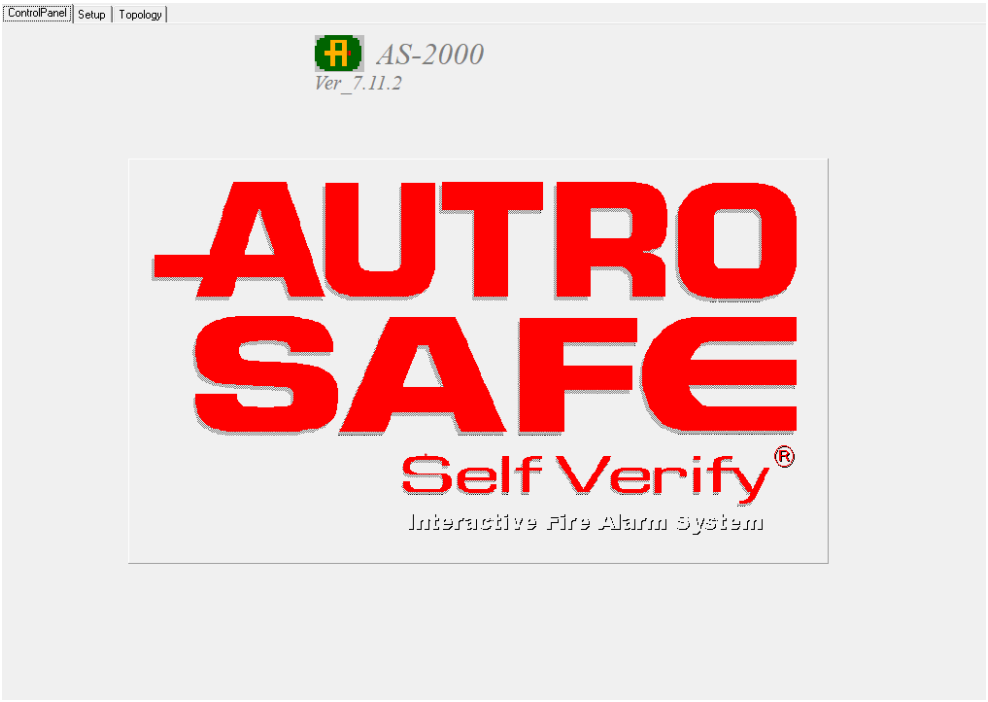

LOOP DIAGNOSTIC TOOL AS2000

USER GUIDE

Doc-1004256-6, 2026-02-23

MADE IN NORWAY

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Chapter 1. Introduction

1.1. About the handbook

This handbook is intended to provide all necessary information for the operation of the Loop Diagnostic Tool AS2000, used for interactive fire detection systems (AutroSafe and Autroprime).

1.2. The reader

The handbook is intended to be used by Autronica Fire and Security service and technical personnel who are responsible for the installation and verification of detection loops.

1.3. Reference documentation

Reference documentation comprises the technical marketing documentation for interactive fire detection systems (AutroSafe and Autroprime).

Chapter 2. General description

AS2000 is a PC-based installation/service and marketing tool, running under Microsoft Windows. AS2000 includes the following main features:

- Graphical topology view of all loop units in one loop. Presents loop with branch-off (one level), loop break position, loop short-circuit position, and individual graphical symbols for all loop units.
- Measuring facilities for finding a loop's total resistance, current consumption, and voltage drop.
- Possibility to find breaks in loop wire, both in positive and negative wire.
- LED test and SV test.
- Graphical view of SMV curves of four selectable detectors and SMV bar graphs for all detectors on a loop.
- Upgrade functionality for AutroGuard firmware.

AS2000 can be run when connected directly to an AutroSafe operating panel, or standalone connected to the loop (AutroSafe or Autroprime) by means of an external interface unit, WAS-2000.

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Chapter 3. Set up the system

3.1. Minimum PC requirements

- Intel 486 DX 100 MHz or higher, when not using the SMVCurves feature
- Intel Pentium 133 MHz or higher, using all available features
- Windows 7 or newer
- 32 Mb of RAM is recommended
- Monitor with resolution of 1024 x 768 HiColor (16 bit) is recommended
- Mouse or another pointing device

3.2. Install the software

The AS2000 software is delivered in different variants, which are available for download from Autronica's product web:

- `AS2000_<version>.exe` is a stand-alone executable file of the AS2000 tool.
- `AS2000_<version>_Installer_<FW-version>.exe` is an installer package that contains the AS2000 tool plus the firmware to upgrade specific AutroGuard units. See *Chapter 7, Upgrade AutroGuard firmware* for instructions on how to run the upgrade.

To run the stand-alone executable file:

1. Store the executable file in any folder/directory you want.
2. Optionally, create a shortcut to the file by dragging the file from the Windows Explorer to your desktop.

To install from the installer package:

1. Store the installer package in any folder/directory you want.
2. Double-click the file and follow the instructions to accept the license agreement and set up the tool.
   Choose where to install the tool and whether to create a desktop icon.
   You can also select to directly launch the tool after installation.
3. After installation, you can delete the installer package.

3.3. Install the hardware (AutroSafe operating panel)

AS2000 can be run when connected to an AutroSafe operating panel (Fire Alarm Control Panel), or standalone connected to the loop (AutroSafe or Autroprime) with an external interface unit.

This section describes the hardware setup when connected to an AutroSafe operating panel.

For instructions on connecting with an external interface unit, see *Section 3.4, "Install the hardware (WAS-2000 interface unit)"*.

3.3.1. Overview

To connect AS2000 to an AutroSafe operating panel, one of the serial ports on the computer must be

connected to the *Communication Module* in the operating panel.

You can then communicate with any loop that is connected to a Loop Driver Module BSD-310 / BSD-311 in the panel.

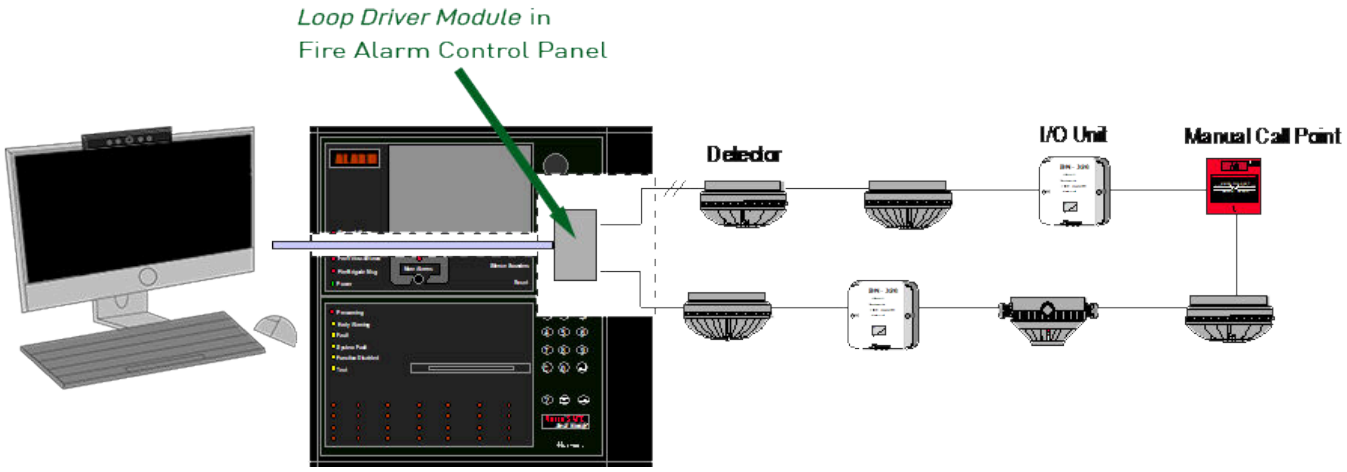


Figure 1. Connect AS2000 to an AutroSafe operating panel

3.3.2. Cable connections to an AutroSafe operating panel

To connect your computer to the Communication Module BSL-310 inside an operating panel:

1. Disconnect the ribbon cable that is already connected to the Communication Module BSL-310.

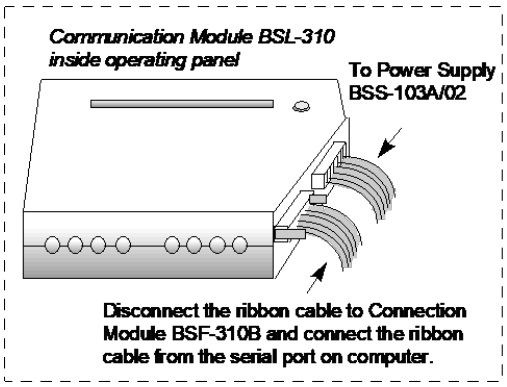


Figure 2. Disconnect Communication Module BSL-310

> To avoid activating the internal buzzer when disconnecting the ribbon cable from the Communication Module BSL-310, turn the power OFF before disconnecting the ribbon cable. When you have connected the external ribbon cable from the computer, turn the power ON.

2. Connect the 9-pin Desub connector of a connection cable (116-XJA-207) to a serial port on your computer, and the other end of the cable to the Communication Module inside the operating panel.

No further connections are needed, since all power connections to the Power Module BSS-310 are already

done inside the panel, and the Loop Driver Modules BSD-310 / BSD-311 are already connected to the loops.

3.4. Install the hardware (WAS-2000 interface unit)

AS2000 can be run when connected to an AutroSafe operating panel (Fire Alarm Control Panel), or standalone connected to the loop (AutroSafe or Autroprime) with an external interface unit.

This section describes the hardware setup when connecting with an external interface unit.

For instructions on connecting to an AutroSafe operating panel, see *Section 3.3, "Install the hardware (AutroSafe operating panel)"*.

3.4.1. Overview

The external interface unit WAS-2000 is a complete hardware toolbox for testing AutroSafe or Autroprime loops without using an AutroSafe operating panel.

It consists of a Power Module BSS-310, a Communication Module BSL-310, and a Loop Driver Module BSD-310. These modules are always included in an operating panel.

You can connect the Loop Driver Module BSD-310 to the loop you want to communicate with.

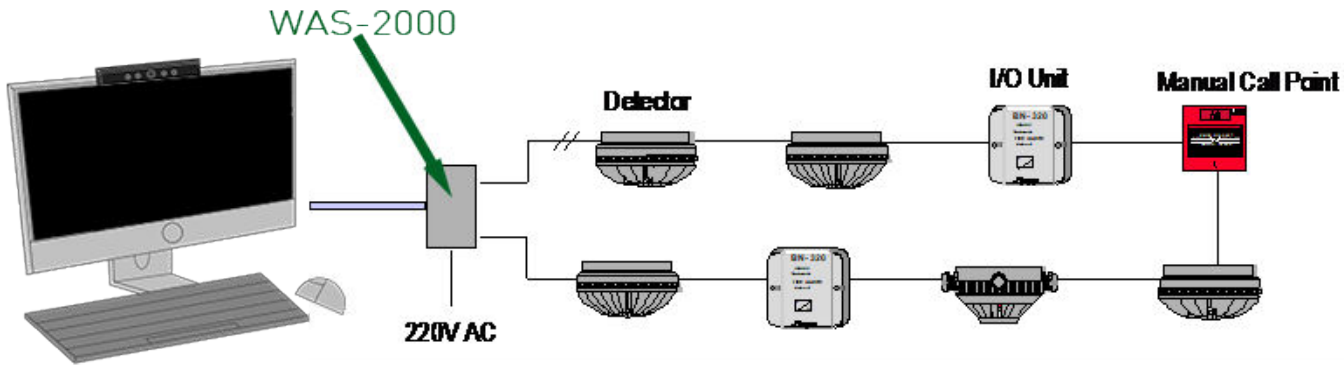


Figure 3. Connect the external interface unit WAS-2000

3.4.2. Cable connections within WAS-2000 interface unit

The following drawing illustrates the cable connections in a WAS-2000 model that includes a battery, but no power supply:

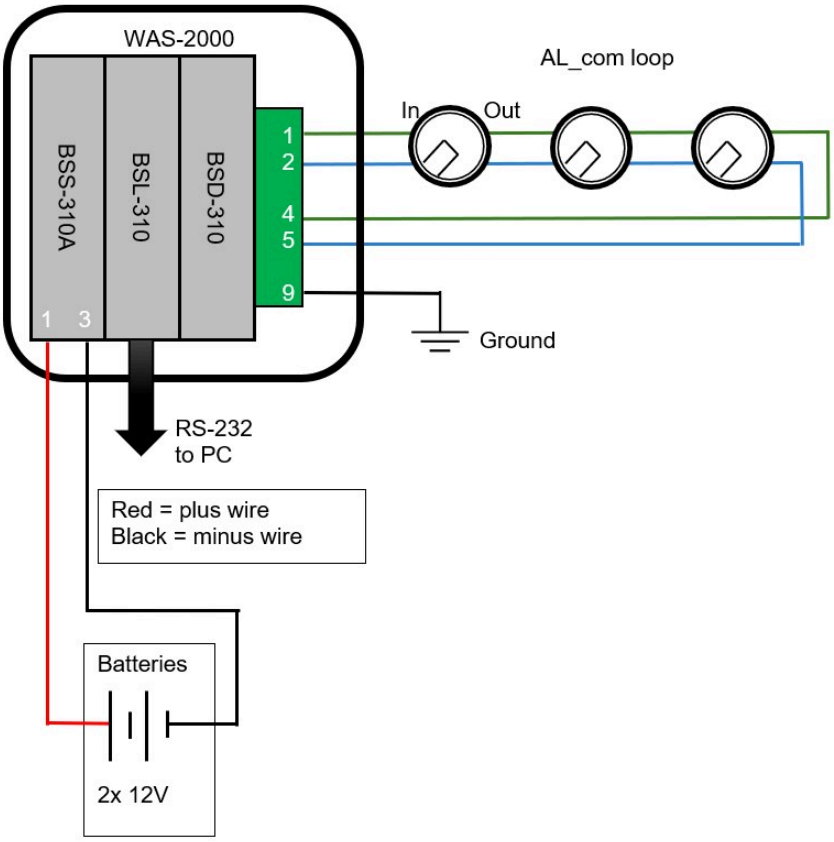


Figure 4. Cable connections within WAS-2000 interface unit

When using this model, the batteries must be fully charged before starting a loop scan.

The following drawing illustrates the cable connections in a WAS-2000 model that includes a power supply:

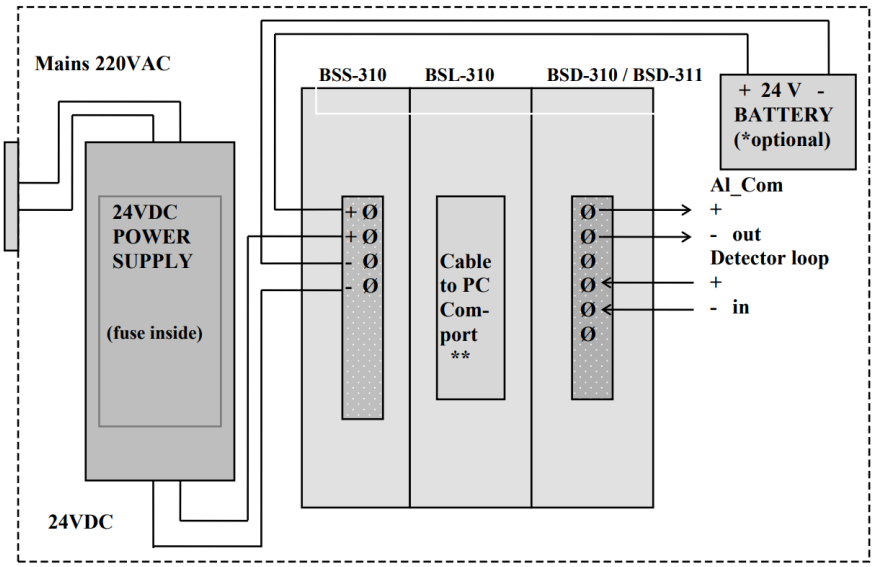


Figure 5. Cable connections in a WAS-2000 model

If a battery is installed in this model, disconnect it when not in use, to avoid discharge.

The following drawing illustrates any of the installed modules.

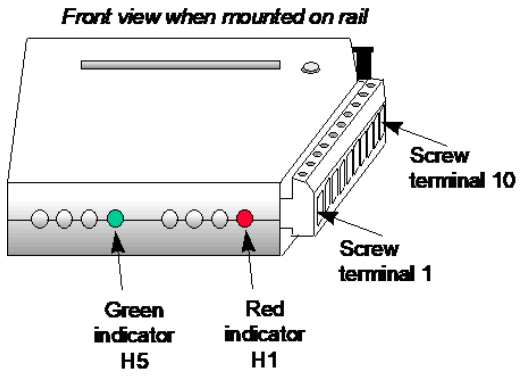


Figure 6. Installed module

3.4.3. Cable connections to WAS-2000 interface unit

To connect the WAS-2000 interface unit to your computer and the loop you want to test:

1. Connect the 9-pin Desub connector of the cable that is connected to the Communication Module BSL-310 to a serial port on your computer.
2. Connect the Loop Module BSD-310 to the loop that you want to communicate with:

Screw Terminal no. on Loop Driver Module BSD-310	Signal
1	OUT
2	OUT -
3	CHASSIS
4	IN
5	IN -
6	CHASSIS

Table 1. Loop Module BSD-310 connections

3. Connect the WAS-2000 interface unit to 220 V AC power.

Chapter 4. Start the tool

To start AS2000, double-click the desktop icon or the executable file (see *Section 3.2, "Install the software"*).

The tool will then prompt you for the COM port to which you connected the operating panel or interface unit.

If you select an invalid COM port, the tool will show an error message. You can then select a different port by clicking the **[Open COM-port]** button on the **Topology** tab.

The tool will automatically start logging and inform you of the location of the log files.

4.1. Enter access levels

By default, AS2000 will start at access level "Basic". The access level determines the privileges of the user, and which operations are available.

To switch to a different access level, click the **[Enter New Access Level]** button on the **Setup** tab. You are then prompted for a password. The correct password will give you access to more advanced functionality.

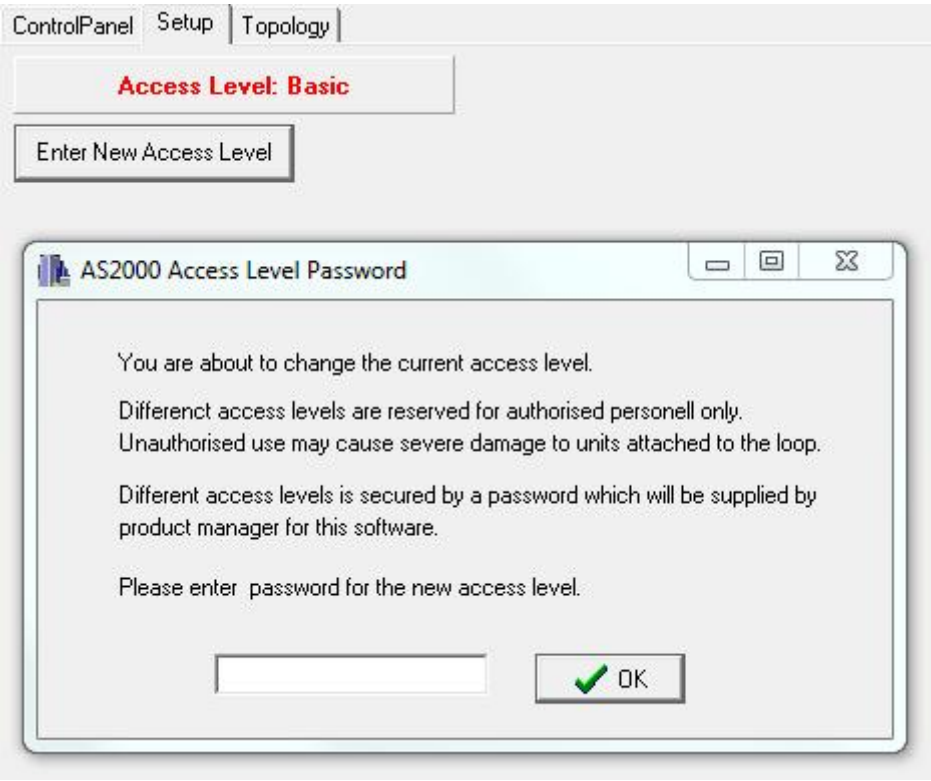


Figure 7. Switch access level

After the first start, the access level (and other user-specific information) is stored in a configuration file in the following folder: `%APPDATA%\AS2000\`

4.2. Configure the tool

Depending on the access level (see *Section 4.1, "Enter access levels"*), the **Setup** tab offers various configuration options. For example, in access level "Service" you can configure logging, which information should be displayed, and what timeout should apply when reading parameters from a loop unit.

Note that the available options might differ for different versions of the tool.

Figure 8. Configuration options

Chapter 5. View the loop topology

The **Topology** tab is the first view most users will access to see a graphical representation of the detection loop.

Note that before AS2000 has scanned the loop and presented it on the **Topology** tab, most of the AS2000 commands are not available.

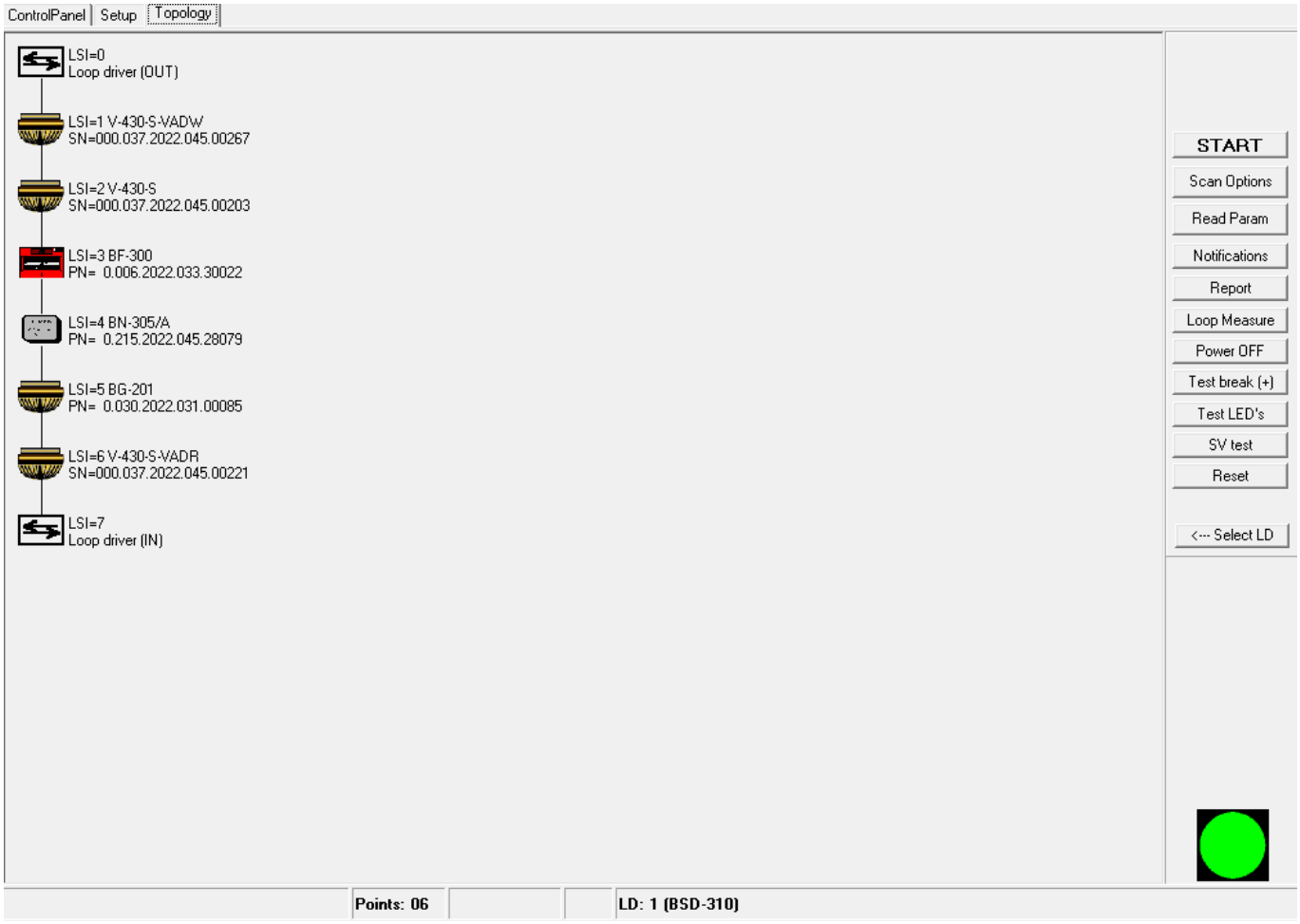
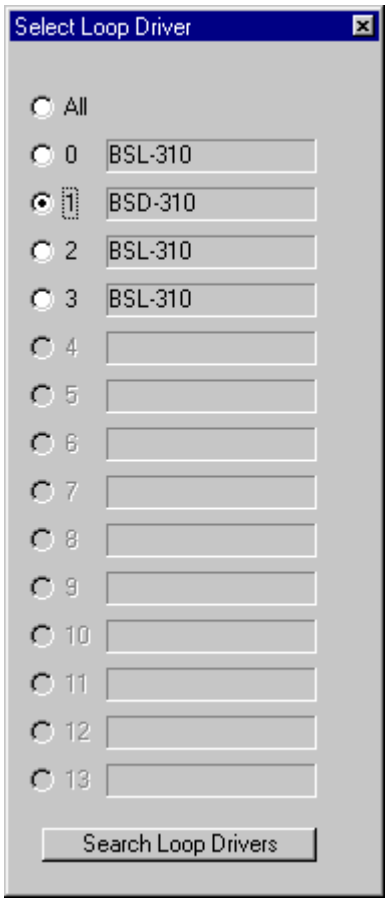


Figure 9. Loop topology

5.1. Select the loop driver



If there are several loop drivers or other modules connected to AS2000, you must select the one to communicate with. This is mostly relevant if you have several Loop Driver Modules (BSD-310 / BSD-311), but you can also select other modules (for example, Communication Module BSL-310 or Output Module BSJ-310) to communicate with.

By default, loop driver 1 (LD1) is selected, which is the Loop Driver Module in the WAS-2000 interface unit.

To update the list of available loop drivers, click the **[Search Loop Drivers]** button.

After scanning the loop (see *Section 5.2, "Scan the loop"*), a graphical presentation of the selected module will appear. The examples below show two different presentations.

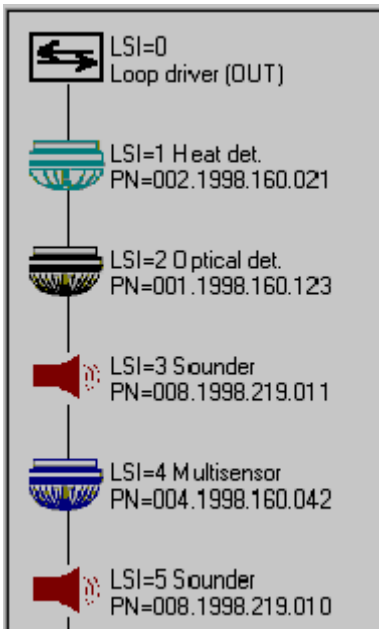


Figure 10. Example: Loop Driver Module BSD-310 has been selected

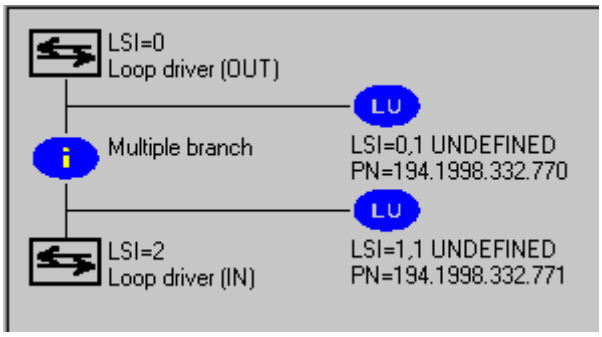


Figure 11. Example: Communication Module BSL-310 has been selected

As shown in the example, AS2000 is not able to present the topology for the modules BSL/BSB/BSJ-310.

5.2. Scan the loop

START To see a graphical representation of the loop topology in a correct electrical sequence, you must scan the loop.

The scanning of loop units is split into two logical phases, which are visible underneath the **Busy!** message in the upper right corner of the window while the loop is being scanned:

- The first phase is "Scanning topology", in which AS2000 finds all units physically connected to the detection loop.
- The second phase is "Reading parameters" from the loop units. The status bar at the bottom of the window shows what kind of data is being retrieved.

To scan the loop:

1. Check and configure the scan options (see *Section 5.2.1, "Configure scan options"*).

   Make sure to check the scan options if the detection loop is connected to an AutroKeeper BN-180.

2. Click the **[START]** button.
   The current loop scan options are displayed for a few seconds.

   When AS2000 starts searching for loop units, the **[START]** button changes to a **[STOP]** button. A steady red circle ("traffic light") is shown in the lower right corner.
3. Observe that when all loop units have been detected, the red circle switches to yellow, meaning that AS2000 now reads parameters from the loop units.
   The **[STOP]** button is disabled in this stage. It switches back to **[START]** when the parameters are read.

   Each time AS2000 finds something irregular, it will beep, and in some cases terminate the topology scan with an error message.

   You can repeat this step by clicking the **[Read Param]** button.

4. When the topology scan is finished, AS2000 tests for break in the positive wire. If there is a break, the position can be located automatically. This will take less than 20 seconds.
5. If you are running an AS2000 installer package that includes a firmware upgrade, you will be prompted to upgrade the firmware of the AutroGuard units on the loop after the loop has been scanned. See *Chapter 7, Upgrade AutroGuard firmware*.

After the loop has been scanned, the **Topology** tab displays a graphical presentation. Points are presented with unique symbols for each type, and with important information such as the production number (PN) and the loop sequence index (LSI). In case of illegal topologies, like multiple branch-off and loop break, these will be presented with self-explaining symbols. For a complete list of available symbols, see *Chapter 9, List of symbols*.

5.2.1. Configure scan options

Click **[Scan Options]** to configure how the loop is scanned.

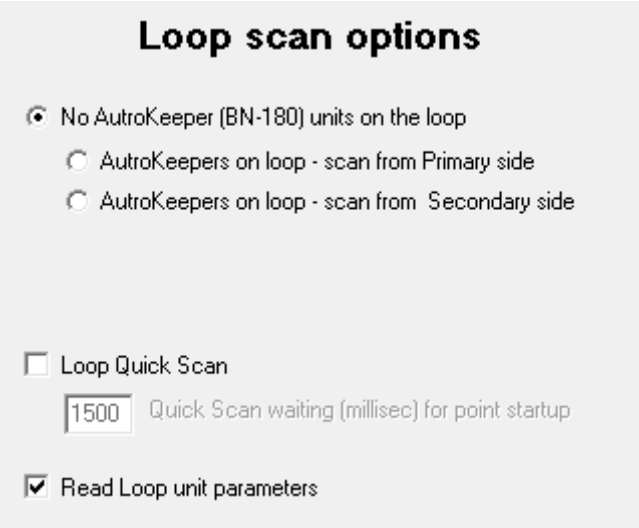


Figure 12. Loop scan options

The content of the Loop scan options depends on the version of AS2000 and the current access level.

Before starting the loop scan, you must specify whether any **AutroKeeper BN-180 units** (required for Dual Safety systems) are present on the loop. If there are, choose whether the detection loop belongs to the primary or the secondary system (defined in the specific configuration):

- If the detection loop in question belongs to the primary system, select "AutroKeepers on loop – scan from Primary side".
- If the detection loop in question belongs to the secondary system, select "AutroKeepers on loop – scan from Secondary side".

Loop quick scan can be set to increase the AS2000 speed on detecting units.

The value can be set as low as 900 ms. However, if the value is set too low, a false loop break might be presented due to some units starting up too slowly. If you suspect such problems, try setting the value to 3000 ms and perform a new loop scan. The default value (when **Loop quick scan** is not selected) is 2000 ms.

If BN-180 units are present, the **Loop quick scan** value should not be set lower than 1200 ms.

After the topology scan has completed and been presented to the operator, AS2000 will start reading loop unit parameters. Depending on the number of loop units, this can take a while.

You can unselect **Read loop unit parameters** if you don't need the loop parameters. Note that in this case, AS2000 will have insufficient data to generate a complete report, since loop unit parameters have not been retrieved.

5.2.2. Stop the scan

While the loop is being scanned, you can click the **[STOP]** button to force AS2000 to stop the topology scan. When this button is pressed, the topology presented on screen might be incorrect. To clear all points and start powering up from the beginning, click **[START]** again.

The **[STOP]** button is available while AS2000 is searching for loop units. When all units have been detected, the **[STOP]** button is temporarily disabled until the mandatory part of reading loop unit parameters has been completed. When all broadcast reading of unit parameters and the following individual read of point configurations has completed, the **[STOP]** button switches back to the **[START]** button.

Chapter 6. Work with the loop

After the loop has been scanned and its topology is visible, you can interact with it. For example, you can inspect the loop and the loop units, interact with the loop units, generate reports, and run tests.

6.1. View information

The fields in the status bar at the bottom of the screen gives the following information, from left to right:

- AS2000 status: Gives the status of AS2000 and states whether input is expected from the user.
- Points: The total number of points.
- Earth failure on + and - wire (if present).
- The chosen Loop Driver module (BSD-310) or other module (for example, the Communication Module BSL-310 or Output Module BSJ-310).

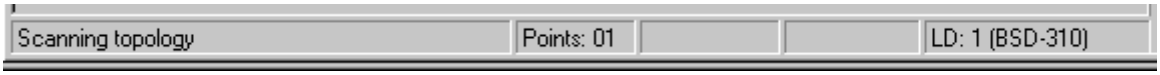


Figure 13. Status bar

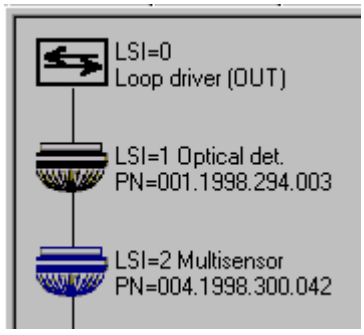
6.1.1. View notifications

All important messages and notifications from the AS2000 tool and the loop units appear in the AS2000 notification log.

The log contains time stamps. You can copy and paste the displayed information as plain text if you want to keep it.

The notification log is displayed in a popup window that opens automatically when you start AS2000. If you close the window, it will not re-open automatically when it receives new events. To open it again, click the **[Notifications]** button on the **Topology** tab.

6.2. Inspect and act on loop units



In the topology view, you can inspect information about loop units and perform actions on them.

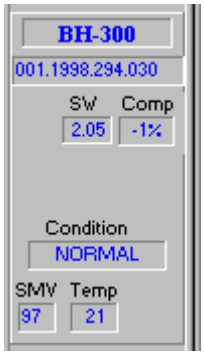
To do so, point your mouse at the icon of the loop unit (not the text describing the unit).

6.2.1. View information about a loop unit

When pointing on a loop unit on the **Topology** tab, a hand symbol appears, and *static* information related to this unit is shown in a field in the bar on the right.

Left-clicking the mouse while pointing on a loop unit displays *dynamic* information related to this unit (thus information applicable at the moment, for example, the current temperature). To retrieve this information, AS2000 communicates with the selected point.

The displayed information depends on the point type and your access level.



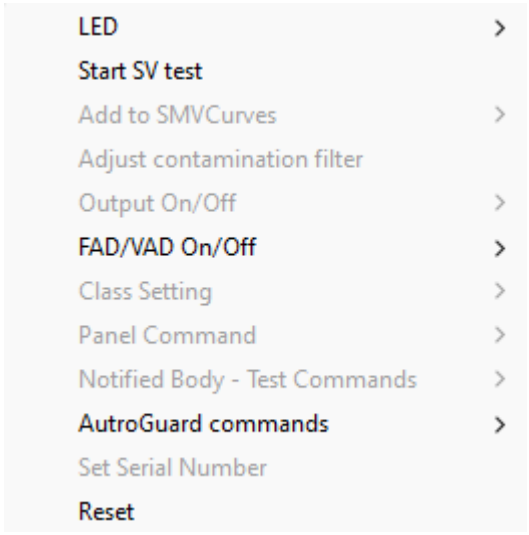
Static information:

- Loop unit type
- Production number
- SW: Software
- Comp: Grade of compensation for pollution (optical detectors, multisensors)

Dynamic information:

- Condition: normal (quiescent), alarm, fault, test, disablement, fault warning (prealarm)
- SMV: Standard measure value
- Temp: Temperature

6.2.2. Perform actions on a loop unit



Right-click on a loop unit to display a popup-menu (like the one on the left) with actions you can execute at the specific point that is selected. Available commands vary depending on the point type and the access level.

Some of the available commands are described in the following sections.

6.2.2.1. LED

Access level: Basic

Turn on or off the LED-indicator on a point. Only one LED on the loop will be on at the same time, so when you choose to turn a LED on, AS2000 automatically turns off all other LEDs.

6.2.2.2. Start SV test

Access level: Basic

Run a SelfVerify test on this specific point. See *Section 6.6.2, "Run a SelfVerify test"* for more information.

6.2.2.3. Add to SMVCurves

Access level: Service

Select a point for the **SMV_Curves** tab. On the **SMV_Curves** tab, up to four curves can be presented at the same time, so you must select which one of these four to associate with the selected point.

6.2.2.4. Adjust contamination filter

Access level: Service
Available for: optical detector, multisensor detector

Adjust the contamination compensation for a detector. Perform this action after cleaning the optical chamber to avoid the detector signal being too high or low, depending on the type of dust that has been removed. The detector will also adjust itself without performing this action, but it might take some weeks.

It is important that the chamber is properly dried out before performing this action, and that the detector does not have any abnormal environmental condition.

When performing the action, AS2000 communicates with the detector to get the actual contamination setting/values and displays the result:

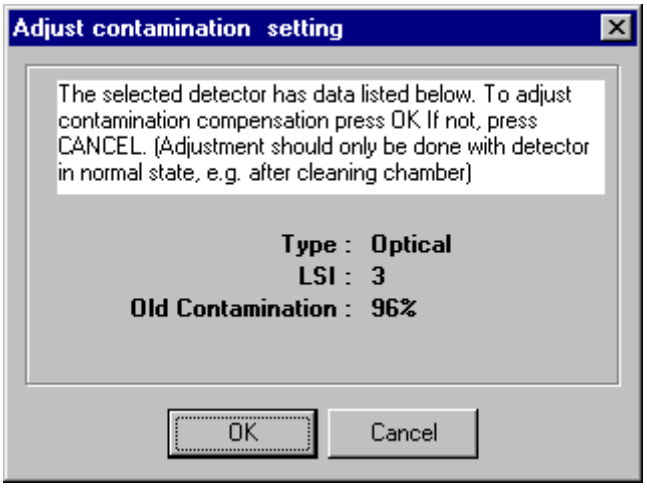


Figure 14. Adjust contamination setting

Click OK to start the adjustment of the contamination filter. When the adjustment is completed, a new window shows the result:

Figure 15. Contamination adjustment completed

The new compensation value set in the detector is shown in red text. Do not expect this value to be absolute zero.

6.2.2.5. Output On/Off

Access level: Basic
Available for: multifunction IO units BN-303, BN-304, BN-305, BN-308

Switch the output (or outputs) on or off.

6.2.2.6. FAD/VAD On/Off

Access level: Basic

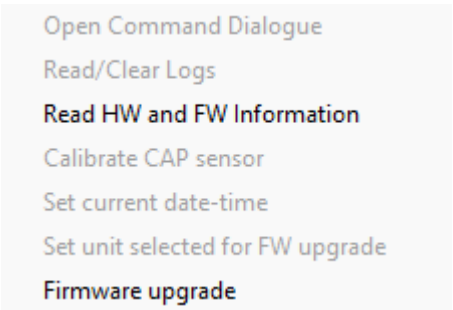
Test a FAD or VAD by turning it on or off.

6.2.2.7. Reset

Access level: Basic

Reset the point.

6.2.3. Run AutroGuard commands



AutroGuard units have a separate set of commands that you can run. These commands are available under the **AutroGuard commands** entry in the right-click menu. Available commands vary depending on the access level.

Some of the available commands are described in the following sections.

6.2.3.1. Read/Clear Logs

Access level: Service

Open a window that allows reading or clearing the internal AutroGuard logs.

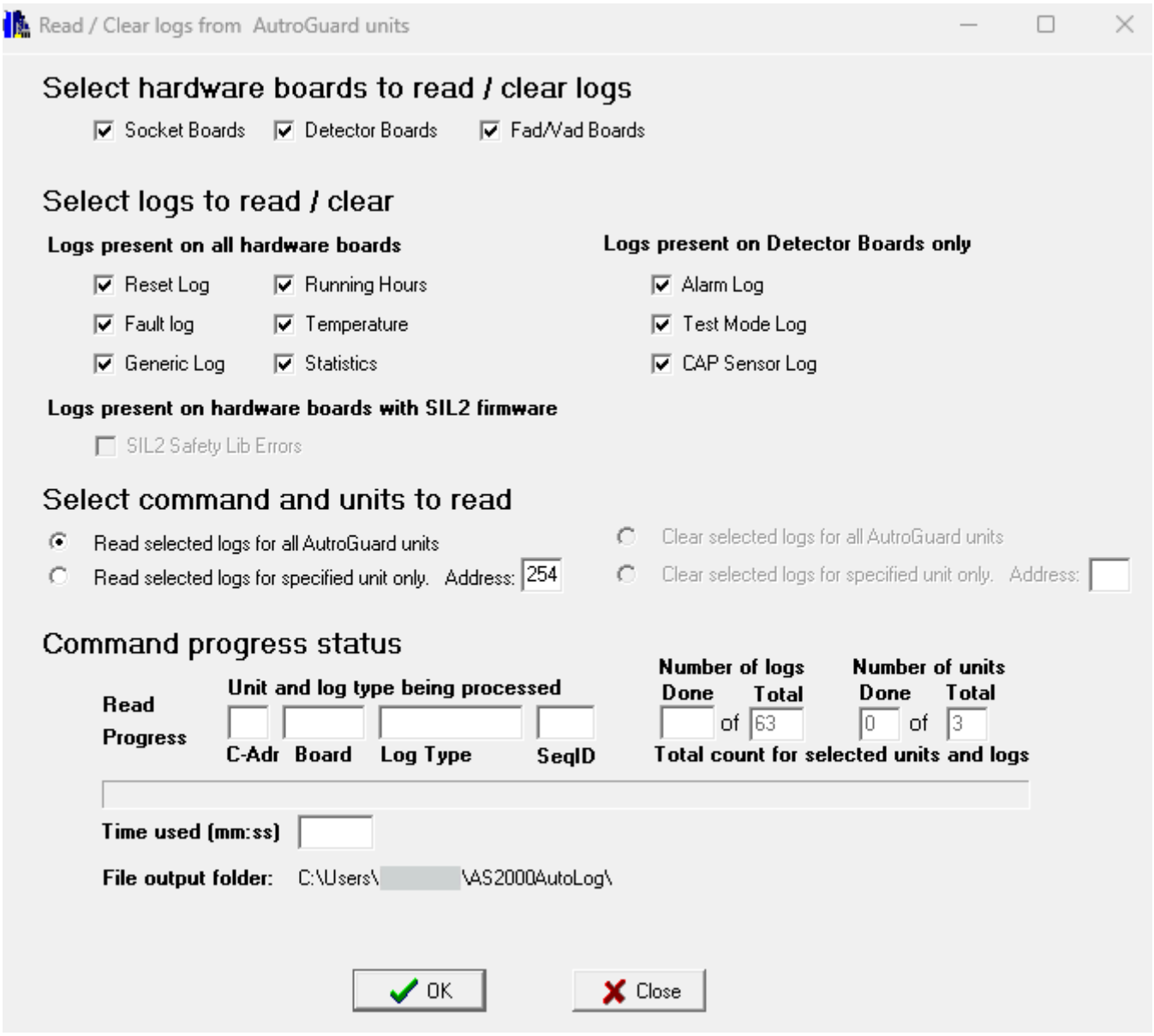


Figure 16. Read/Clear logs from AutroGuard units

The command can be applied to all AutroGuard units or to a single AutroGuard unit (specified by its C-address). Note that it isn't possible to clear logs that are currently in use.

The log data read from AutroGuard units is stored on your PC. The folder location is visible in the command window.

Be careful when clearing log data. It cannot be recovered.

6.2.3.2. Read HW and FW Information

Access level: Basic

Generate a file that shows the hardware and firmware version for all AutroGuard units on the loop.

The file is stored in the following folder: `%HOMEPATH%\AS2000AutoLog\`

6.2.3.3. Set current date-time

Access level: Service

Set the date and time for a loop unit.

This is done automatically when the loop is scanned. However, if a unit is disconnected from power, its date and time are lost, and you can use this command to manually set it again.

6.2.3.4. Set unit selected for FW upgrade

Access level: Service

Select a single unit or address for upgrading.

6.2.3.5. Firmware upgrade

Access level: Basic

Open the **AutroGuard FW Upgrade** window that allows updating the AutroGuard units with new firmware. See *Chapter 7, Upgrade AutroGuard firmware* for more information.

This operation shall only be done by authorized personnel with proper training.

6.3. Generate a report

To view and save a report with useful information about the selected loop, click the **[Report]** button.

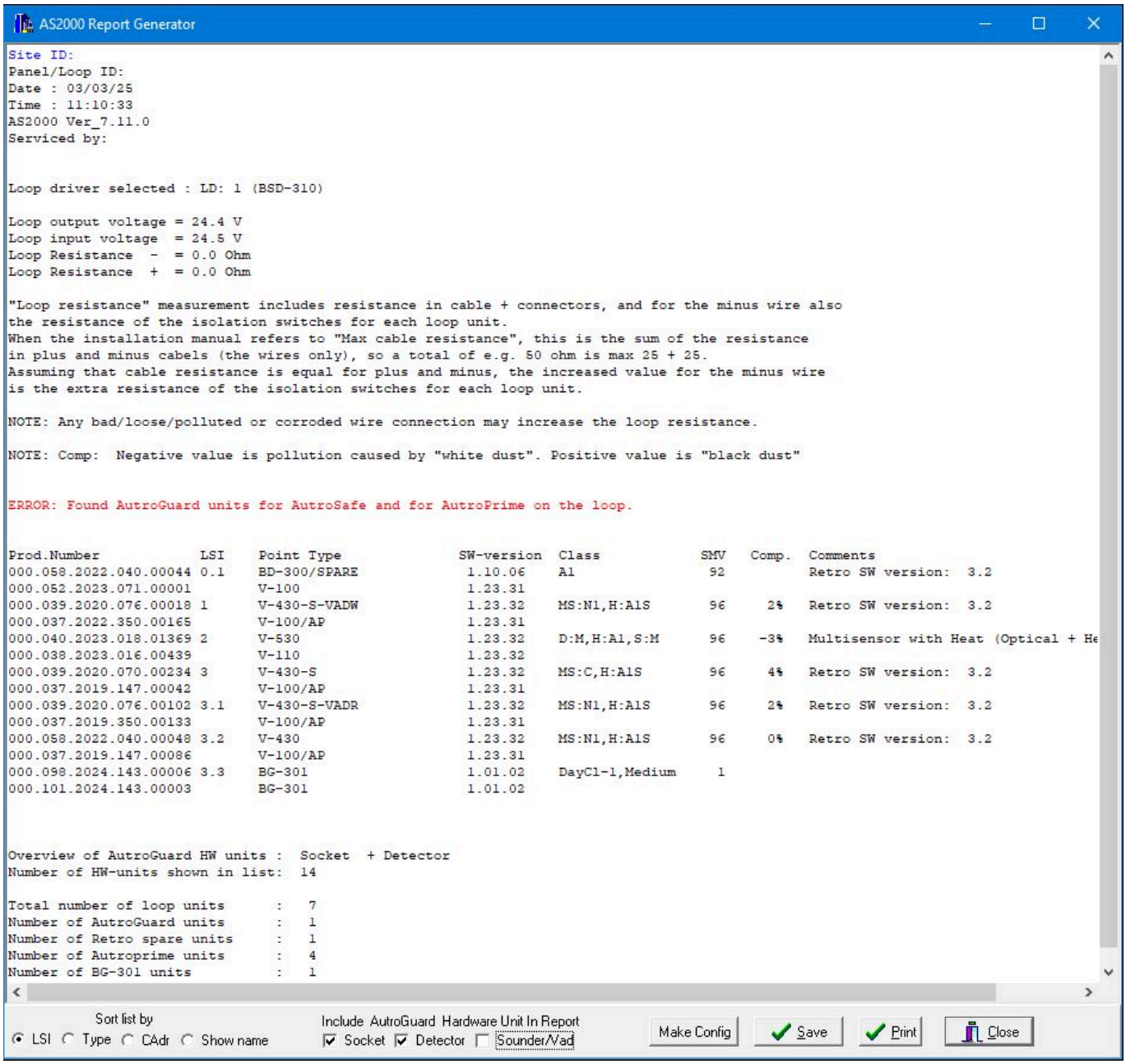


Figure 17. AS2000 Report Generator

Note that the report feature is not available until the loop unit parameters have been retrieved.

In the configuration options at the bottom of the report window, you can sort the loop units by loop sequence index (LSI), point type, or C-address. The “Show name” option sorts by LSI, but will show a descriptive name for the unit instead of the unit type name.

If AutroGuard units are present, you can choose which parts of the AutroGuard unit should be included in the report.

6.3.1. Generate configuration for AutroSafe

You can generate an Excel CSV file from the loop report, which the AutroSafe Configuration Tool can convert to AutroConfig format.

To do so, click the **[Make Config]** button in the report window.

If any AutroGuard unit is found on the loop, you must choose whether to use the detector or the socket information in the exported CSV file. The default option (if the generated file is to be imported in the AutroSafe configuration tool) is to use the detector type name and serial number, but you can choose to use the socket type name and serial number instead.

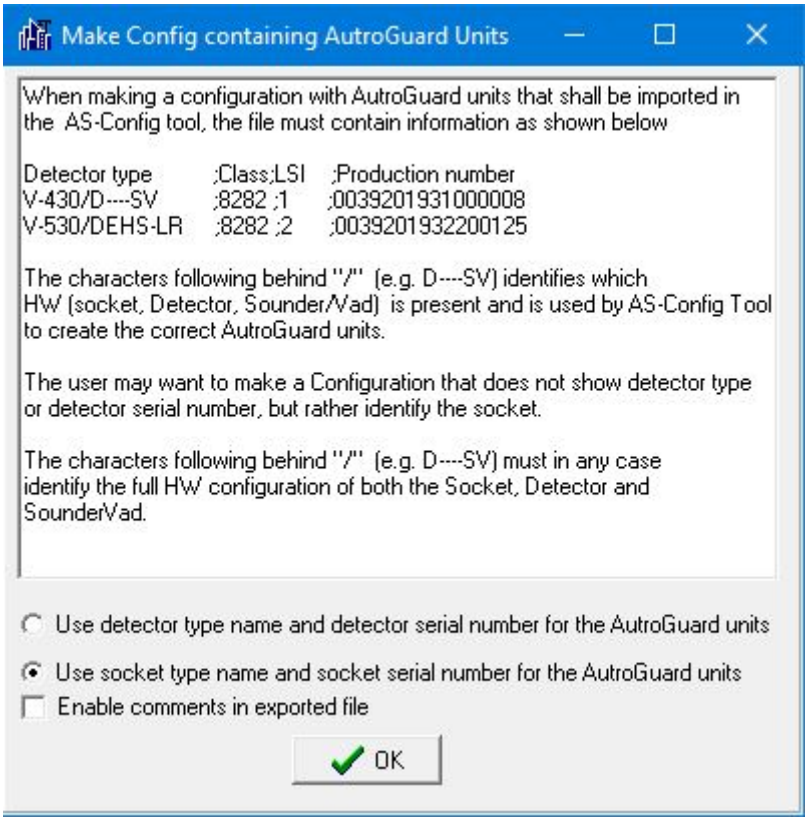


Figure 18. Generate configuration

6.4. Measure loop resistance

To measure the loop resistance, current consumption, and loop voltages of the selected loop driver, click the **[Loop Measure]** button.

You can use this information to check the loop condition. Note, however, that the current and resistance measuring is not very exact and should only be used as a guiding result.

If the loop is not closed, the resistance will be presented as an Open Loop.

The result is displayed in a dialog box:

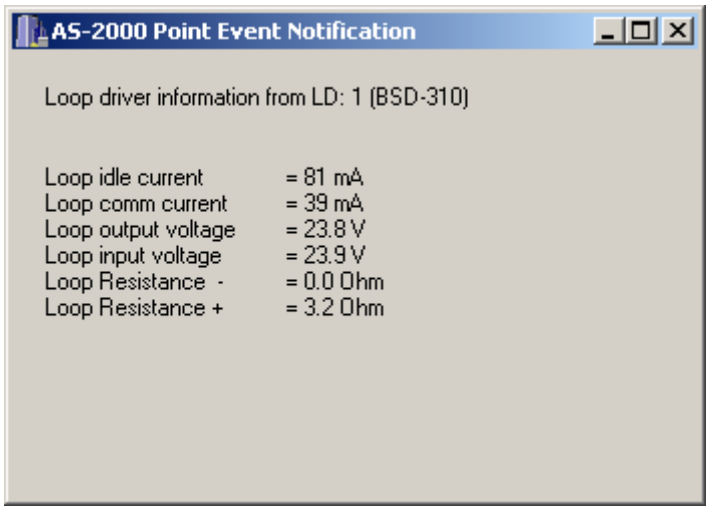


Figure 19. Point event notification

6.5. Power off the loop

Power OFF The **[Power OFF]** button turns off the loop power at both sides of the selected loop driver.

6.6. Run tests

The AS2000 tool can run different tests on the loop and the loop units.

6.6.1. Test LEDs

To run an automatic LED test for all points on the loop, click the **[Test LED's]** button.

This brings up the test window, which lets you configure and start the test, as well as displaying the test status:

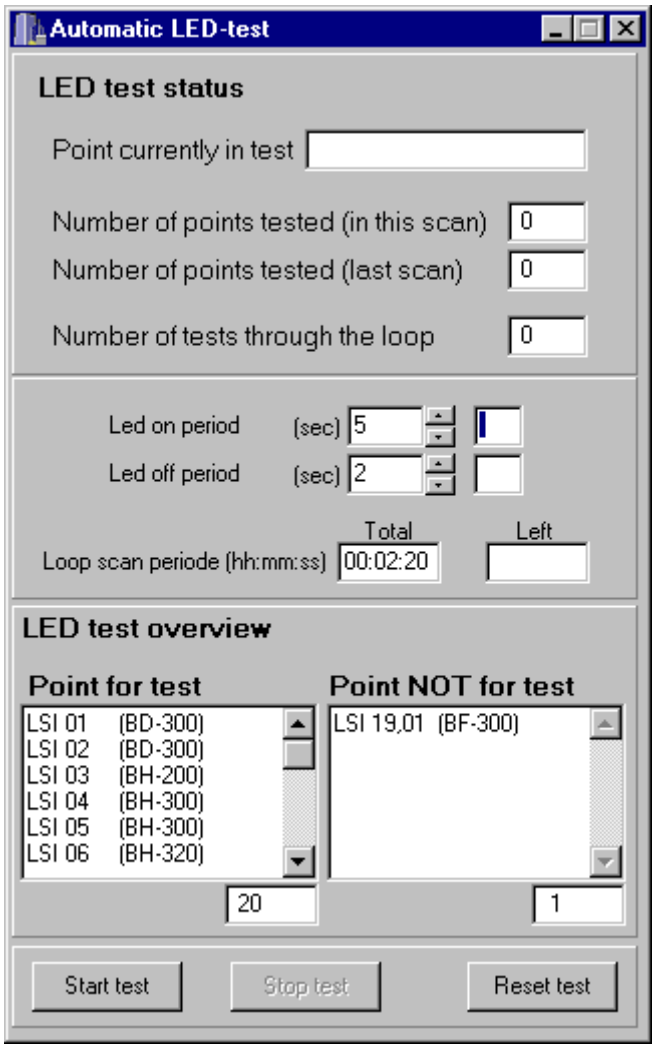


Figure 20. Automatic LED test

When you click **[Start test]**, the test starts with the point at LSI 1 and then selects points on increased LSI values. Branches are selected before continuing on the main loop (for example: 1, 2, 3, 3.1, 3.2, 3.3, 4, 5, ...).

For each point (listed in the "Point currently in test" box), the test turns the LED on for the number of seconds specified in "Led on period". It then turns the LED off for the number of seconds specified in "Led off period", before continuing with the next point in the sequence. You can change the LED on and LED off periods while the test is running.

The "Loop scan period" gives the total time and the time left for testing the whole loop. After all points in the loop are tested, the test starts over, and the "Number of tests through the loop" value is incremented.

The **LED test overview** section lists the points that will be tested and the points that do not have any LEDs.

To start over with the first LSI, click **[Reset test]**.

6.6.2. Run a SelfVerify test

To run a full SelfVerify test for all points on the loop, click **[SV test]**.

This brings up the test window, which lets you start the test and shows the test status. There are no

configuration options for the SelfVerify test.

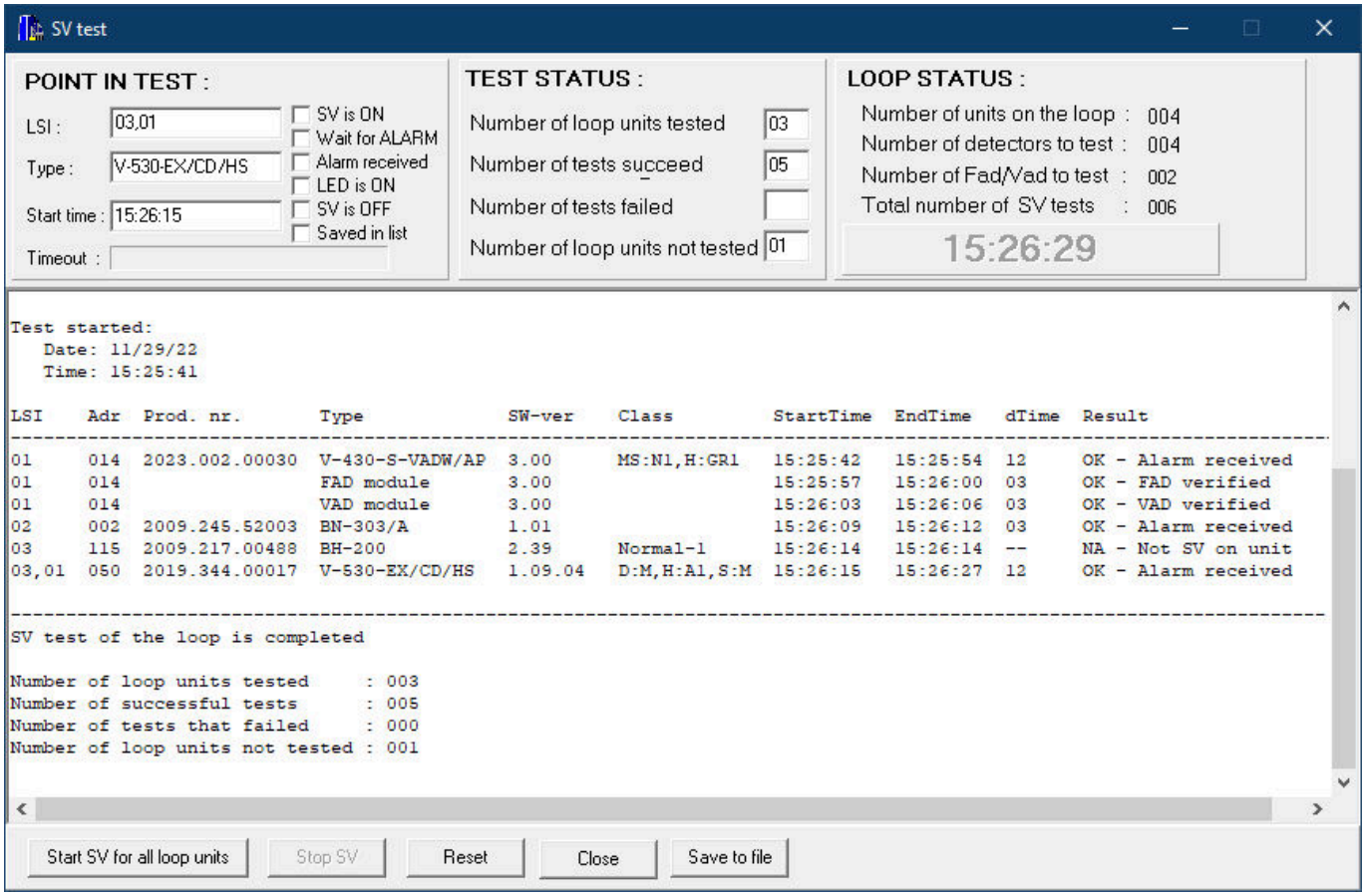


Figure 21. SelfVerify test

When you click **[Start SV for all loop units]**, the test starts with the point at LSI 1 and then selects points on increased LSI values. Branches are selected before continuing on the main loop (for example: 1, 2, 3, 3.1, 3.2, 3.3, 4, 5, ...). Points that do not have SelfVerify are listed as not tested.

The **POINT IN TEST** section shows which tests are currently being run on which point. The timeout progress bar indicates the timeout period for the current command.

The **TEST STATUS** section lists the test status so far in the test, while the **LOOP STATUS** section shows static information about the units on the loop (collected before the test starts).

If you stop the SelfVerify test, it will complete the test for the current point before terminating. To reset the test result and prepare for a new test, click the **[Reset]** button.

You can save the SV test log to a Rich Text file by clicking the **[Save to file]** button.

6.6.3. Test for breaks

To test for a break in the positive wire, click the **[Test break (+)]** button. If a break is found, AS2000 can locate the break.

This test is also performed automatically when clicking the **[START]** button.

Chapter 7. Upgrade AutroGuard firmware

If you are using an AS2000 installer package, you can use AS2000 to upgrade the AutroGuard firmware, or to upgrade Autroprime bases to AutroSafe bases (or the other way around).

AS2000 installer packages include specific firmware upgrades for AutroGuard units. Different installer packages are available for different upgrades. See *Autronica's product web* for a list of available installer packages.

Installer packages target specific devices, for example V-430 or V-530. Other devices are not upgraded. Devices that already have the provided firmware version are ignored.

7.1. Before you start

Firmware upgrades should only be done by authorized personnel with proper training, and if instructed by support to do so.

To upgrade the AutroGuard firmware, you must use an installer package, not the stand-alone executable file of the AS2000 tool. See *Autronica's product web* for a list of available installer packages, and *Section 3.2, "Install the software"* for installation instructions.

7.1.1. Prepare your PC

During the upgrade, do not use your PC for other tasks and make sure it does not go to sleep or run out of battery.

All of these might interrupt the upgrade process.

Before you start the upgrade process, prepare your PC:

- Install the correct installer package for your use case. See *Section 3.2, "Install the software"* for instructions.
  You can install only one installer package at a time.
- Connect the PC to power. Do not run it on batteries.
- Configure your PC to never go to sleep (on Windows 11: **Settings › System › Power & battery › Screen, sleep & hibernate timeouts**).
- Close all other applications on the PC. Applications that use a lot of memory (like Chrome or Teams) can disrupt the communication.

7.1.2. Check the loop

Before you start the upgrade process, check the loop:

- Make sure that the stack used for the upgrade contains only BSS-310A, BSL-310, and BSD-310/311.

- Set any AutroKeeper units on the loop to OFF (dip 2 ON), so that the loop is a normal loop seen from the primary side.
- If possible, fix any breaks in the loop before starting. The loop should be closed when starting the upgrade.

7.2. Upgrade the firmware

The time that each upgrade process takes varies widely between about half an hour and several hours, depending on how many files are used and how many units are on a loop.

7.2.1. Scan the loop

Start by connecting and scanning the loop (see *Section 5.2, "Scan the loop"* for instructions).

After the loop is scanned successfully, you will be prompted to start the upgrade process.

7.2.1.1. AutroSafe and Autroprime bases

If AS2000 finds a mix of Autroprime and AutroSafe bases during the loop scan, it will stop, display an error, and ask whether to continue.

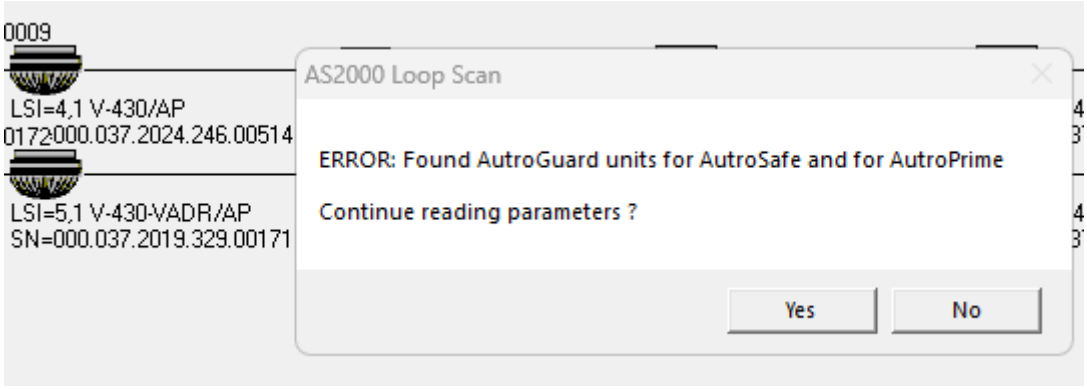


Figure 22. Found AutroSafe and Autroprime bases

This warning pops up to make you aware that you have installed a combination of bases that cannot be used together.

If you know that you have this mix of variants and you still want to upgrade, click **[Yes]** to continue. The tool will make sure all units get the correct files and settings depending on which AS2000 package you are using.

7.2.2. Start the upgrade process

After the loop scan is complete, click **[Yes]** to open the upgrade window.

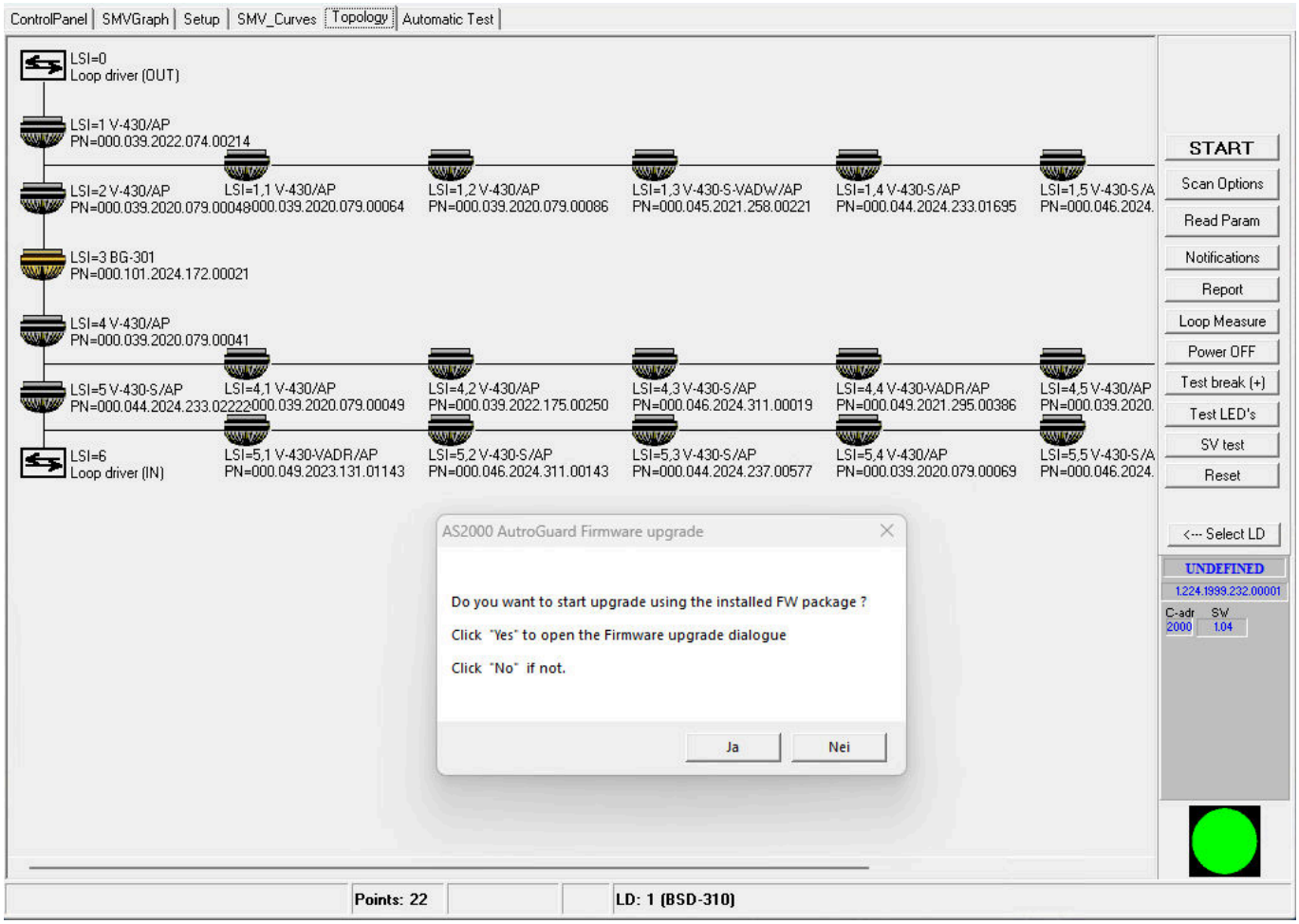


Figure 23. Open the upgrade window

If you click **[No]**, the tool will ask if you want to delete or keep the firmware files:

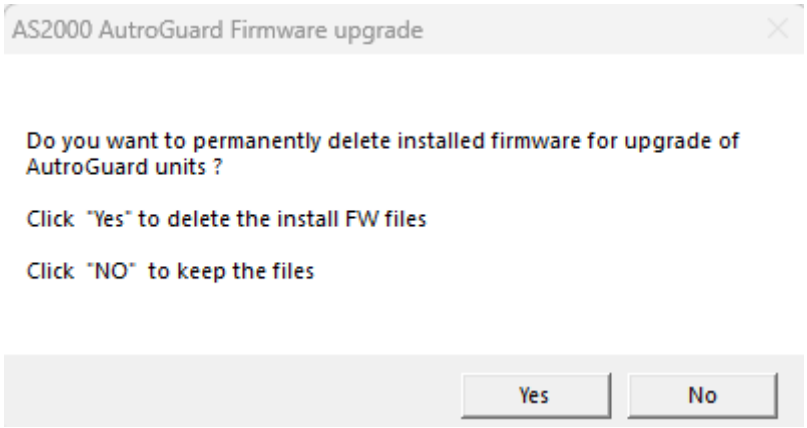


Figure 24. Delete firmware files

If you click **[Yes]** to delete the files, you will need to run the installer again to be able to perform an upgrade. If you click **[No]**, you are still canceling this upgrade, but the upgrade files are kept so you can upgrade more loops from the same PC.

7.2.3. Program the firmware

The firmware upgrade window lists the software versions found on sockets, protectors, and other units. It also counts the number of devices that are started in bootloader mode (such units are displayed with a blue symbol in the topology view).

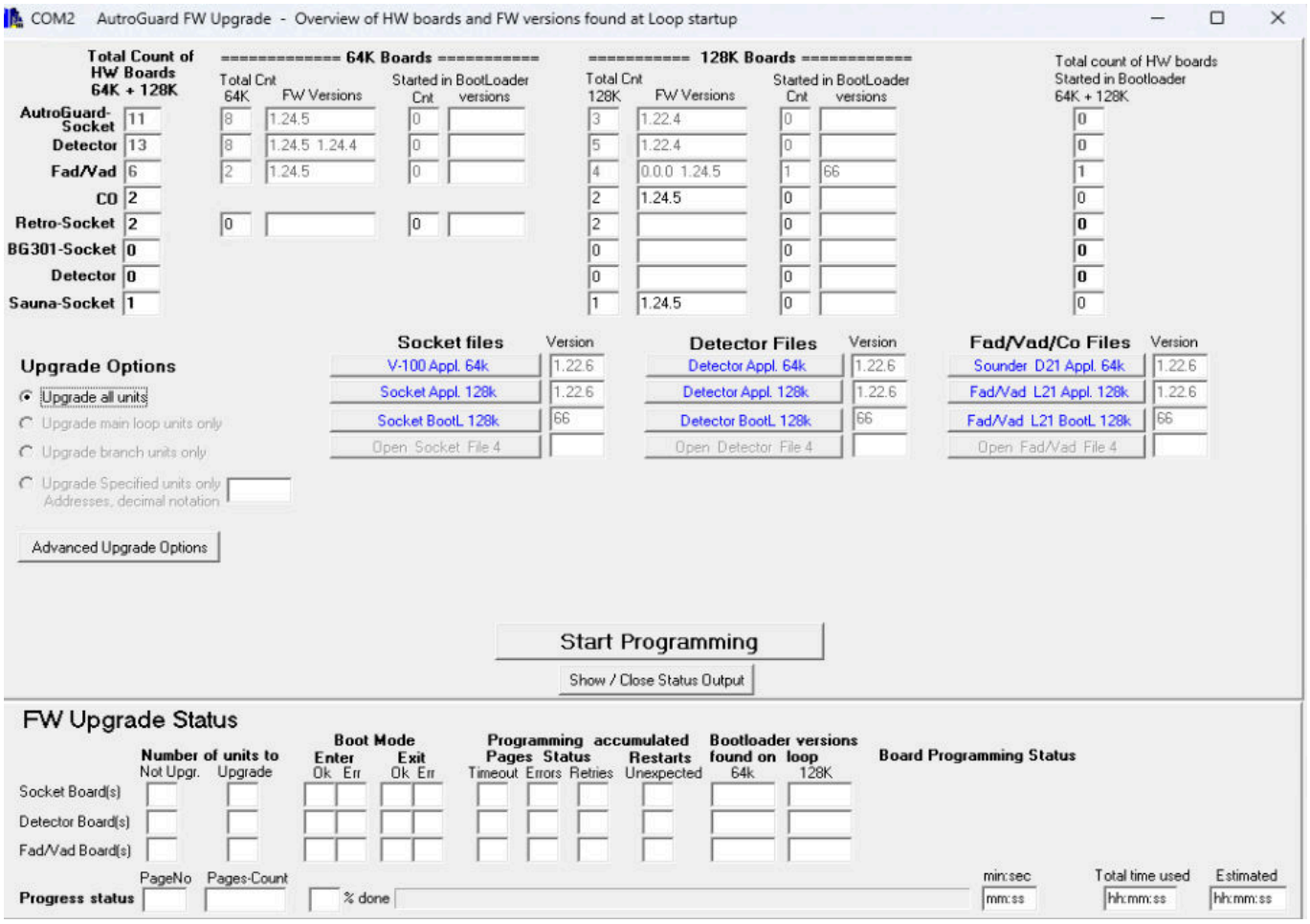


Figure 25. Firmware upgrade window

Depending on which installer package you used, AS2000 will extract the attached firmware files. Wait until the firmware files are unpacked, and then click **[Start Programming]**.

Programming will start, and the estimated time is shown in the bottom right corner. The time is just a rough estimate and might vary depending on how many units are on the loop, the type of loop units, and the loop condition.

7.2.4. Finalize the upgrade

After the upgrade is finished, AS2000 displays the following messages:

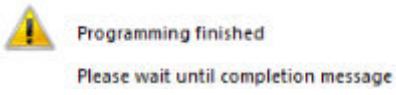


Figure 26. Programming finished

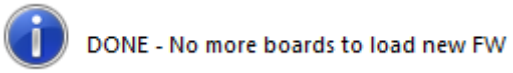


Figure 27. Upgrade finished

The first message indicates that the programming step is finished, but there is still some work to do. Wait until you see the second message before you continue.

Power off the loop and scan it again to check the status of the loop units:

1. Click **[Power OFF]**.
2. Click **[START]** and select **[No]** on all popup windows.
3. Wait for green light in the bottom right.

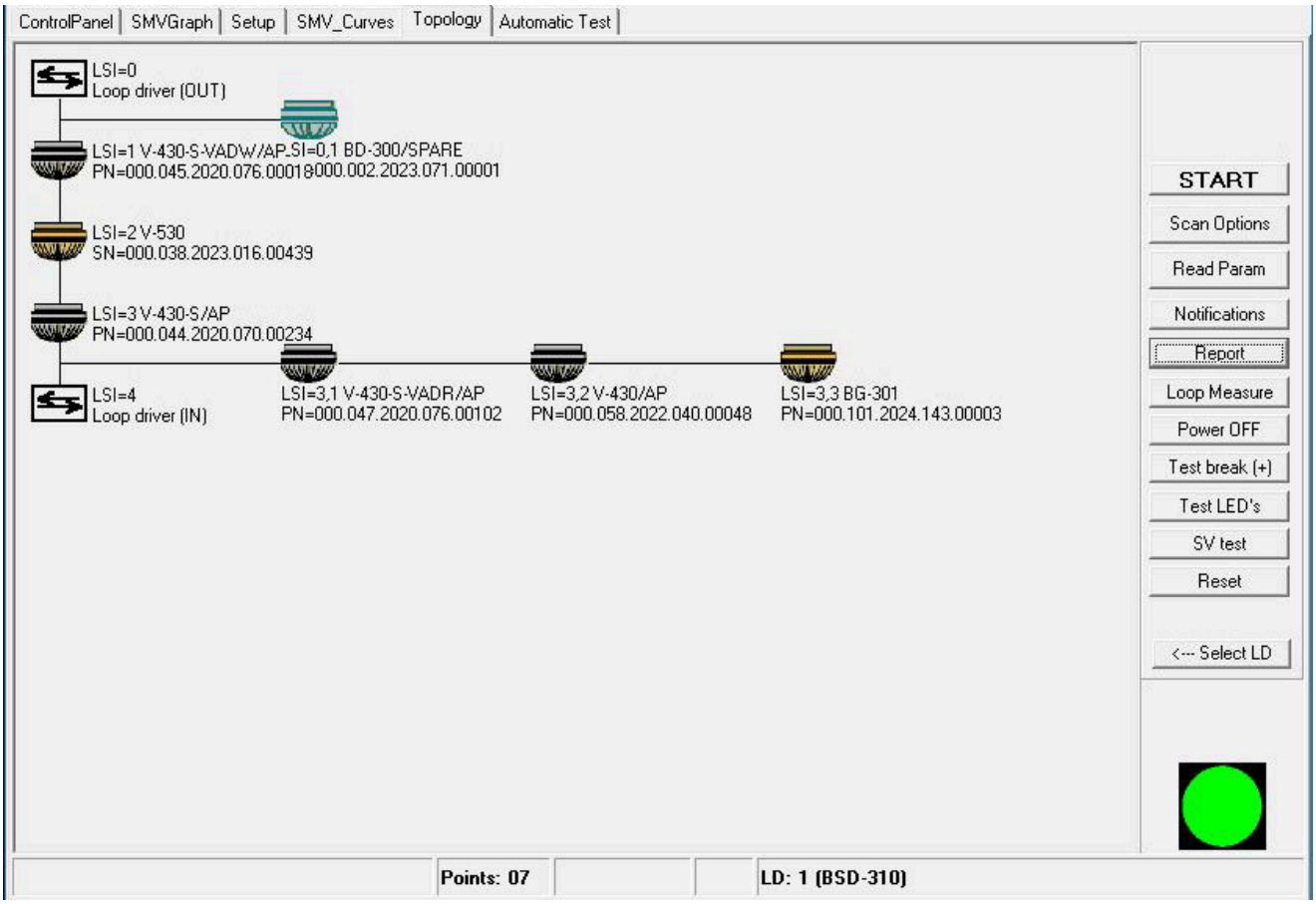


Figure 28. Check for green light

7.2.5. Confirm the new versions

After scanning the loop, click the **[Report]** button to *generate a report*. Check that all AutroGuard units have the correct firmware version (either 1.24.5 or 1.22.6).

If any of the units start in bootloader mode (blue icon), see *Section 7.3.2, "Some units start in bootloader mode"* for troubleshooting information.

7.3. Troubleshooting

After the loop has been scanned again, check that all units are found and that there are no new branches or breaks.

See the following sections for solutions to common problems.

7.3.1. Some units do not show up

Empty Autroprime sockets do not show up in the loop scan and can therefore not be updated.

All Autroprime sockets must have a protector to function correctly.

7.3.2. Some units start in bootloader mode

Sometimes, a unit gets stuck in bootloader mode after a firmware upgrade, which means it will not detect fire or activate any flash or sounder.

With Autroprime, this leads to the following prompt before you can see the loop topology (this prompt does not appear for AutroSafe):

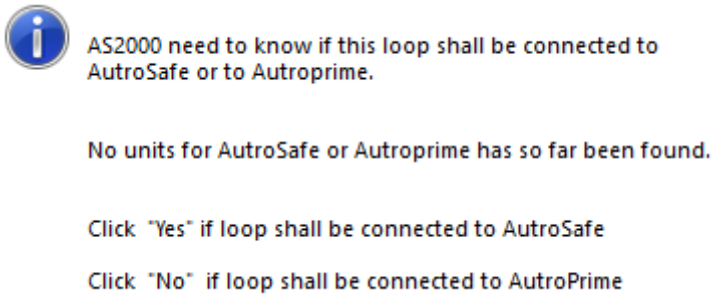


Figure 29. No units found

When the loop has been scanned, you will see blue symbols in the loop topology that indicate that the unit is in bootloader mode.

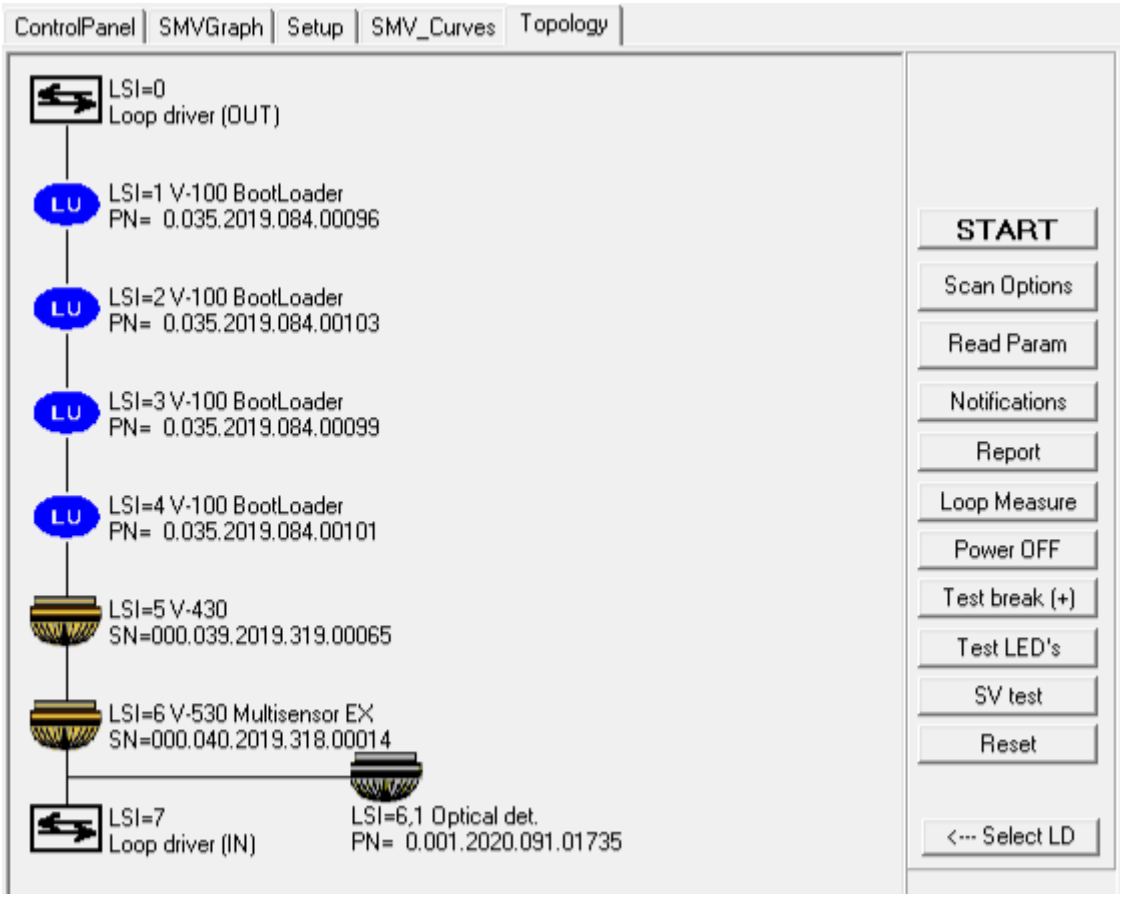


Figure 30. Blue symbols in the loop topology

Such units must be upgraded again before they work properly:

1. Open the firmware upgrade window (right-click on the unit icon and select **AutroGuard commands › Firmware upgrade**).
2. Confirm that you want to upgrade:

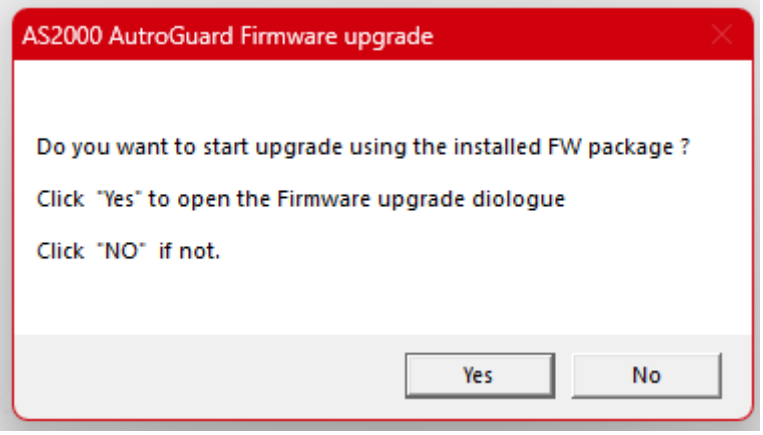


Figure 31. Confirm upgrade

3. Click **[Start Programming]** on the upgrade window to start the upgrade again.

In this case, AS2000 uses only the necessary firmware files for the upgrade, so the upgrade should take less time.

4. After the upgrade is done, power off the loop and rescan the loop.

7.3.3. Communication faults

AL_Com loops sometimes experience communication problems, CRC faults, missed packages and similar. AS2000 handles these faults during the firmware upgrade process, which might prolong the upgrade.

However, some loops that have a large number of communication faults, high resistance, EMC, poor wiring, and similar might be difficult to handle. If you see a lot of communication faults during the upgrade process, try the following methods to fix them:

- Add Ferrite cores to the serial cable.
- Close all other applications running on the PC.
- Try using another stack or loop driver.
- Check the loop wiring for cross connections.
- Make sure that nobody is removing protectors from sockets on the loop (this causes a reset and break).

7.3.3.1. EX units connected behind a BZ-500

Upgrading EX units connected behind an EX barrier unit BZ-500 might fail because the BZ-500 causes communication issues during an EX loop upgrade. If this happens, the protectors on the EX barrier will become non-functional and must be reprogrammed.

In this case, retry the upgrade.

If the upgrade keeps failing, it might be necessary to bypass the BZ-500 to achieve a successful upgrade.

Bypassing the BZ-500 will raise the voltage on the EX branch to 24 V. The branch can therefore no longer be classified as an EX branch. Always conduct a Safe Job Analysis (SJA) before performing the bypass! Ensure that the bypass is removed and normal EX conditions are restored before returning the system to operation.

Chapter 8. Monitor SMV information

Standard measure value (SMV) is a standardized measurement of the environment indicator monitored by a detector. For example, this could be the temperature or the smoke level detected in the environment, algorithmically calculated to a standard value that represents the risk level.

The standard measure value is used to determine the detector condition (Fault, Normal, Prealarm, or Alarm).

AS2000 can monitor SMV information for the detectors on the loop. Note, however, that this feature requires access level "Service".

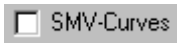
8.1. Watch SMV curves

On the **SMV_Curves** tab, you can watch up to four SMV curves at one time. The X-axis shows a period of time of 360 seconds (6 minutes), and the Y-axis shows the SMV. The limits for Prealarm and Alarm are drawn in yellow and are the same for all point types.

To watch a point's SMV curve, add the point in one of the following ways:

- On the **Topology** tab, right-click the point and select **Add to SMVCurves**. Choose a detector curve that is not in use.
- On the **SMV_Curves** tab, double-click one of the four detector symbols and enter the C-address of the point that you want to watch. You can see the C-address of a point in the static information of a loop unit (see *Section 6.2.1, "View information about a loop unit"*).

To select which point to watch at a time, select or deselect the checkbox for the corresponding detector curve.



Updating the SMV curves takes a lot of resources, so you might want to temporarily stop updating the enabled curves. To do so, deselect the "SMV-Curves" checkbox.

8.2. View SMV bar graphs

On the **SMVGraph** tab, you can watch instant SMV bar graphs for all points on the loop. The X-axis shows the loop sequence index (LSI) values of the loop presented on the **Topology** tab. If the LSI is unknown, the point is labeled as a question mark.

The individual bar graphs are updated every time AS2000 receives a new SMV from a point. Note that AS2000 never asks for a SMV, so if a point has disabled SMV transition or set the SMV transition window too high, the bar graph for this point might never be updated.

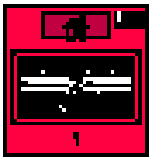
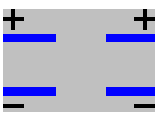
The screen shows only 20 points at the time, but you can scroll the displayed area by right-clicking in the graph area and dragging left or right.

You can choose whether to display actual (instant) values, minimum values, or maximum values. Minimum and maximum values are calculated from the moment AS2000 was started, or since the last reset.

Click the **[Update]** button to read fresh values from all points, and the **[Reset Min/Max]** or **[Reset all]** button to reset the corresponding values.

Chapter 9. List of symbols

List of all known symbols presented on the **Topology** tab:

	Loop driver (P0)
	Heat detector (BD-200/300/500)
	Optical smoke detector (BH-200/300/500)
	Multisensor (smoke&heat) detector (BH-220/320/520/V-430*/AP units)
	Manual callpoint (BF-200/300/500)
	Addressable sounder (BBR-200, BBR-110)
	Input / Output unit (BN-300, BN-310, BN-320, BN-201, BN-303, BN-304, BN-305, BN-307, BN-308)
	Topology ERROR *Probably caused by multiple branch-off, which is illegal. Double-clicking this symbol shows a list of the points causing the branch.*
	Unknown loop unit *Also used for AutroGuard units (boards) that are in bootloader mode.*
	Loop Break *Indicates a break in the loop wire at the indicated position.*

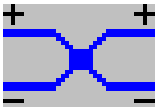
	Loop Short-circuit *Indicates a short-circuit on the loop wire.*
	Loop Communication Error *Indicates a communication error.*
	Point Flame Detector BG-201 AutroGuard units

Table 2. Symbols

Chapter 10. Examples of special topologies

10.1. Ex. 1: Break in loop wiring

In this example, AS2000 couldn't find the 'IN' side of the Loop driver when powering up from the 'OUT' side. Since AS2000 can't know which of points LSI-4 or LSI-3.1 is the main loop and which is the branch, AS2000 presents a break symbol after both. AS2000 will then power up the loop from the 'IN' side and find the points on the other side of the break. Note that if there is more than one break in the main loop, there may be several points missing in the loop topology presentation.

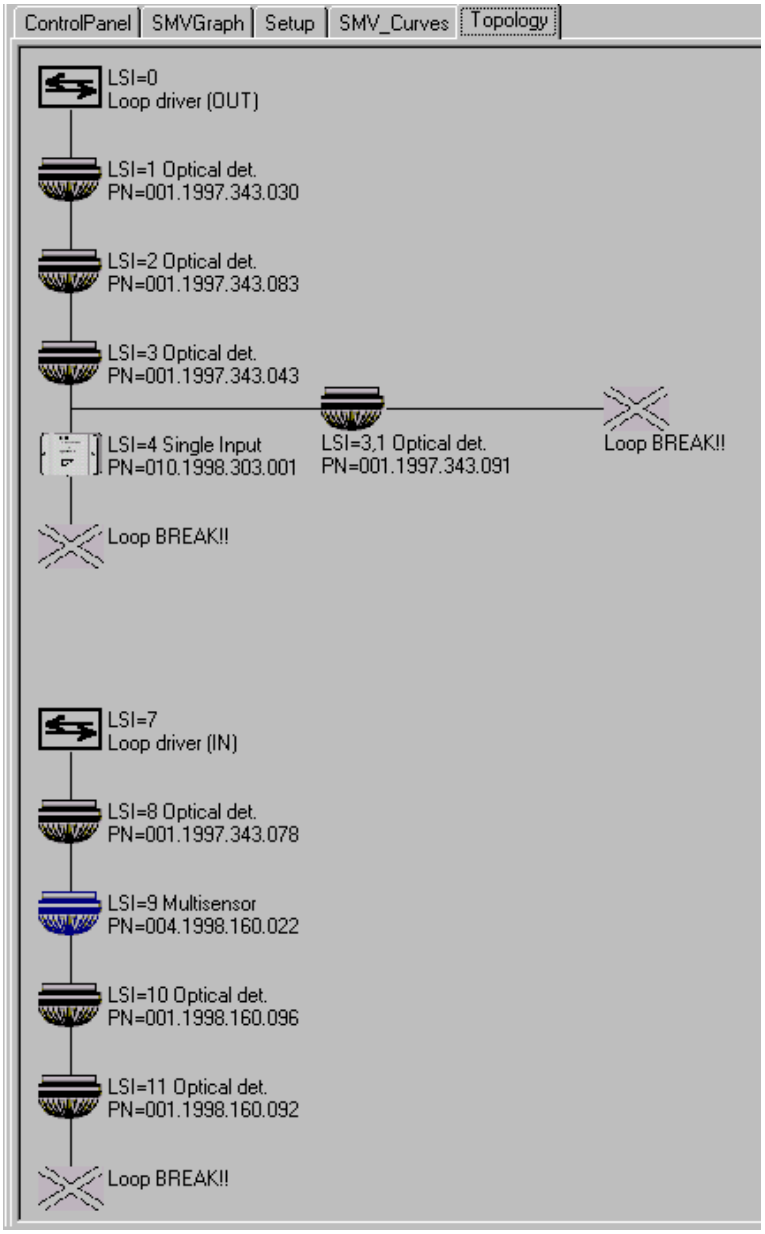


Figure 32. Break in loop wiring

10.2. Ex. 2: Multiple branch-off (star connection)

In this example, AS2000 has given a warning between LSI-19 and LSI-21. This is to indicate that when

closing LSI-19's switch, more than 2 new points were powered up. AS2000 cannot present more than 3 points in a star connection, and since more than 1 branch-off is an illegal topology , this warning is given.

So in this case, LSI-21, LSI-19.1, and LSI-20.1 are connected to the same point (LSI-19). A possible solution to this problem would be to connect branch 19.1 to 19.2 between the manual callpoint (LSI-18) and the Multisensor (LSI-19).

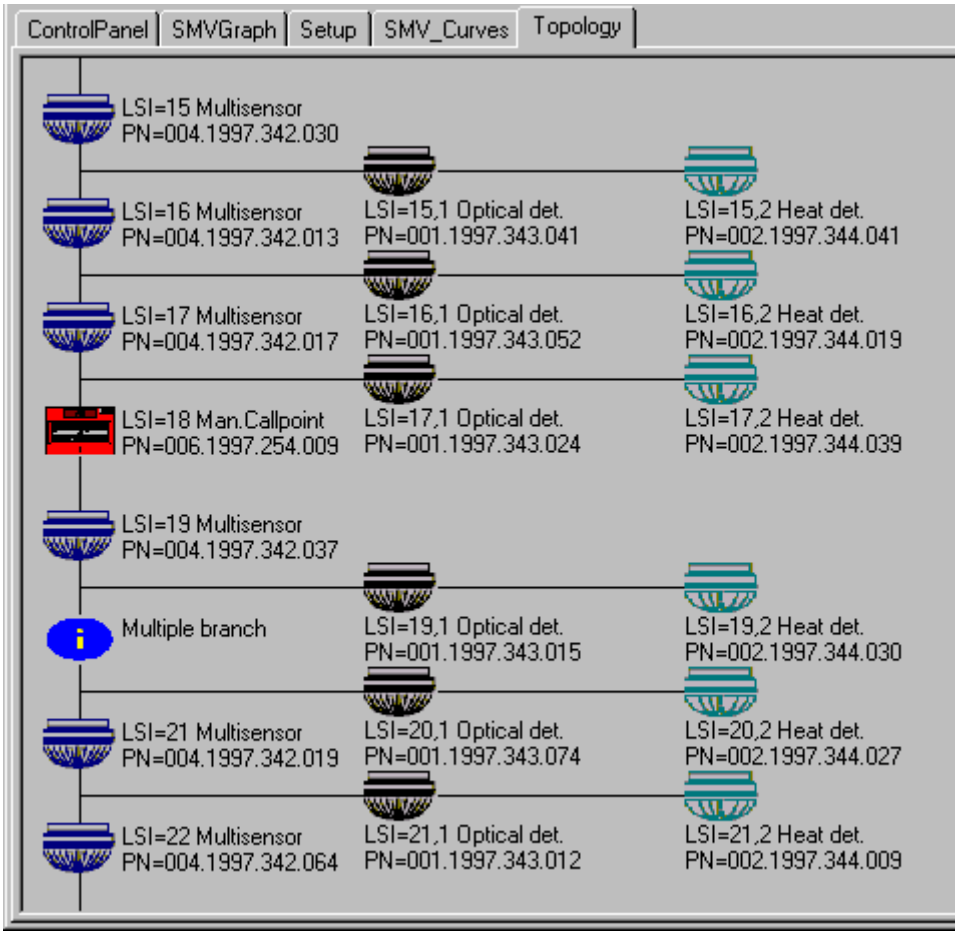


Figure 33. Multiple branch-off (star connection)

Note that AS2000 cannot present more than 3 points in a star connection. If there were more than LSI-21, LSI-19.1, and LSI-20 connected to LSI-19, these additional points would not be presented on the **Topology** tab.

10.3. Ex. 3: Inadequate interpretation of loop topology

In certain situations, AS2000 might not give a totally correct presentation of the loop topology. Several factors can affect the interpretation of the loop topology, for example, whether a point belongs to the main loop or a branch-off, which point is registered first during power up, if there is an illegal branch-off, etc.

In this example, AS2000 informs you that there is one multiple branch-off, and that there is a break in the loop wire. Note that this is actually not the fact, but a result of how the program interprets the loop in such a situation.

When more than one point powers up at the same time, AS2000 must guess which one belongs to the main

loop and which one is a branch-off.

If AS2000 comes to a break in the loop wire, it will swap the last assumption (main loop and branch-off) and continue. But if AS2000 makes a bad guess, and the branch chosen to be the main loop contains a new branch-off (illegal), AS2000 has problems.

Then the last assumption is verified to be true, and the topology presented will be difficult to understand. The presentation is not wrong, but it might be very inadequate.

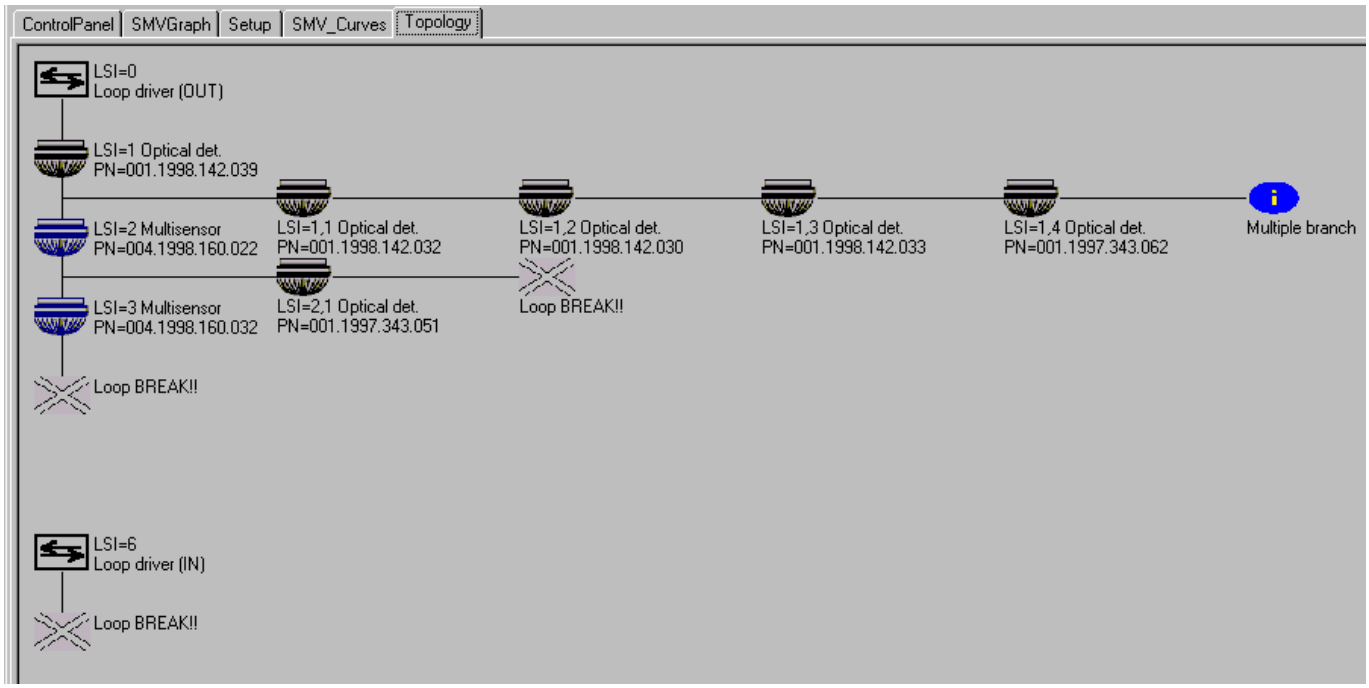


Figure 34. Inadequate interpretation of loop topology

In the example above, AS2000 guesses that LSI-2 is on the main loop and LSI-1.1 is the branch off. This is actually not true: LSI-1.1 is the main loop.

Normally, AS2000 will find out that it has made a mistake, and switch the last guess made. In this example, however, AS2000 meets a branch after LSI-2, and *since a branch in a branch-off is illegal*, it assumes that this is still on the main loop, and that the last guess (LSI-2) was correct. But as it can't find more points on what it thinks is the main loop, it assumes the loop has a break at this point.

So because of the illegal branch LSI-2.1, AS2000 is misled to believe it is still on the main loop.

As the assumed branch 1.1 is powered up, two points get powered up at the same time at the end of the branch. This is illegal (no branch-off in branch-offs), so AS2000 places a warning symbol there and stops presenting the rest of the branch.

The two points were actually the last point in what should have been the main loop, and the 'IN' side of the loop driver (closed loop).

Below, the correct topology is presented, as AS2000 would have presented it if it hadn't guessed wrong in the case of LSI-2, or if the illegal multiple branch-off didn't affect the presentation.

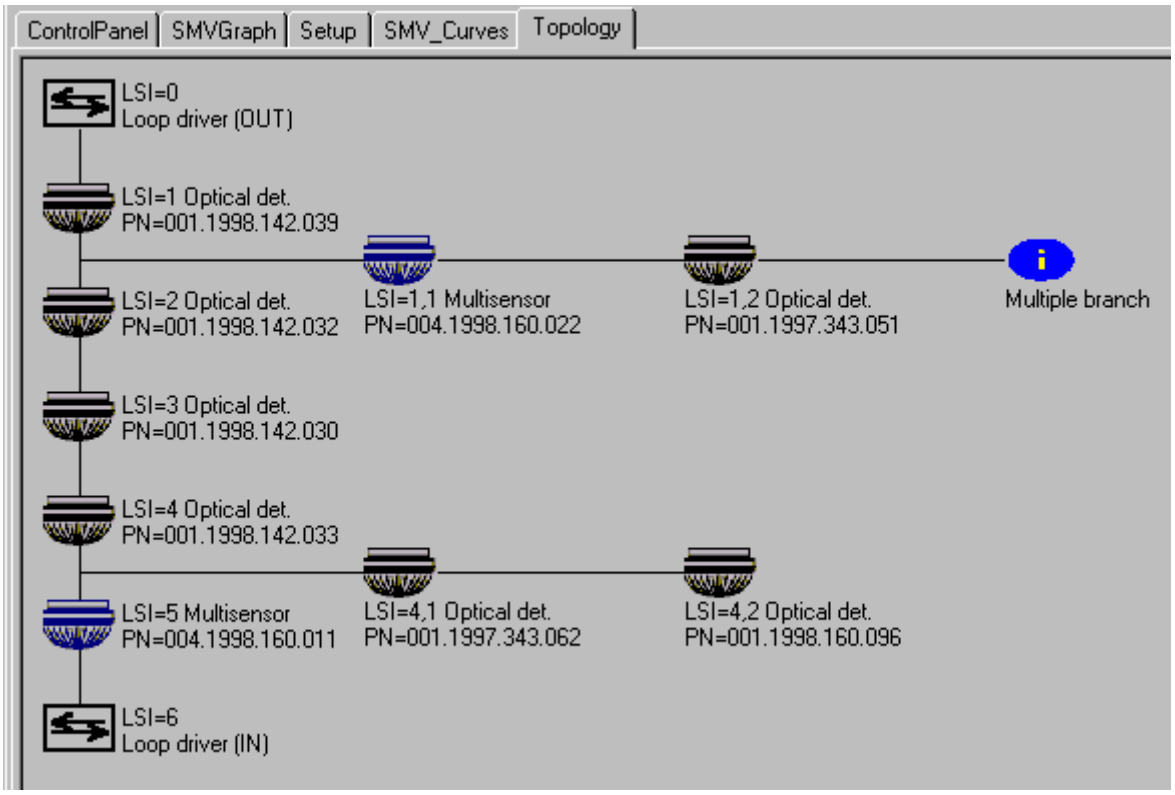


Figure 35. Correct topology

Chapter 11. Terms and abbreviations

Dual Safety system

A detection system that consists of a primary system and a secondary system, where the secondary system can take over the control of the detection loops if the primary system (or parts of it) is lost for any reason.

Fire alarm device (FAD)

A device that warns of fire, for example, through a sounder or visual indicator.

Loop sequence index (LSI)

A loop-specific index that specifies the exact order of units on the loop (sequentially numbered). The loop units are addressed according to their physical position on the loop.

Production number (PN)

A unique number that stays with a device for its entire lifetime. The production number includes the type of device, the manufacturer code, and the serial number.

SelfVerify (SV)

A self-test for a device that tests the signal path, the alarm devices, and the output units. This self-test ensures the highest grade of reliability and reduces the need for manual testing.

Standard measure value (SMV)

A standardized measurement of the environment indicator monitored by a detector. For example, this could be the temperature or the smoke level detected in the environment, algorithmically calculated to a standard value that represents the risk level.

Visual alarm device (VAD)

A unit that contains a visual alarm indicator (flash, beacon).

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