digital I/O boards.

#### Perform update

The update must be performed in a step-by-step manner.

1. 'Migration / Save configuration data':  
Save configuration data of (old) software version 2.0.
2. Convert gas analyzer from Syscon I to Syscon III.
3. 'Migration / Load new software':  
Load new software version 5.1.
4. 'Migration / Load configuration data':  
The 'I/O Module Assignment' dialog appears.  
In the 'I/O Boards' list (left) the Syscon I/O's and I/O boards as in the V 2.0 configuration file saved in step 1 are displayed.  
In the 'Assignment' list (middle) the (new) I/O modules and I/O boards on Syscon III (V 5.1) as assigned to the Syscon I/O's or old I/O boards by SMT are displayed. Modules assigned to each other are displayed in the same row.  
In the 'Available' list (right) the I/O boards and I/O modules which are not assignable are displayed.
5. Click 'OK' to accept the assignment. The configuration file will be loaded into AO2000.  
Click 'Cancel' to abort the update. The configuration file will not be loaded into AO2000.  
Click 'Print' to save the module assignment in an ASCII file.

Perform steps 6 to 9 to change the assignment:

6. Select the I/O module in the 'Assignment' panel whose assignment shall be canceled.
  - Move the I/O module with '→' into the 'Available' panel.
7. Select the I/O module in the 'Available' panel which shall be assigned instead.
  - Select the old I/O module in the 'I/O Boards' panel which the new module shall be assigned to.
  - Move the new I/O module with '←' into the 'Assignment' panel.
8. Repeat steps 6 and 7 for each I/O module whose assignment shall be changed.
9. Click 'OK' to accept the changed assignment. The configuration file will be loaded into AO2000.

## Update from Software Version 3.0/4.0/5.0 to Software Version 5.1

### Hardware Requirements

- Software version 5.1 can be installed only in a gas analyzer equipped with Syscon III.
- In a gas analyzer with Syscon III and software version 5.1
  - maximum 3 IO boards can be installed in slots X11 to X13;
  - the number of analog I/O boards must be equal to or greater than before conversion and update;
  - the total number of digital I/O boards and modules must be greater than before conversion and update.
- I/O boards not used anymore in the gas analyzer with Syscon III and software version 5.1 must be deleted from the old gas analyzer (Syscon II, V 3.0 or 4.0) prior to conversion and update.
- If instead of the present I/O boards other I/O boards shall be installed in the gas analyzer after conversion to Syscon III, the serial numbers must be changed before the update (see **Replace the Serial Number in a Configuration File** on page 12).

### I/O Boards and I/O Modules Default Assignment

- First, the analog I/O boards are assigned to slots X11 to X13.
- Subsequently, the digital I/O boards are assigned to further free slots.
- Surplus I/O boards are assigned to 'external' slots.
- Digital I/O modules can be assigned also to digital I/O boards.

### Perform update

The update must be performed in a step-by-step manner.

1. 'Migration / Save configuration data':  
Save configuration data of (old) software version 3.0 or 4.0 or 5.0.
2. Convert gas analyzer with V 3.0 or V 4.0 from Syscon II to Syscon III.
3. 'Migration / Load new software':  
Load new software version 5.1.
4. 'Migration / Load configuration data':  
Load configuration data in AO2000.

### Save the Configuration File

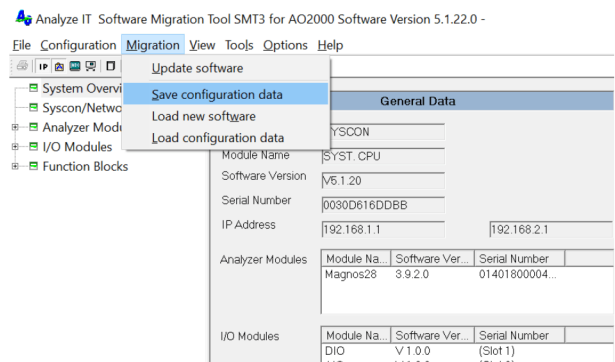


Figure 7: Saving the Configuration File

1. Select the name of the configuration file in the 'Configuration / Set archive file name' menu (see **Configure SMT** on page 8).
2. Select the 'Migration / Save configuration data' menu.
3. Click 'Yes' in the dialog box. The configuration file is saved.

### Load the Configuration File

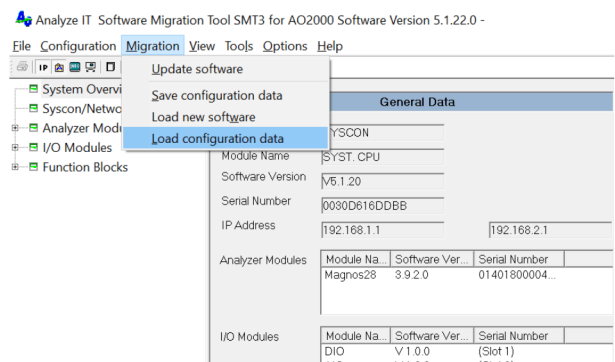


Figure 8: Loading the Configuration File

1. Select the name of the configuration file in the 'Configuration / Set archive file name' menu (see **Configure SMT** on page 8).
2. Select the 'Migration / Save configuration data' menu.
3. Click 'Yes' in the dialog box. The configuration file is loaded in the gas analyzer.

## ... 4 Operation

### Replace the Serial Number in a Configuration File

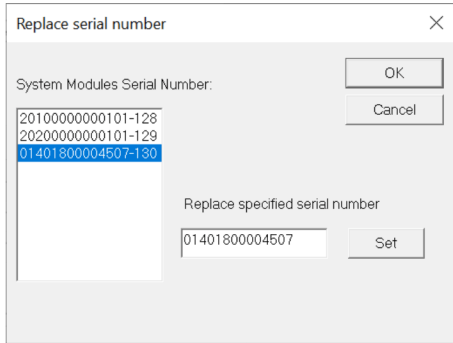


Figure 9: 'Replace serial number' tool

Button:



The configuration data from a gas analyzer can be transferred to a different gas analyzer using the 'Replace serial number' tool.

The serial number of a system module can be changed in a saved configuration file. The modified configuration file can be loaded into a gas analyzer.

#### Procedure

#### **NOTICE**

##### **Damage due to non-identical configuration**

The applicable system module (analyzer module or I/O board) type and configuration must be absolutely identical in the configuration file and gas analyzer. Otherwise the gas analyzer configuration can be damaged or destroyed.

1. Make a backup copy of the configuration file before proceeding.
2. Select the name of the configuration file in the 'Configuration / Set archive file name' menu (see **Configure SMT** on page 8).
3. Select the 'Tools / Replace serial number' menu.
4. Select the serial number to be changed in the 'System Modules Serial Number' field.
5. Replace the serial number in the 'Replace specified serial number' field.
6. Use 'Set' to enter the changed serial number in the configuration file.
7. Close the dialog box by clicking 'OK' ; this will save the changes to the configuration file.
8. Load the modified configuration file in the gas analyzer using 'Migration / Load configuration data' (see **Configure SMT** on page 8).
9. For additional gas analyzer hardware, the gas analyzer configuration must be changed after the configuration file is loaded.

## Load a Text File

### 'Change language' tool

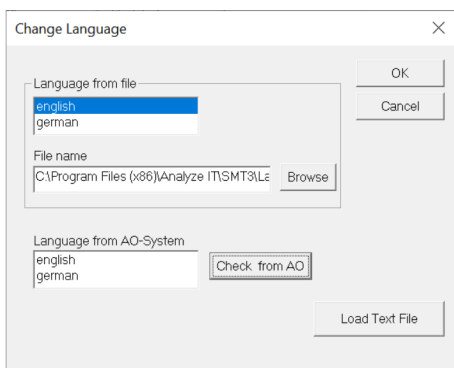


Figure 10: 'Change language' tool

Button:



The 'Change language' tool is used to load into a gas analyzer a text file containing two languages for the user interface.

By default, German and English are loaded into the gas analyzer.

### Available Language Combinations

Language Combination	File Name
German - Dutch	AOTextD_NL
English (CEM) - Portuguese	AOTextGB_CEM_BR
English (CEM) - German (CEM)	AOTextGB_CEM_D_CEM
English (CEM) - Spanish	AOTextGB_CEM_E
English (CEM) - French	AOTextGB_CEM_F
English (CEM) - Italian	AOTextGB_CEM_I
English (CEM) - Dutch	AOTextGB_CEM_NL
English - German	AOTextGB_D

#### Note

Language packages with 'CEM' in the name are required for emission measurement devices.

### Procedure

1. Select the 'Tools / Change language' menu.
2. Use the 'Browse' button to select a text file.
3. Use the 'Check from AO' button to display the languages currently in the gas analyzer (English and German in the example above).

#### Note

If the length of any text in the file differs from that loaded in the gas analyzer a message appears and any text with a different lengths is displayed in an list at the bottom of the window.

4. Load the selected text file in the gas analyzer using the 'Load Text File' button.

## ... 4 Operation

### Output Log Contents

#### 'Logbook list' tool

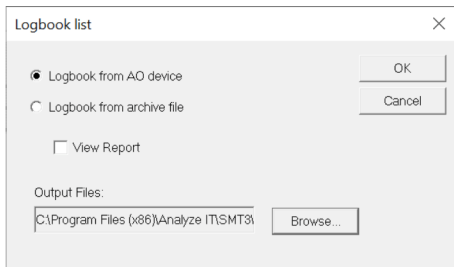


Figure 11: 'Logbook list' tool

Button:



The 'Logbook list' tool is used to save the contents of a gas analyzer or configuration file log as text (logbook listing); in this format it can be processed using MS Excel. Additionally, the log can be viewed on the screen.

#### Procedure

##### Save log as text file

- To save the AO2000 log: Set the AO2000 IP address using the 'Configuration / Set connection address' menu (see **Install SMT** on page 5).  
To save the log from a configuration file:  
Select the name of the configuration file in the 'Configuration / Set archive file name' menu (see **Configure SMT** on page 8).
- Select either 'Logbook from AO device' or 'Logbook from archive file' in the 'Tools / Logbook list' menu. Select 'View Report' to display the log on screen.
- Use the 'Browse' button to select a file name or enter the name of the file to which the log is to be saved.
- Save the log as a text file using the 'OK' button.

#### Open text file in MS Excel

- Open the saved text file in MS Excel. The Text Assistant is automatically started.
- In step 1 select the default settings by clicking 'Continue'.
- In step 2 select 'Tab' and '{none}' as text delimiters. Click the 'Continue' button.
- In step 3, in 'Preview Marked Data', mark all columns and select 'Text' as the data format. Click the 'Finish' button.
- The logbook listing will be displayed in sequence, sorted from most recent to oldest entries. In the 'Status' column, appearing messages are marked with '+', canceled messages with a '-' and informational messages with '+-'.  
Acknowledged messages are shown with a 'q' following the status symbol.

## System Overview

### 'System overview' tool

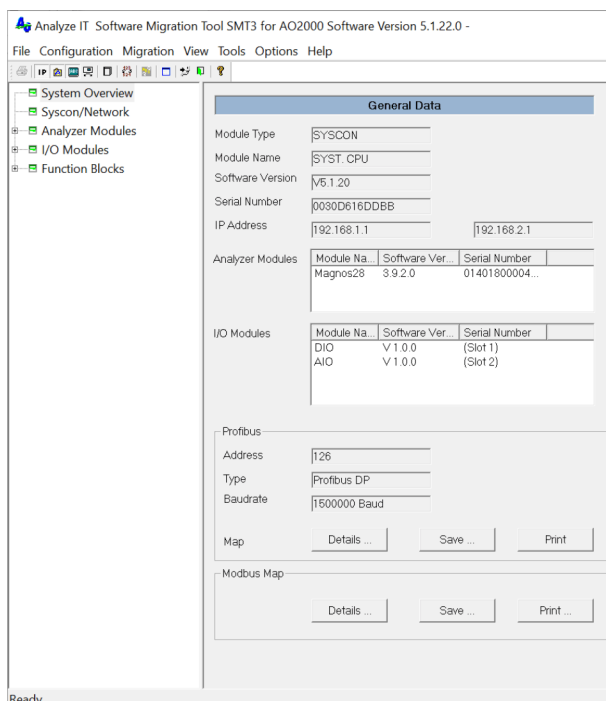


Figure 12: 'System overview' tool

Button:



The 'System overview' tool has the following functions:

- Display the system overview (including navigation using links, see **System Overview** on page 15)
- Print the system overview
- Save the system overview as an ASCII file.

#### Note

- The 'System overview' tool can only display a view of the connected gas analyzer; it cannot display the contents of a saved system overview file.

#### Procedure

1. Set the AO2000 IP address using the 'Configuration / Set connection address' menu (see **Configure SMT** on page 8).
2. Display the system overview: Select the 'Tools / System overview' menu. A tree view is displayed in the left pane. The right pane shows the details of the element selected in the tree view.

3. Save the system overview: Select the 'File / Save as' menu and enter or select the file name in which the system overview is to be saved.
4. Print the system overview: Select the 'File / Print' menu.

Button:



#### Notes

- A print preview is possible using the 'File / Print preview' menu.
- The 'Print' and 'Print preview' commands are only available if the cursor is in the tree view pane.
- Use the 'Options / Printer font' menu to select the printer font to be used for print output. This setting also applies to the print preview.

#### Navigating in the System Overview

The detail view of most elements contains linked fields that are shown in white. Clicking on one of these fields brings up the detail view of the element selected.

#### Example 1:

The system overview detail view contains lists of analyzer modules and I/O modules. Clicking on these names brings up the detail view of the analyzer module selected.

#### Example 2:

The function block detail view has the input and output fields linked. Double-clicking one of these fields brings up the detail view of any function block associated with this input or output.

#### Profibus Map

Command	Action
Details...	The Profibus map is displayed on the screen.
Save...	The Profibus map is saved into a text file. This file can be edited using e.g. Microsoft Excel.
Print	The Profibus map is output on a printer.

#### Modbus Map

Command	Action
Details...	The Modbus map is displayed on the screen.
Save...	The Modbus map is saved into a text file. This file can be edited using e.g. Microsoft Excel.
Print	The Modbus map is output on a printer.

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