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# Special Documentation

# **AMS100 Software**

Operating Instructions

Endress+Hauser
People for Process Automation

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# 1 About this document

The Endress+Hauser analyzer is shipped with AMS100 software, which is designed as an alternative method for system configuration. The AMS100 software is an optional front-end tool that gives users programming capabilities to interface with the tunable diode laser (TDL) analyzer.

This manual was developed to provide the user with an overview of the AMS100 software functionality. The information contained in this manual is divided into two main parts: Configuration and Service Support Features. The Configuration Overview chapter provides an outline of AMS100 software capabilities and uses, and provides instructions for setting up the software. The Service Support Features chapter provides the experienced user with easy to follow procedures to collect data from the analyzer for analysis. Solutions for troubleshooting are found in the chapter at the end of this manual.

## 1.1 Who Should Read This Manual

This manual should be read and referenced by anyone using the AMS100 software for installing, operating or having direct contact with the analyzer.

## 1.2 Warnings

| Structure of Information | Meaning |
|---|---|
| ⚠ WARNING<br>**Causes (/consequences)**<br>If necessary, consequences of non-compliance (if applicable)<br>▸ Corrective action | This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation can result in a fatal or serious injury. |
| ⚠ CAUTION<br>**Causes (/consequences)**<br>If necessary, consequences of non-compliance (if applicable)<br>▸ Corrective action | This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries. |
| NOTICE<br>**Cause/situation**<br>If necessary, consequences of non-compliance (if applicable)<br>▸ Action/note | This symbol alerts you to situations which may result in damage to property. |

*Table 1. Warnings*

## 1.3 Minimum Requirements

The minimum requirements for operating AMS100 on a customer-provided PC are as follows:

- Windows XP or Windows 7 operating system
- At least 2 GB of memory
- Available serial port (or USB-to-Serial adapter), if serial communications is to be used, configured between COM1 and COM50
- Available Ethernet port, if Ethernet is to be used

## 1.4 Manufacturer address

Endress+Hauser
11027 Arrow Route
Rancho Cucamonga, CA 91730
United States
www.endress.com

# 2 Configuration overview

AMS100 interfaces to all Endress+Hauser TDLAS gas analyzers that have the appropriate firmware version/revision to support AMS100. Gould Modbus RTU (GMR) protocol is used for the AMS100 default interface to the analyzers.

In general, the following analyzer/firmware versions will have some support for AMS100 communications:

- SS500 with v2.41 or later firmware
- SS1000 with v2.41 or later firmware
- SS2000 with v2.41 or later firmware
- SS3000 with v2.41 or later firmware
- SS2100 with FS, NS or NGS v5.10 or later firmware

AMS100 has a number of features for interfacing with the analyzer. Only analyzers shipped with the versions of firmware noted above will be able to support all AMS100 features. However, capture data functions within AMS100 can be used to capture unsolicited data from all analyzers, including those with older firmware versions.

AMS100 supports the following communication links to the analyzer:

- Serial (RS-232/RS-485)
- Serial over Bluetooth
- Ethernet (TCP/IP)

## 2.1 AMS100 software functionality

Through AMS100 software, the user can accomplish the following tasks:

- Install firmware apps (applications) to support the interface to analyzers
- Select a desired focus analyzer
- Select specific data from a specific analyzer (referred to as the focus report)
- Define the desired communications link to the analyzer (e.g., serial or Ethernet)
- Request a demand-poll or auto-poll report from the analyzer
- Save acquired data from the analyzer in history data logs
- Review the latest acquired analyzer data and alarm status
- Review a graphic trend of acquired measurements in the acquired data log
- Export acquired data log data to a CSV file for import into Excel
- Print the acquired data log history report
- Demand-poll analyzer diagnostic data and the latest spectrum for TDLAS gas analyzers
- Demand-poll a **Mode 6** (diagnostic data) dump from a TDLAS gas analyzer
- Save acquired analyzer spectrum and diagnostic parameters
- Review the latest analyzer spectrum and diagnostic parameters

### 2.1.1 Report capabilities

Report definitions and actions are unique for each type of analyzer (e.g., SS2000 or SS2100). There are generally four basic report types available to the user. These reports are accessed from the Operations window.

- **Primary Measurement Report**. Contains the analyzer primary measurement data.
- **Expanded Measurement Report**. Contains the primary measurement data plus additional data.
- **Diagnostics Report**. Contains diagnostic parameters, which are useful in monitoring analyzer performance and determining whether or not maintenance is required.
- **Configuration Report.** Contains analyzer configuration parameters. The user can poll parameters, adjust them, and update the new settings to the analyzer. For security purposes, the first parameter in the report is the password parameter, which must be defined correctly by the user. If the password is not defined correctly, the analyzer will reject all new settings.

## 2.2 AMS Communications

AMS100 supports two modes of communications with the analyzer:

- Capture of data with continuous output, like a broadcast, and
- Modbus 2-way command/response communication.

AMS100, or any host software able to save or record broadcast data via a serial port (e.g., Hyper-Terminal, etc.), can be used to capture the broadcast information needed for analyzer troubleshooting and diagnosis.

## 2.3 AMS100 Software Installation

The AMS100 software is available on CD and via the Endress+Hauser website (www.endress.com).

To install the software on a local computer, click on the executable file "AMS100setupXXXX.exe" (where 'XXXX' is the software version numbering, e.g., G401) and follow the install wizard instructions.

## 2.4 Connecting the Analyzer for AMS100 Communication

The following instructions provide information for connecting the analyzer via RS-232 connection to a local computer for AMS100 communication.

### 2.4.1 Point-to-point serial connection using an Endress+Hauser DB-9 data cable

**To connect the analyzer to a laptop or PC (DTE device)**

1. Connect the black wire to phoenix connector terminal 1 (RCV).
2. Connect the red wire to phoenix connector terminal 2 (XMT).
3. Connect the ground wire to phoenix connector terminal 3 (GND).

**To connect the analyzer to a wireless modem (DCE device)**

1. Connect the red wire to phoenix connector terminal 1 (RCV).
2. Connect the black wire to phoenix connector terminal 2 (XMT).
3. Connect the ground wire to phoenix connector terminal 3 (GND).

**To connect two-channel HC12 analyzers**

1. Connect the black wire for channel B to phoenix connector terminal 4 (RCV).
2. Connect the red wire to phoenix connector terminal 3 (GND).

**Initializing AMS100**

After the analyzer has been installed and is operational (refer to the installation instructions provided with the analyzer) and AMS100 has been installed, refer to the following steps to initialize the AMS100 program.

1. Identify the serial COM port that will be used for AMS100 communications to the analyzer.
2. Plug in the USB to Serial converter, if necessary.
3. Use the Device Manager to identify the COMx port number assigned to the converter.
4. Click on the AMS100 icon on the Windows desktop.

   On startup, the AMS100 Server Initialization window is displayed (refer to Figure 2–1 on page 2–5).

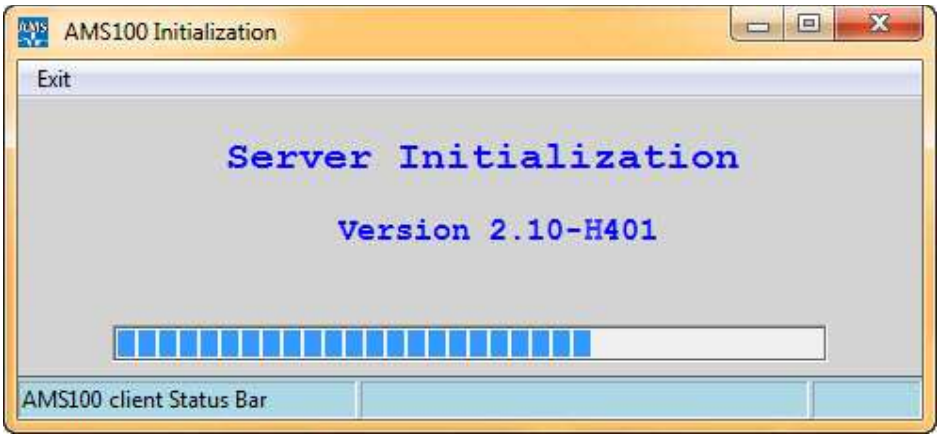



*Fig 1. Server initialization pop-up window*

Once initialized, AMS100 displays the Setup window. Configure AMS100 to communicate with the analyzer as discussed in the following section.

## 2.5 AMS100 Software Configuration

For analyzer communications, the user must select and install the appropriate app (application) in AMS100 that matches the analyzer firmware version. These apps are selected using the version pull-down menu in the Setup window. Refer to Table 2–1 for a list of available apps.

| App | Description |
|---|---|
| 501; Unassigned APP | Not used |
| 502; Custom APP 1 | Not used |
| 503; Custom APP 2 | Not used |
| 511; 2.41-A702 RevG APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.41 Rev. G |
| 512; 2.50-B602 RevA APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.50 Rev. A |
| 504; 2.50-C105 RevB APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version 2.50 Rev. B |
| 516; 2.51-E902 RevD APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.51 Rev. D |
| 517; 2.51-FB23 RDRevB APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.51 Rev. B |
| 533; 2.51-G823 RevE APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.51 Rev. E |
| 534; 2.51-GB07 RevF APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.51 Rev. F |
| 535; 2.51-I601 RevG APP | SS500/SS2000/SS3000 and SS500e/SS2000e/SS3000e Firmware version v2.51 Rev. G |
| 514; FS 5.10-B401 RevA APP | SS2100 Firmware version FS 5.10 Rev. A |
| 505; FS 5.11-C418 RevA APP | SS2100 Firmware version FS 5.11 Rev. A |
| 507; FS 5.11-C515 RevB APP | SS2100 Firmware version FS 5.11 Rev. B |
| 509; FS 5.11-C711 RevC APP | SS2100 Firmware version FS 5.11 Rev. C |
| 571; FS 5.11-C828 APP | SS2100 Firmware version FS 5.11 Rev. D |
| 537; FS 5.12-C911 RevA APP | SS2100 Firmware version FS 5.12 Rev. A |
| 538; FS 5.13-CC19 RDRevA APP | SS2100 Firmware version FS 5.13 Rev. A |
| 539; FS 5.13-D214 RDRevB APP | SS2100 Firmware version FS 5.13 Rev. B |
| 540; FS 5.13-D515 PRevB APP | SS2100 Firmware version FS 5.13 Rev. B |

| App | Description |
|---|---|
| 544; FS 5.14-D930 PRevC APP | SS2100 Firmware version FS 5.14 Rev. C |
| 556; FS 5.15-EA31 PRevD APP | SS2100 Firmware version FS 5.15 Rev. D |
| 557; FS 5.15-F116 RDRevC APP | SS2100 Firmware version FS 5.15 Rev. C |
| 558; FS 5.15-F123 PRevE APP | SS2100 Firmware version FS 5.15 Rev. E |
| 559; FS 5.15-F320 RDRevD APP | SS2100 Firmware version FS 5.15 Rev. D |
| 561; FS 5.15-G111 RDRevE APP | SS2100 Firmware version FS 5.15 Rev. E |
| 560; FS 5.16-G205 PRevF APP | SS2100 Firmware version FS 5.16 Rev. F |
| 562; FS 5.16-GC08 RDRevF APP | SS2100 Firmware version FS 5.16 Rev. G |
| 563; FS 5.16-M331 PRevG APP | SS2100 Firmware version FS 5.16 Rev. G |
| 515; NS 5.10-B401 RevA APP | SS2100 Firmware version NS 5.10 Rev. A |
| 506; NS 5.11-C418 RevA APP | SS2100 Firmware version NS 5.11 Rev. A |
| 510; NS 5.11-C711 RevB APP | SS2100 Firmware version NS 5.11 Rev. B |
| 541; NS 5.12-CC20 RDRevA APP | SS2100 Firmware version NS 5.12 Rev. A |
| 542; NS 5.12-D219 PRevC APP | SS2100 Firmware version NS 5.12 Rev. C |
| 543; NS 5.12-D925 RDRevB APP | SS2100 Firmware version NS 5.12 Rev. B |
| 545; NS 5.13-DA04 PRevD APP | SS2100 Firmware version NS 5.13 Rev. D |
| 566; NS 5.13-F401 RDRevC APP | SS2100 Firmware version NS 5.13 Rev. C |
| 567; NS 5.14-H401 PRevE APP | SS2100 Firmware version NS 5.14 Rev. E |
| 568; NS 5.14-H516 PRevF APP | SS2100 Firmware version NS 5.14 Rev. F |
| 569; NS 5.14-M331 PRevG APP | SS2100 Firmware version NS 5.14 Rev. G |
| 513; NGS 5.10-AA13 RevA APP | SS2100 Firmware version NGS 5.10 Rev. A |
| 518; NGS 5.10-B628 RevB APP | SS2100 Firmware version NGS 5.10 Rev. B |
| 508; NGS 5.10-C711 RevC APP | SS2100 Firmware version NGS 5.10 Rev. C |
| 520; GNS 5.11-E515 RevB APP | SS2100i Firmware version GNS 5.11 Rev. B |

The user can pre-configure AMS100 with up to six different apps for communications to different types of analyzers. These “slots” are selectable via the analyzer pull-down menu on the Setup window.

Once configured, the user can communicate with these types of analyzers simply by selecting the desired analyzer type from the analyzer list to be the selected analyzer.

### 2.5.1 Communicating with the analyzer

Communicating with the analyzer requires that the appropriate analyzer app is installed in AMS100 and that the communications link, analyzer address and other pertinent data are pre-defined. The AMS100 Setup window is used to specify this information.

Use the following steps on the Setup window to configure AMS100 for communication with an analyzer.

1. Identify the firmware version used in the analyzer.

2. Identify the matching firmware version app in the AMS100 dropdown menu in the Firmware field.
3. Enter the communications settings.
4. Click on the **APPLY** button to load the firmware app and communications settings into the active analyzer field.

**NOTICE**

► For customers with more than one type of Endress+Hauser analyzer, up to six different firmware apps can be loaded with the appropriate communications settings into Analyzer fields 2 to 6.

To upload apps for additional analyzers:

1. Select the app number you want to use and enter it into the *Analyzer* field.
2. Repeat steps 1-3 in Error! Reference source not found..

The Setup window is used to set the basic communications information between the analyzer and AMS100. The toolbar located at the top of the Setup window is used to access different windows in AMS100. These windows include Operation, Spectra, Trends and Event Log, and are used to interface with the analyzer.

## 2.6 Setup window

The Setup window is the first screen viewed after system initialization and is used to configure AMS100 for communicating with the analyzer.

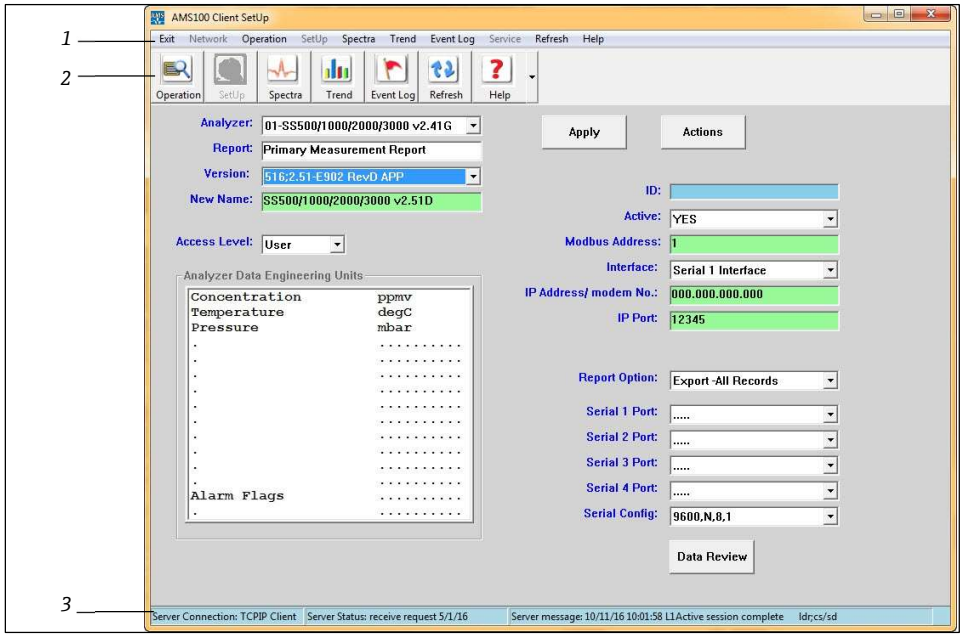



*Fig 2. Setup window*

1. *Menu bar*
2. *Tool bar*
3. *Status bar*

Before AMS100 can communicate with an analyzer, the following must be defined in the AMS100 Setup window:

- **Analyzer.** The analyzer slots in the AMS100. Slots can be pre-configured to support many of the analyzers available from Endress+Hauser. The user can redefine this configuration using the *Version* field. This field enables the user to reconfigure the AMS100 analyzer slots to support multiple analyzers of the same type or for multiple types of analyzers.
- **Interface.** The desired communication interface to the analyzer
- **IP address/modem No.** The analyzer address, e.g., Modbus address, IP address, IP port, etc.
- **Serial n port.** The serial COM port for a serial interface (This port must exist in the computer.)
- **Serial Config.** The baud rate, parity, #data bits for the communication link

**NOTICE**

- For an SS500/SS2000/SS3000 analyzer, choose 9600,N,8,1.
- For all SS2100 analyzers, choose xxxx,N,8,1 where xxxx must match the baud rate defined in the analyzer.

- Other settings of interest for the selected analyzer and report

After the desired data is defined, click the **Apply** button to install the settings for the analyzer. Once the configuration is complete, AMS100 will not require this procedure to be repeated unless there is a change to the setup.

### 2.6.1 Configuring the analyzer type

The first step involves installing the firmware apps for the desired analyzer types from the list of available apps (refer to Table 2–1 on page 2–5).

1. Click the **Analyzer** drop-down list for available analyzer slots.
   a. If the desired analyzer type has already been installed in the slot, select the slot/analyzer as the selected analyzer and skip the remaining steps.
   b. If the desired analyzer type is not listed, select the desired slot to use for the analyzer.
2. Click the **Version** drop-down list and select the desired analyzer type/version.
3. Click the **Apply** button to install the analyzer, which then becomes the selected analyzer.

For customers with more than one type of Endress+Hauser analyzer, up to six different firmware apps can be loaded with the appropriate communications settings into Analyzer fields 2 to 6.

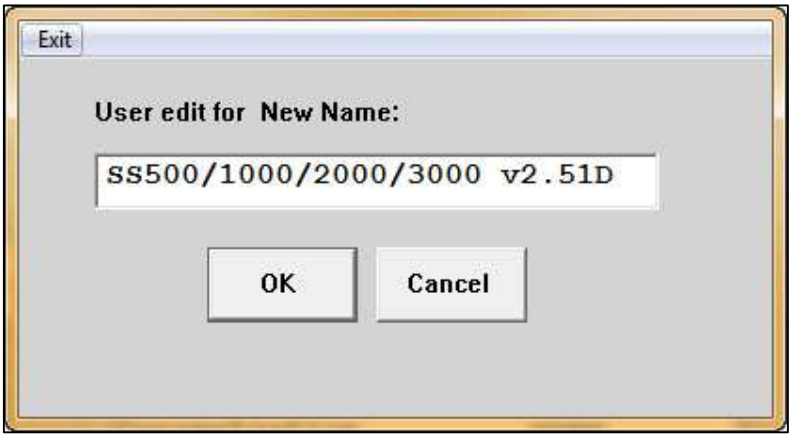
### 2.6.2 Uploading apps for additional analyzers

1. In the Analyzer field, select the additional analyzer type with its associated app number.
2. Repeat steps 1 to 3 Error! Reference source not found..

### 2.6.3 Creating a unique name for the selected analyzer (optional)

This step allows the user to create a unique name for the selected analyzer. The user can name each analyzer to conform to specific descriptions, such as, “SS2000 in Big Valley” or “$H_2S$ in System 5.”

1. Click on the **New Name** field. A pop-up window displays with an editable field for the analyzer name.

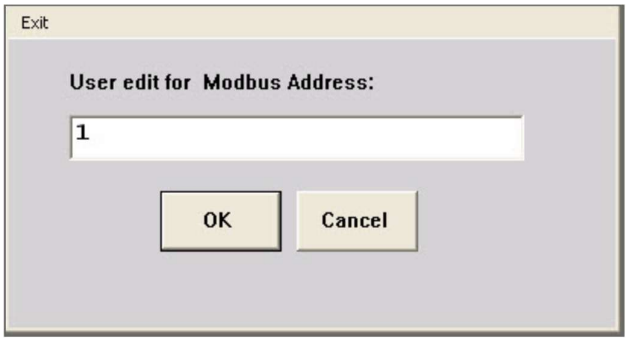



2. Enter the new analyzer name.
3. Click the **OK** button.
4. Click the **Apply** button to save the new name.

### 2.6.4 Defining communication parameters

Use the following steps to define the desired communications link and parameters for the selected analyzer. The editable fields will display a green background.

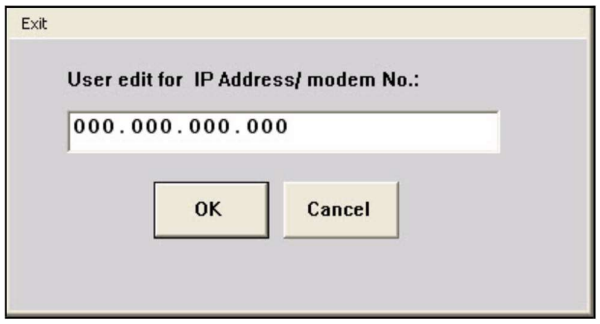
1. Click inside the **Modbus Address** field. A pop-up window displays with an editable field for the address.




2. Enter the Modbus address for the selected analyzer.
3. Click the **OK** button to save the change.
4. After the address data is entered, click the **Apply** button to save the settings for the selected analyzer.

### 2.6.5 Using the Interface field to define the communication as serial or IP

1. Determine if the communication is IP or Ethernet, Ethernet, or serial:
   a. If the link is IP or Ethernet, click inside the **IP address/modem** field. A pop-up window displays with an editable address field. Define the IP address.




   b. If the interface is Ethernet, click inside the **IP Port** field and use the pop-up window to define the Ethernet port.
   c. If the link is serial, use the serial fields to define the serial communications parameters, such as which COM port and baud rate to use.
2. Click the **OK** button to apply the changes.
3. After all setup data is entered, click the **Apply** button to install the settings for the select analyzer.

Once the analyzer communications information have been defined, the AMS100 is ready to communicate with the analyzer via the Operation or Spectra windows.

### 2.6.6 AMS100 to analyzer communication session

Before AMS100 can communicate with an analyzer, the user must define the analyzer information. Refer to Setup window for instruction.

1. Using the serial data cable, Ethernet cable or wireless service, the user initiates a command to connect with the analyzer.
2. The user can click on the **Read Analyzer** or **Update Analyzer** button from the Operation window, or can request an “Action.” When the analyzer answers, AMS100 automatically recognizes that the link is established.
3. AMS100 can communicate with the analyzer using Modbus protocol only if:
   a. Both use Modbus GMR protocol
   b. Both use the same data rate, i.e., baud rate

NOTICE

- The baud rate for all SS500, SS1000, SS2000(e), SS3000(e) analyzers is 9600. An SS2100 analyzer may have a baud rate of 115200, 57600, 68400, 19200 or 9600. If the baud rate for the analyzer is unknown, the user can use the analyzer keypad to identify the baud rate setting. Refer to the analyzer Operator's Manual for more information.

c. AMS100 solicits information; i.e., sends a command in either Modbus or Diagnostic protocol language.

d. The analyzer receives the command, understands it, and responds with the desired information using the appropriate protocol or language.

e. AMS100 receives the information, processes it, is satisfied and disconnects the link, terminating the communications session.

AMS100 can support a serial or an Ethernet (TCP/IP) connection to the analyzer. Once the link definition is defined, it will remain in effect unless the link parameters change or unless the user selects a different app or configuration for the analyzer.

### 2.6.7 Access level and report option settings

**Access Level** allows the user to select the appropriate service access level.

- User level provides the day-to-day user with access to all important AMS100 functions.
- Advanced level provides access to special functions needed by the trained service user.
- Expert level is reserved and should not be used unless directed to do so by SpectraSensors service personnel.

**Report** is associated with the Report History button on the Operations window. When primary measurement modbus data is polled from the analyzer using the Read Analyzer button or via the auto-poll option, this data is saved in a history log. The Report field allows the user to select the option to be used for output of this history data when the user clicks on the Report History button on the Operations window.

### 2.6.8 Testing the communications link

To test the communications link:

1. On the Setup window, click on the **Actions** button.
2. Click on the **Get Analyzer ID** action.
3. If the communications link has been correctly configured, the Analyzer ID will be retrieved from the analyzer and appear in the ID field.

## 2.7 Operation window

Click on the **Operation** button from the toolbar to view this window. The button at the top of the screen for the active window is grayed out.

The Operations window is the home page for the user. From the Operation window, the user is able to interface with the analyzer to poll and review data, and to configure parameters.

The Analyzer field enables the user to select the analyzer of interest. A number of analyzer types are pre-installed in the AMS100. The user can select any of these, or enter a new type.

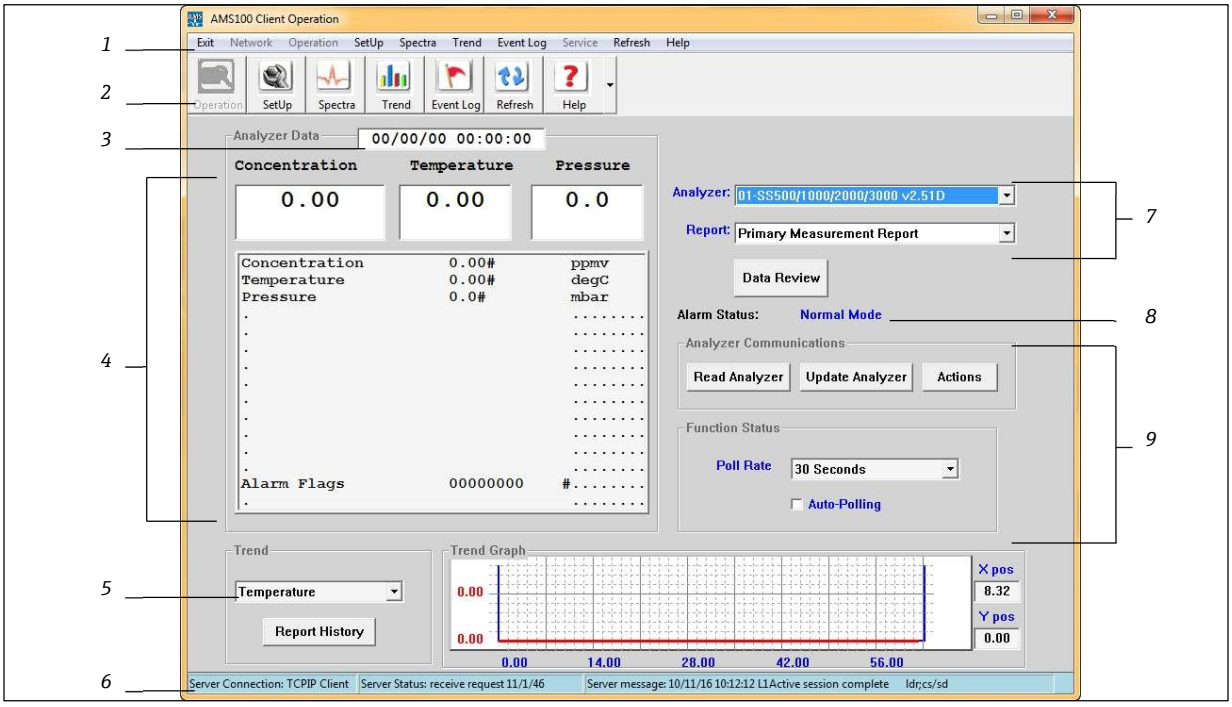



*Fig 3. Operations window*

1. *Menu bar*
2. *Tool barr*
3. *Date/time*
4. *Report parameters*
5. *Trend control*
6. *Status bar*
7. *Analyzer report*
8. *Alarm status*
9. *Communication controls*

The **Report** list allows the user to select a specific analyzer data, i.e., the focus report.

The **Actions** button located in the Communication controls area is used to request special diagnostic and service oriented commands to the analyzer (see “Service Support Features” on page 3-1 for details).

### 2.7.1 Read analyzer: Demand-polling the analyzer

Demand-polling the analyzer uses Modbus protocol, therefore the Modbus protocol must be enabled in the analyzer by setting Modbus Mode = GMR.

The analyzer requires the Modbus Mode of the analyzer to be set = 0 to enable unsolicited or broadcast output of diagnostic data to be captured by AMS100. The analyzer should be set = 1 (GMR) Gould Modbus to support 2-way Modbus communications. This parameter is now set automatically when the user selects various “Actions” to eliminate the need for manually changing this setting.

**Start Data Capture** automatically sets Modbus Mode=0 for capture of diagnostic unsolicited broadcast data.

The following Actions set the Modbus Mode = 1 which is required for Modbus communications:

- Get Analyzer ID on the Setup Window
- Set ModbusMode=GMT
- Stop Data Capture

Alternately the analyzer Modbus Mode can be changed from the analyzer keypad using **#**(MODE) **2** Parameter Setting Mode and password 3142.

A demand poll is a request by the user to poll data on demand from the analyzer. To demand-poll the focus report from the analyzer, click on the **Read Analyzer** button to poll the focus report. When the user selects this function, AMS100 will attempt to poll the focus report data from the selected analyzer.

### 2.7.2 Selecting a report

The following steps are used to define a report for the analyzer. To define communications parameters or setup for communications to an analyzer, refer to Setup window → 📄.

1. Click on the **Operations** button at the top of the window.
2. Select the appropriate analyzer to which the user wants to communicate.
3. Select the desired report, e.g., the focus report, containing the desired parameters that the user wants to poll from the analyzer or to use to configure the analyzer.

### 2.7.3 Auto-polling the analyzer

The Operations window allows the user to initiate auto-polling of the analyzer at a user-defined frequency.

1. Use the above steps to establish communications with the analyzer.
2. During the Read Analyzer poll (described above), note the approximate time required to poll the focus report from the analyzer.
3. Select a desired auto-poll frequency that exceeds the poll time noted in Step 2.

   **NOTICE**

   ▶ In general, the user should avoid selecting a frequency shorter than the time noted in Step 2 due to bandwidth limitations.
4. Click on the **Auto-Polling** checkbox in the Function Status field.

Measurement Report data acquired from the analyzer is automatically saved in a history or data log file. The “Real Time” trend in the blue bar at the bottom of the Operations window allows the user to graphically review the trend of any desired measurement or parameter in the focus report as it is acquired.

### 2.7.4 Update analyzer: Changing parameter settings in the analyzer

**NOTICE**

▶ This function uses the Modbus protocol, therefore the Modbus protocol must be enabled in the analyzer by setting Modbus Mode = GMR.

After initiating a request for the AMS100 to poll the analyzer (send a data request using the Modbus protocol), this button is used to change any parameter settings listed in the Configuration Report for the selected analyzer.

To make a parameter change, use the following steps:

1. Establish communications with the analyzer as defined in the instructions given under Setup window.
2. Click on the **Operations** button from the Toolbar.
3. From the Report field, select **Configuration Report** as the focus report.
4. Click on the **Read Analyzer** button in the Analyzer Communications field to poll the current configuration settings from the analyzer.

   **NOTICE**

   ▶ This is a required step to ensure AMS100 contains the current analyzer settings.
5. Review the current settings.
6. Double-click on each setting to be changed and edit the value as needed.
7. Enter the appropriate password in the first item in the report.
8. When editing is complete, click on the **Update Analyzer** button to write the parameters in the report and the new settings to the analyzer.

### 2.7.5 Actions: Requesting diagnostic protocol actions

The Actions button allows the user to interface with the selected analyzer using an assortment of Service Support Diagnostic Protocol commands. These commands are discussed in detail in the “Service Support Features” on page 3-1.

## 2.8 Spectra diagnostics window

The diagnostics information obtained from this window allows the user to review and evaluate the integrity of the analyzer measurement and performance. This information can be useful in determining whether or not analyzer maintenance is needed.

The Spectra Diagnostics window is used perform the following functions:

- Poll diagnostic parameters and spectra from the analyzer
- Plot the acquired spectra for analysis
- Capture diagnostic data from the analyzer into a text file

Click the **Spectra** button from the Toolbar for the Spectra Diagnostics window. Only the functions related to the selected analyzer will be active in the window. All other buttons will be grayed out.

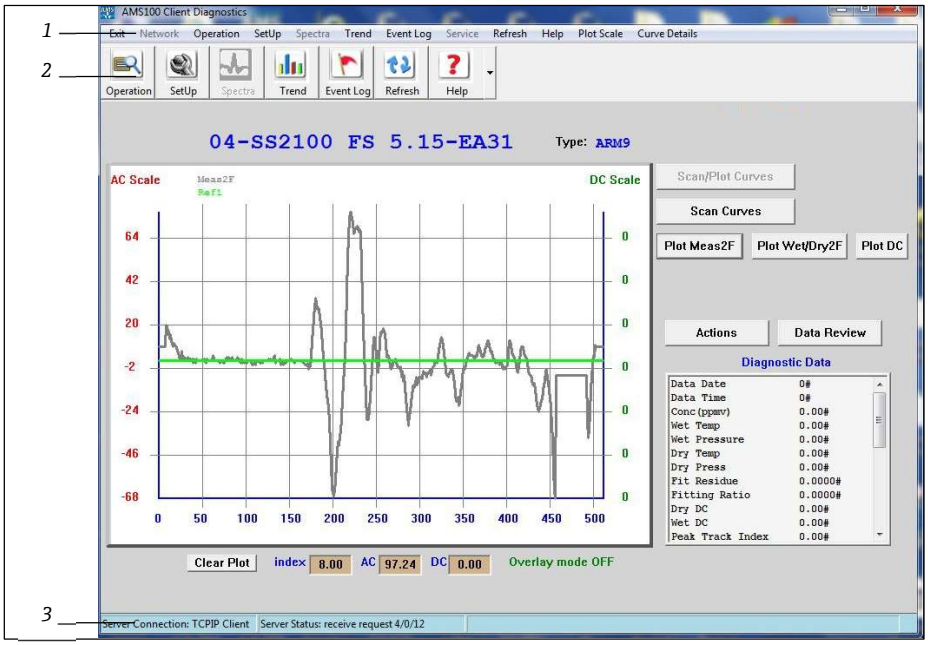



*Fig 4. Spectra diagnostics window*

1. *Menu bar*
2. *Tool bar*
3. *Status bar*

Click on the **Actions** button to display a dropdown list of control and service actions. These options allow the user to reconfigure parameters for the selected analyzer and capture diagnostic data, which can be sent to Endress+Hauser for analysis.

**NOTICE**

▶ Some functions require Modbus Mode be set = 0 (e.g., capture of measurement data and diagnostics in **Mode 1** (**#1**) requires Modbus to be disabled). Setting Modbus Mode = 0 whenever in the Spectra Diagnostics window is recommended.

Refer to the procedures outlined in Spectra window service actions → 🗎 for more information on specific processes.

## 2.9 Trend window

The Trend window allows the user to graphically view historical data acquired from the target analyzer. Clicking on the **Trend** button from the Menu or Toolbar navigates the user to the Trend window. The user can page through the data using the Latest, Next and Previous buttons, and can select a measurement of interest for review (refer to **Error! Reference source not found.**).

Placing the cursor on the trend will highlight the X and Y coordinates for the trend.

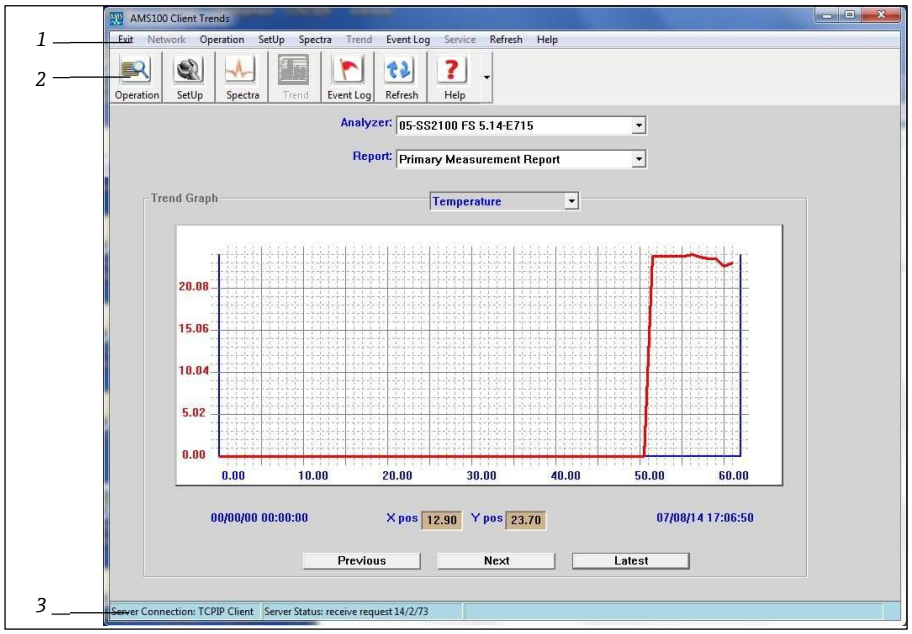



*Fig 5. Trend window*

1. *Menu bar*
2. *Tool bar*
3. *Status bar*

## 2.10 Server Events window

The AMS100 XML server acts as the communications front-end for the system. The Server Events window allows the user to review the latest audit trail of server events. This is particularly helpful in diagnosing potential communications issues with the analyzer.

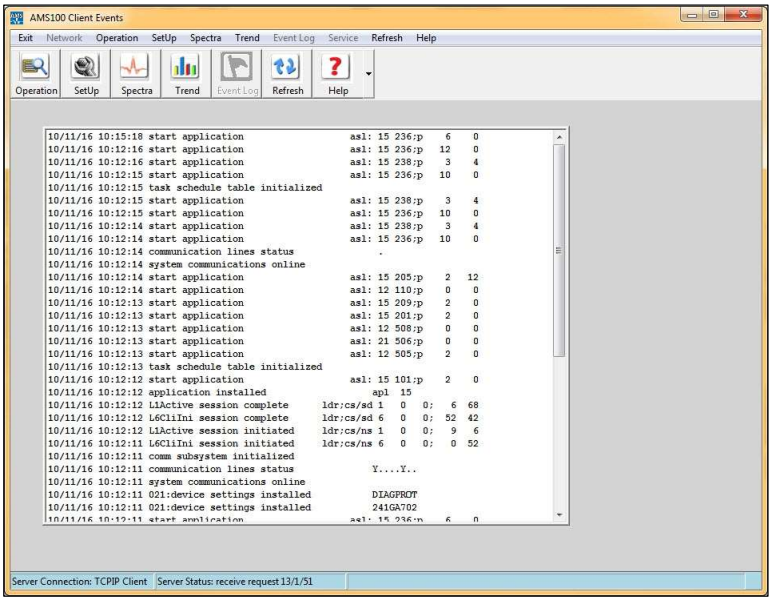



*Fig 6. Server events window*

# 3 Service support features

The procedures in this section should be performed by experienced users. After communications is established with the analyzer, the AMS100 software provides features to allow the user to assess analyzer performance and capture important diagnostic information. This information is reviewed by Endress+Hauser Technical Services to diagnose the performance of the analyzer. Refer to Service → 🖹.

This chapter reviews the following features:

- Service feature operation
- Activating service actions
- Capturing data

For successful communications between AMS100 and the analyzer, the AMS100 baud rate setting must match that defined in the analyzer. If a wireless modem is being used for the interface, the baud rate setting for the serial port in the wireless modem must also match. Do not change the baud rate in the analyzer unless it is also changed in the AMS100 and the field wireless modem.

## 3.1 Service feature operation

Operation of AMS100 is conducted primarily through the Operations and Spectra windows. The following sections provide instructions for accessing data and diagnostics through the software.

## 3.2 Operation window service actions

1. Click the **Operation** button from the Toolbar. The Operation window displays.

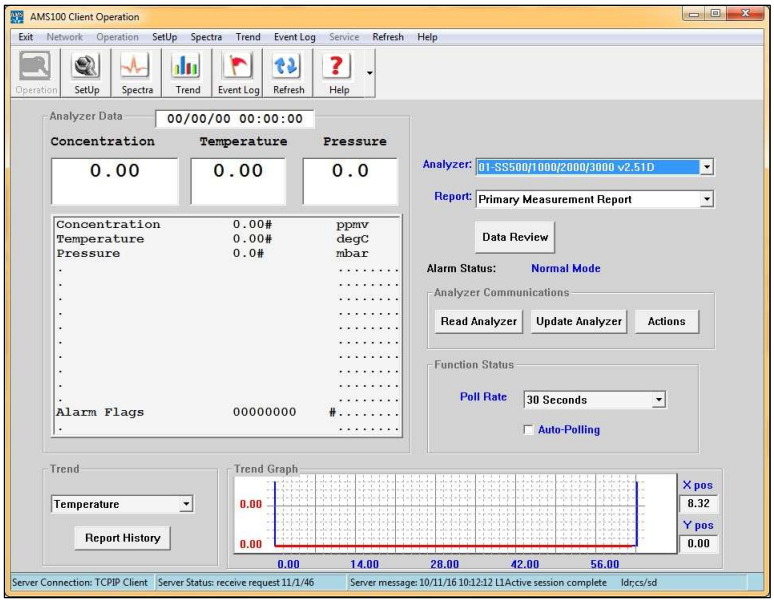



*Fig 7. Operation window*

   The button at the top of the screen for the active window is grayed out.

2. Click the **Actions** button in the Analyzer Communications area.

   A pop-up Actions Service menu will display with the control and service actions available for the analyzer.

3. Select the control and service action desired to re-configure the pertinent parameters of the selected analyzer. Refer to the following section for a list of available service actions by analyzer type.

This captured data can be sent to Endress+Hauser for analysis.

**NOTICE**

▶ The actions available to the user will be specific to the selected analyzer.

### 3.2.1 Operation window service actions for the SS500/SS2000/SS3000

For an SS500/SS2000/SS3000 analyzer, the following options will display in the “Actions Service” pop-up window after clicking on the **Actions** button.

| Service Action | Definition |
|---|---|
| **Actions** | |
| +Wiki Help03 Info | Accesses helpful hints information |
| +Initialize Comm | Initializes the AMS100 communication interface |
| +Stop Active Comm | Stops active communication to the selected analyzer |
| +Clear History | Clears all saved history for the selected report |
| +Export to File | Exports the current focus report data to a text file |
| +Capture Config | Creates a text file containing selected report data and a Mode 6 dump |
| +Customer Password | Sets the password in the analyzer to the customer password |
| +Clear Password | Clears the analyzer password |
| +Set ModbusMode=0 | Disables Modbus, enables Mode 1 diagnostic output |
| +Set ModbusMode=GMR | Disables Mode 1 output, enables Gould Modbus mode |
| **Data capture** | |
| +Get Spot Mode6 | Requests and captures a Mode 6 (diagnostics data) dump |
| +Run 15min Program | Initiates the pre-defined 15-minute data capture program |
| +Start Data Capture | Enables capture of all incoming data from analyzer |
| +Capture Mode6 Dump | Requests a Mode6 dump during the data capture cycle |
| +Start Capture w/TS | Enables capture with a time stamp of all incoming data from analyzer |
| +Stop Data Capture | Terminates the capture of incoming data from analyzer |

### 3.2.2 Operation window service actions for the SS2100

For an SS2100 analyzer (ARM9), the following options will display in the “Actions Service” pop-up window after clicking on the **Actions** button.

| Service Action | Definition |
|---|---|
| **Actions** | |
| +Wiki Help03 Info | Access helpful hint information |
| +Initialize Comm | Initializes AMS100 communications interface |

| Service Action | Definition |
|---|---|
| +Stop Active Comm | Stop active communication to selected analyzer |
| +Clear History | Clears all saved history for the selected report |
| +Export to TextFile | Exports the current selected report data to a text file |
| +Customer Password | Set the password in the analyzer to the customer password |
| **Analyzer settings** | |
| +Clear Password | Clear the analyzer password |
| +Set ModbusMode=0 | Disable Modbus, enable Mode 1 diagnostic output |
| +Set ModbusMode=GMR | Disable Mode 1 output, enable Gould Modbus mode |
| +Set ModbusMode=DMR | Disable Mode 1 output, enable Daniel Modbus mode |
| **Data capture** | |
| +Get Spot Mode 6-3 | Request Mode 6 (Diagnostics data) dump for three wet cycles |
| +Get Spot Mode 6-10 | Request Mode 6 (Diagnostics data) dump for up to 10 wet cycles |
| +Get Spot Parm Dump | Request parameter dump |
| +Run 15min Program | Initiate a pre-defined 15-minute data capture program |
| +Run 30min Program | Initiate the pre-defined 30-minute data capture program |
| +Start Data Capture | Start capture of all incoming data from analyzer |
| +Mode 6-1 Cycle | Request a Mode 6 dump for one wet cycle |
| +Mode 6-3 Cycles | Request a Mode 6 dump for three wet cycles |
| +Mode 6-10 Cycles | Request a Mode 6 dump for up to 10 wet cycles |
| +Parameter Dump | Request parameter dump |
| +Ref Curve Dump | Request a Reference Curve dump |
| +Factory Mode 6 | Request a Factory Mode 6 dump |
| +Normal Mode | Return to Normal Mode (Mode 1) |
| +Stop Data Capture | Terminate the capture of incoming data from analyzer |
| **Modbus** | |
| +Start Validation | *Initiate an analyzer validation cycle* |
| +Ethernet 2-Way COMM | *Assign 2-way communications to the Ethernet port* |
| +Serial 2-Way COMM | *Assign 2-way communications to the customer serial port* |

## 3.3 Spectra window service actions

To access the Spectra window service functionality, click the **Spectra** button from the Toolbar. The Spectra window displays (refer to **Error! Reference source not found.**). The button at the top of the screen for the active window is grayed out.

Buttons available from this window allow the user to perform the following functions:

- Poll diagnostic parameters
- Plot the acquired spectra for analysis
- Capture diagnostic data from the analyzer in a text file. This data can be imported into Excel for detailed analysis by the user or by Endress+Hauser service personnel.
- Acquire and plot spectra from an SS500, SS1000, SS2000 or SS3000 analyzer with **Scan/Plot Curves** button
- Acquire spectra data from an SS2100 analyzer with **Scan Curves** button.
- Plot the acquired SS2100 spectra curves with the **Plot** button.
- Display Control and Service actions to reconfigure parameters for the analyzer and capture data that can be sent to Endress+Hauser with the **Actions** button.

**NOTICE**

► The actions available to the user from this window will be specific to the selected analyzer.

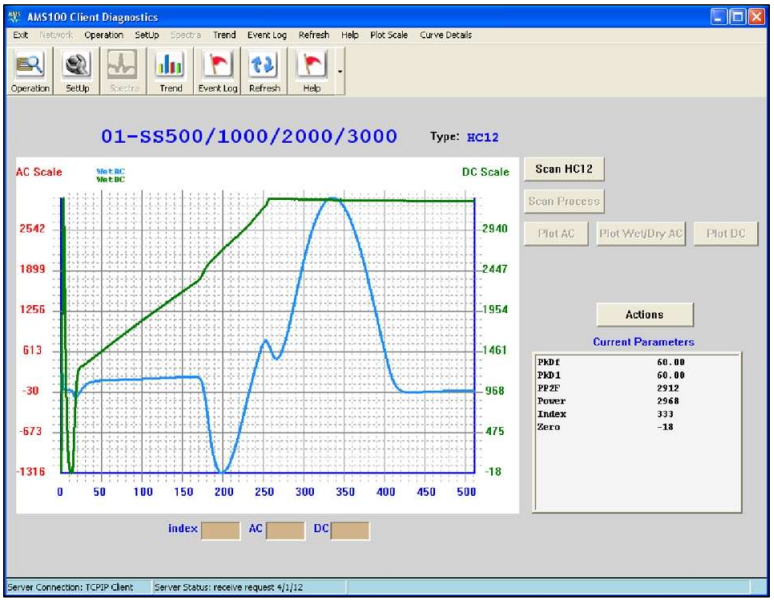



*Fig 8. Spectra window*

### 3.3.1 Spectra window service actions for the SS1000 and SS500/SS2000/SS3000

The following actions are available for an SS1000 and SS500/SS2000/SS3000 analyzer. The following options will display in the “Actions Service” pop-up window after clicking on the **Actions** button.

| Service Action | Definition |
|---|---|
| **Actions** | |
| +Connect to Port | Instructs AMS100 to connect to the requested COM port if the port was not available on AMS100 startup |
| +Set Modbus Mode = 0 | Disables Modbus, enables **Mode 1** diagnostic output |
| +Set Modbus Mode = GMR | Disables **Mode 1** output, enables Gould Modbus mode |
| +Get Diagnostic Data | Polls and displays selected parameters in the **Mode 1** field |

| Service Action | Definition |
|---|---|
| +Export Curves | Converts current plots to a file for email or Excel import |
| **Data capture** | |
| +Get Spot Mode6 | Request **Mode 6** dump |
| +Run 15min Program | Initiates a pre-defined 15-minute data capture program |
| +Start Data Capture | Enable capture of all incoming data from analyzer |
| +Capture Mode 6 Dump | Request **Mode 6** dump during the data capture cycle |
| +Start Capture w/TS | Enable capture with time stamp of all incoming data from analyzer |
| +Stop Data Capture | Terminate the capture of incoming data from analyzer |
| **Overlay curves** | |
| +Get First WetAC | Enable overlay mode, poll and plot the AC spectrum |
| +Get First WetDC | Enable overlay mode, poll and plot the DC spectrum |
| +Overlay New AC | Poll and overlay plot with a new AC spectrum |
| +Overlay New DC | Poll and overlay plot with a new DC spectrum |
| +Overlay Mode Off | Turn off plot overlay mode |

### Capturing data for the SS500/SS2000/SS3000

To capture all received data to a text file:

1. From the Spectra window, click the **Actions** button. The Actions Service window displays.
2. Select **+Start Data Capture**. AMS100 will begin capturing **Mode 1** data.
   The status bar will indicate the number of received data blocks.
3. Select **+Capture Mode 6 Dump** to request a **Mode 6** dump.
4. Select **+Stop Data Capture** to terminate the capture when completed.
   A pop-up window will display providing a user prompt to save the captured data to a file or exit.

### Mode 6 (diagnostics data) dump for the SS500/SS2000/SS3000

To capture a Mode 6 dump only:

1. From the Spectra window, click the **Actions** button.
2. Select **+Get Spot Mode 6-all** to request and capture a **Mode 6** dump.
   A pop-up window will display providing a user prompt to save the captured data to a file or exit.

### Overlaying multiple spectra for the SS500/SS2000/SS3000

To overlay multiple spectra (e.g., AC spectra):

1. Click on the **Clear Plot** button at the bottom left of the window.
2. Click the **Actions** button, then select **+Get First WetAC** to enable overlay mode, poll and plot the AC spectrum.
3. Select **+Overlay New AC** to poll and overlay new AC spectrum. Repeat this step for each new AC spectrum overlay.
4. Select **+Overlay Mode Of**f to turn off the plot overlay mode.

### 3.3.2 Spectra window service actions for the SS2100

The following actions are available for an SS2100 analyzer (ARM9). The following options will display in the "Actions Service" pop-up window after clicking on the **Actions** button.

| Service Action | Definition |
|---|---|
| **Actions** | |
| +Connect to Port | Instructs AMS100 to connect to the requested COM port if the port was not available on AMS100 startup |
| +Get Diagnostic Data | Polls and displays selected parameters in the **Mode 1** field |
| +Set Modbus Mode = 0 | Disables Modbus, enables **Mode 1** diagnostic output |
| +Set Modbus Mode = GMR | Disables Mode 1 output, enables Gould Modbus mode |
| +Export Curves | Converts current plot to a file for email or Excel import |
| **Data capture** | |
| +Get Spot Mode6-3 | Requests **Mode 6** (diagnostic data) dump for three wet cycles |
| +Get Spot Mode6-10 | Requests **Mode 6** (diagnostics data) dump for up to 10 wet cycles |
| +Get Spot Parm Dump | Requests parameter dump |
| +Run 15min Program | Initiates a pre-defined 15-minute data capture program |
| +Run 30min Program | Initiates a pre-defined 30-minute data capture program |
| +Start Data Capture | Starts capture of all incoming data from analyzer |
| +Mode6-1 Cycle | Requests a **Mode 6** dump of one wet cycle |
| +Mode6-3 Cycles | Requests a **Mode 6** dump for three wet cycles |
| +Mode6-10 Cycles | Requests a **Mode 6** dump for up to ten wet cycles |
| +Parameter Dump | Requests a parameter dump |
| +Ref Curve Dump | Requests a Reference Curve dump |
| +Stop Data Capture | Terminates the capture of incoming data from analyzer |
| **Overlay curves** | |
| +First Wet2F | Enables overlay mode, poll/plot wet2f spectrum |
| +First Dry2F | Enables overlay mode, poll/plot dry2f spectrum |
| +First WetDC | Enables overlay mode, poll/plot WetDC spectrum |
| +First DryDC | Enables overlay mode, poll/plot DryDC spectrum |

| Service Action | Definition |
|---|---|
| +First Meas2F | Enables overlay mode, poll/plot Meas2F spectrum |
| +Overlay New Wet2F | Poll/overlay plot with a new Wet2F spectrum |
| +Overlay New Dry2F | Poll/overlay plot with a new Dry2F spectrum |
| +Overlay New WetDC | Poll/overlay plot with a new WetDC spectrum |
| +Overlay New DryDC | Poll/overlay plot with a new DryDC spectrum |
| +Overlay New Meas2F | Poll/overlay plot with a new Meas2F spectrum |
| +Exit Overlay Mode | Turns off plot overlay mode |

**Capturing data for the SS2100 (ARM9)**

To capture received data from the analyzer to a text file:

1. From the Spectra window, click the **Actions** button.
2. Select **+Start Data Capture**. The verification pop-up window displays.


3. Click **Yes**. The AMS100 will begin capturing any **Mode 1** data received from the analyzer.
4. Select **+Mode6-x Cycles** (where 'x' defines the number of cycles) to request a **Mode 6** dump.
5. Click **Yes** when prompted.
6. Click **Yes**. AMS100 will capture the incoming **Mode 6** data.

   **NOTICE**

   ▶ The Server Message in the AMS100 status bar will indicate the number of data blocks received from the analyzer. When the requested Mode 6 data has been received, AMS100 will continue to capture any Mode 1 data if Modbus Mode = 0 in the analyzer.
7. Select **+Stop Data Capture** to terminate the capture when completed.
8. Click **Yes** when the "Are you sure" window displays.

   AMS100 will stop the data capture. A pop-up window will display providing a user prompt to save the captured data to a file or exit.

**Parameter dump for the SS2100 (ARM9)**

Use the following procedure to execute a parameter dump:

1. From the Spectra window, click the **Actions** button.
2. Select **+Parameter Dump** to request a dump of the analyzer parameters.
3. Click **Yes** when prompted.

**Mode 6 (Diagnostics Data) or Parameter Dump Only for the SS2100 (ARM9)**

To implement a **Mode 6** data dump only, use the following procedure:

1. From the Spectra window, click the **Actions** button and select **+Get Spot Mode 6-x** (where 'x' defines the number of cycles) to request and capture a Mode 6 dump.
2. Click **Yes** when prompted. The incoming **Mode 6** data will be captured. When the Mode 6 data dump is complete.
3. Select **+Get Spot Parm Dump** to request and capture a parameter dump.

   A pop-up window will display providing a user prompt to save the captured data to a file or exit.

**Review the current spectra for the SS2100 (ARM9)**

To review the current spectra, use the following procedure:

1. From the Spectra window, click the **Scan Curves** button to poll all spectra.
2. Click on the **Plot MEAS2F** button to review these spectra.
3. Click on the **Plot Wet/Dry2F** button to review these spectra.
4. Click on the **Plot DC** button to review these spectra.

**Plot/overlay multiple Wet2F curves for the SS2100 (ARM9)**

Use the following procedure to plot and/or overlay multiple wet2F curves:

1. From the Spectra window, click the **Clear Plot** button.
2. Select **+First Wet2F** to enable the overlay mode and poll/plot the wet2F spectrum.
3. Select **+Overlay New Wet2F** to overlay a new wet2F spectrum. Repeat as necessary.
4. Select **+Overlay Mode Off** to turn off the plot overlay.
5. Select **+Export Curves** to export currently displayed plots to a text file for email or to an Excel file for diagnosis.

# 4 Troubleshooting

This section presents recommendations and solutions to common problems. Refer to Table A–1 for solutions to frequently asked questions before contacting Endress+Hauser for service; refer to "Service" for further assistance.

| Symptom | Response |
|---|---|
| No connection from AMS100 to analyzer (alarm display in red bar on screen) | Check all hardware connections to the computer and analyzer. |
| | Check AMS settings (e.g., baud rate, IP address, etc.) |
| | Close all Telnet programs, as these may cause interference. |
| | Restart AMS100. |
| | Restart laptop. |
| | Check HyperTerminal or other Telnet program connected to the analyzer that may cause interference. |
| Serial output is displaying garbled data | Contact Service for information. |
| Serial output is providing no data | Contact Service for information. |

## 4.1 Service

If the troubleshooting solutions found in **Error! Reference source not found.** do not resolve the issue, contact Technical Service. Refer to our website for the list of local sales channels in your area (www.endress.com).

## 4.2 Disclaimers

Endress+Hauser accepts no responsibility for consequential damages arising from the use of this software.

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