Agilent ICP-OES SVS 2 Productivity Package Installation and Upgrade Instructions

Introduction

The main component of the Agilent ICP-OES SVS 2 Productivity Package and the SVS 2 Productivity Package Upgrade is the Switching Valve System accessory. The switching valve supplied with the accessory or upgrade kit greatly reduces the time taken to introduce the next sample to the spraychamber (uptake delay) and also minimizes the stabilization and rinse delays. The result is a substantial reduction in the sample-to-sample cycle time.

These installation instructions outline how to:

- upgrade your SVS 1 to the SVS 2 switching valve (if required)

- set up the SVS 2 hardware

- install the software

- find additional instructions for completing the installation of the ICP-OES SVS 2 Productivity Package

This product is compatible with Microsoft® Windows® XP SP3 32-bit and Windows 7 SP1 64-bit operating systems.

Safety Information

Before using the accessory, you must read or be familiar with the Safety Practices and Hazards section in your spectrometer User's Guide and ICP Expert II Help.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

SVS 2 Accessory and Upgrade Setup

The initial setup and upgrade of the SVS 2 accessory involves:

- Unpacking the SVS 2 hardware

- Upgrading the SVS 1 to an SVS 2 switching valve (if required)

- Connecting the communication and power cables

- Installing the SVS 2 software and drivers

- Configuring the communications settings

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IMPORTANT   Before installing your SVS 2 accessory, you must ensure that your ICP-OES system is in good working order and passes your laboratory's performance tests.

NOTE   If the SVS 2 accessory was shipped with an Agilent 700 Series ICP-OES spectrometer, your ICP-OES system should be ready to operate after the Agilent representative has installed it. However, you may need to set up items such as the autosampler, peristaltic pump, nebulizer, torch, or spraychamber. For instructions on how to do this, please refer to the appropriate section of the ICP Expert II Help.

To access the Help:

1   Click the **Start** > **All Programs > ICP Expert II > ICP Expert II Help**.

2   When the ICP Expert II Help appears, click the **How to > Install instrument components** link to view step-by-step instructions on how to remove and install the various instrument components.

Unpacking the Hardware

The SVS 2 hardware components included in the ICP-OES SVS 2 Productivity Package and SVS 1 to SVS 2 Upgrade Kit are:

Item	SVS 2 Kit	Upgrade Kit
SVS 2 Unit including valve and actuator	✓	N/A
SVS 2 switching valve only	N/A	✓
Positive-displacement pump (the fast uptake pump)	✓	✓
4-port, USB-to-Serial converter	✓	✓
Communication cables	✓	✓
AC-DC adapters and appropriate power cables	✓ Quantity 2	✓ Quantity 1
Stand for the SVS 2	✓	N/A
Plumbing kits including color coded tubing and fittings	✓	✓

SVS 2 Unit

The main component of the accessory is the SVS 2 unit, which controls delivery of sample or rinse to the spraychamber via a switching valve. This two position, 11-port valve incorporates an internal tee and has a stacked arrangement of ports located around a central rotor.

Figure 1. SVS 2 unit

| TIP | The ports of the SVS 2 switching valve have been color-coded for easy setup. |

SVS 2 Switching Valve

Figure 2. SVS 2 switching valve used to replace the SVS 1 4-port switching valve

Fast Uptake Pump

A positive-displacement pump is used to rapidly draw liquid into a sample loop installed on the switching valve.

Figure 3. Fast uptake pump

USB-to-Serial Converter

Communication between the computer running ICP Expert II software and the autosampler, SVS 2 unit, and the fast uptake pump will be made through a four-port, USB-to-Serial converter.

Figure 4. Four-port, USB-to-Serial converter

| NOTE | Do not connect the USB-to-Serial converter to your computer with the supplied USB cable until prompted to do so in these instructions. |

| IMPORTANT | The USB-to-Serial converter is powered through the supplied USB cable connection to your computer. Do not connect an external power supply to the USB-to-Serial converter as this may result in damage to the unit. |

Communication Cables

One USB and three serial communication cables are included with the SVS 2 accessory.

| NOTE | The existing RS-232 (serial) communication cable between your autosampler and computer is also needed. |

AC-DC Adapters

The SVS 2 unit and the fast uptake pump are each supplied with an appropriate AC-DC adapter.

Stand

A stand must be used to ensure optimal performance of the SVS 2 accessory with an axial ICP-OES spectrometer.

Figure 5. Stand—used with axial models only

| TIP | When mounted on the stand within the sample compartment of an axial instrument, the ports along the left side of the switching valve should be aligned with the nebulizer. |

Plumbing Kits

Two plumbing kits are supplied with the SVS 2 accessory. One kit contains the tubing and fittings that connect to the switching valve and another kit includes the bubble injector and tubing associated with connections made to the fast uptake pump.

| TIP | For easy setup, the contents of the plumbing kits have been color-coded and/or labeled to correspond to the connections that are made to ports on the switching valve or to barbed fittings on the fast uptake pump. |

| IMPORTANT | Do not attempt to install the plumbing on the SVS 2 unit until you are instructed to. The SVS 2 Productivity Package Help contains all of the information necessary for selecting the most appropriate sample loop and plumbing the switching valve. |

| NOTE | The SVS 2 is supplied with a 1 mL sample loop kit. Alternate sample loops must be ordered separately. Refer to the Agilent website: www.agilent.com |

Upgrading your SVS 1 to the SVS 2 Switching Valve

If you are upgrading your SVS 1 to the SVS 2 Switching Valve, go to Page 10, follow the upgrade instructions and then return to the 'Connecting the Communication and Power Cables' section below to complete the installation.

Otherwise, go to the next section to start your installation.

Connecting the Communication and Power Cables

After unpacking the hardware components of the SVS 2 accessory, carefully follow the instructions provided below to connect the communication and power cables to your hardware.

| NOTE | Before continuing, ensure that your ICP-OES system is not in use and that your autosampler has been switched off and the ICP Expert II software is closed. |

To connect communication cables to your SVS 2 accessory:

1   Disconnect the autosampler communication cable from the communication port (COM1) on your computer.

2   Reconnect the autosampler communication cable to the port labeled 'PORT 1' on the USB-to-Serial converter.

3   Connect the end of the serial cable, labeled 'USB TO SERIAL CONVERTER PORT 4', to the port labeled 'PORT 4' on the USB-to-Serial converter.

4   Connect the end of the serial cable labeled 'AUTOSAMPLER PC SERIAL PORT' to the communication port (COM1) on your computer.

5   Place the USB-to-Serial converter on a flat surface near to your spectrometer, for example, on top of the computer.

| NOTE | The autosampler and the computer are now connected to the USB-to-Serial converter. |

6   Connect the end of the serial cable, labeled 'USB TO SERIAL CONVERTER PORT 2', to the port labeled 'PORT 2' on the USB-to-Serial converter.

7   Connect the end of this serial cable, labeled 'SVS1/SVS2', to the communication port (COM) on the back of the SVS 2 unit.

8 Place the SVS 2 unit within the sample compartment of your ICP-OES spectrometer.

NOTE You have now connected the SVS 2 to the USB-to-Serial converter.

9 Connect the end of the serial cable, labeled 'USB TO SERIAL CONVERTER PORT 3', to the port labeled 'PORT 3' on the USB-to-Serial converter.

10 Connect the end of this serial cable, labeled 'UPTAKE PUMP', to the communication port (COM) on the back of the fast uptake pump.

11 Place the fast uptake pump within the sample compartment of your ICP-OES spectrometer, as far to the left as possible.

NOTE You have now connected the fast uptake pump to the USB-to-Serial converter.

12 Connect the square end of the USB cable to the appropriate port ( ) on the USB-to-Serial converter.

CAUTION Do not connect the other end of the supplied USB cable until prompted to within these instructions.

To connect power cables to your SVS 2 accessory:

1 Connect a power cable to each of the supplied AC-DC adapters.

2 Connect the appropriate end of the pump's AC-DC adapter to the power connection on the rear of the fast uptake pump.

3 Connect the appropriate end of the pump's AC-DC adapter to the power connection on the rear of the SVS 2.

4 Route the cable outside of the sample compartment and place both of the AC-DC adapters underneath the front edge of the spectrometer.

5 Plug each of the power cables into an available mains power socket.

6 Switch on the power to the SVS 2 hardware.

NOTE When power is connected to the SVS 2 unit, an automatic alignment of the switching valve is performed. A blue LED on the front of the unit will indicate that the switching valve is on and in its Home position.

Software Installation

The ICP-OES SVS 2 Productivity Package Software CD-ROM will install the files required to run the SVS 2 software, which may include upgrading your computer's version of Microsoft® .NET Framework. Carefully follow the instructions provided below to install your software.

NOTE The USB-to-Serial converter should only be connected to the computer after installing the software. If you have not already done so, unplug the USB cable before proceeding with the installation. Depending on your operating system setup, you may also need to restart the computer.

To install the ICP-OES SVS 2 Productivity Package software:

1 Log on to the instrument computer with Administrative rights.

2 Close all running programs.

3   Insert the ICP-OES SVS 2 Productivity Package Software CD-ROM in your
computer's CD drive.

- Windows XP: The installation setup program should automatically run.
- Windows 7: At the AutoPlay prompt select **Run Setup.exe** and then click
  Yes at the following prompt.

NOTE	If no installation screen or AutoPlay prompt appears, browse to the 'SVS2_Software' directory on the installation CD and run the 'Setup' application.

Before the software installation starts, you may be prompted to install Microsoft .NET Framework 2.0. If prompted, navigate to the DOTNET directory on the installation CD and run the dotnetfx application to install the .NET Framework 2.0.

4   Follow the instructions on the screen to install the SVS2 software.

CAUTION	Agilent strongly recommends that the SVS 2 software be installed in the default/recommended C:\SVS2 directory. Agilent does not guarantee the behavior of the software if it is installed to another location.

5   Click **Finish** to exit the SVS2 software installation.

6   Click **Install** on the ATEN USB-to-Serial Hub Drivers Setup window when
displayed.

7   When the installation is complete click **Exit**.

8   Connect the USB cable from the USB-to-Serial converter to an available USB
port on your computer.

9   The 'Found New Hardware' status message will appear in the notification area
of the Windows Taskbar.

NOTE	It can take several minutes after connecting the USB-to-Serial converter for all of the drivers to be installed and configured. Ensure the driver installation is complete (5 devices in total) before continuing. Depending upon the version of Microsoft Windows operating system, your computer may need to be restarted for all four of the COM ports to be recognized.

Communication Settings

After installing the SVS 2 software it is necessary to configure the communication settings for the communication ports on the USB-to-Serial converter to be assigned to control the SVS 2 unit, the fast uptake pump, and your autosampler.

The application will only determine the COM port assignments for the supplied ATEN USB-to-Serial converter. The COM port assignments displayed in this file assume the serial port connections between the USB-to-Serial converter and the hardware have been made as per the installation instructions. Ensure that the connections have been made as per these instructions prior to configuring the communication settings for the SVS 2 software.

IMPORTANT	If the SVS 2 software is to be used by different individuals logging on to this computer, the following procedure must be performed separately for each user account.

To configure the communication settings:

1 Start the SVS 2 software either by clicking the SVS 2 icon in the Quick Launch bar or double clicking the desktop icon.

> **NOTE** The first time that the software has been started, a pop-up window should appear to indicate that you need to configure the serial ports before continuing.

2 Click **OK**. The 'Setup' window will appear and the 'Communications' tab is displayed.

3 Select the model that you are using from the **Autosampler** list (refer to Table 1).

Table 1. Selecting an autosampler model

Autosampler	Select
AIM 3600	AIMLAB AIM3600
AIM 1250	AIMLAB AIM1250
AIM 1250 (No Rinse Pump)	AIMLAB AIM1250 NoRinse
Cetac ASX-500 series	Cetac 500 Series
Cetac ASX-500 series (No Rinse Pump)	Cetac 500 Series NoRinse
Varian/Agilent SPS3 (ICP Expert instrument software)	Varian SPS3 Expert
Varian/Agilent SPS 3 (ICP Expert II instrument software)	Agilent SPS 3 Expert II

4 Navigate to the SVS 2 Help directory (default: C:\SVS2\Help) and run the 'SVS2_COM_Config' application.

5 A text file will open in 'Notepad', displaying the determined USB-to-Serial converter COM port assignments (see below).
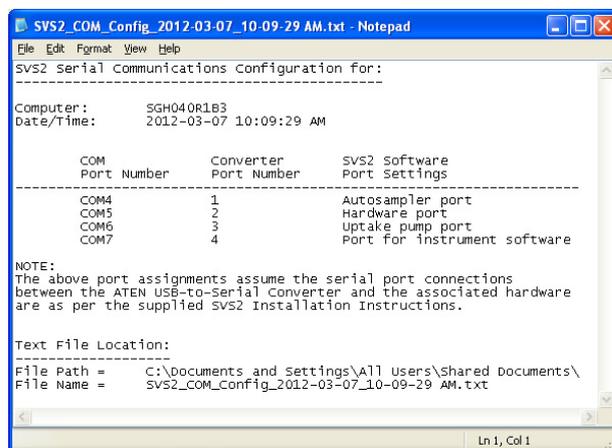

Figure 6. Text file example

> **NOTE** A copy of this text file will be saved to the default Public Documents or Shared Documents directory on the PC:
> Windows 7: C:\Users\Public\Public Documents\. Files in this location are also visible in the 'Documents Library'.
> Windows XP: C:\Documents and Settings\All Users\Shared Documents\.
> If any problems are encountered an error message will be displayed with a probable cause, take steps to remedy the problem and re-run the application.

INFORMATION Depending on your Anti-Virus/Malware software the 'SVS2 COM Config' application may be falsely identified as malware.

IMPORTANT The COM port assignments for the USB-to-Serial converter ports must not exceed COM32. Refer to the Troubleshooting section of the ICP-OES SVS 2 Productivity Package Help for instructions on how to renumber the COM ports.

6   From the **Port for instrument software** list in the SVS 2 software, select the COM port listed in the SVS2 COM Config text file as 'Port for instrument software' (Converter port number 4).

7   From the **Autosampler port** list, select the COM port listed in the SVS2 COM Config text file as 'Autosampler port' (Converter port number 1).

8   From the **Hardware port** list, select the COM port listed in the SVS2 COM Config text file as 'Hardware Port' (Converter port number 2).

9   From the Uptake pump port list, select the remaining COM port listed in the SVS2 COM Config text file as 'Uptake pump port' (Converter port number 3).
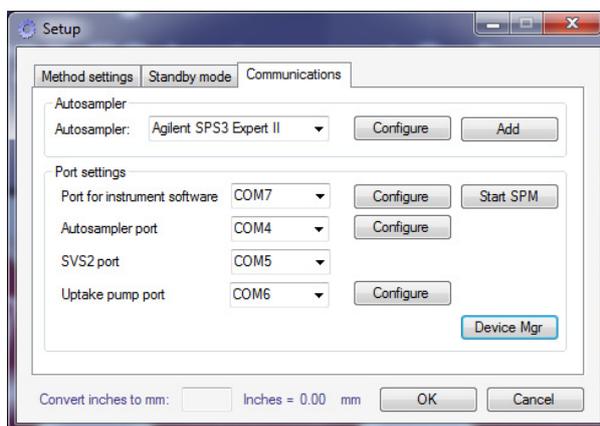

Figure 7. Port settings—all COM ports assigned

10   Click **OK**. A message will appear that indicates the communication settings have changed.

11   Click **OK**. A message will appear indicating that no method has been selected and that you need to configure the 'Method Settings' before continuing.

12   Click **OK**. The 'Setup' window will appear and the 'Method settings' tab is displayed.

13   Click **Cancel**. The functions of the 'SVS 2' window are now accessible.

14   Click **Help**. The ICP-OES SVS 2 Productivity Package Help will appear in a new window.

15   On the Help home page, click **How To > Installation Instructions (cont.)**. Read the step-by-step instructions provided to complete the installation of your SVS 2 accessory.

Additional Information

Refer to the Agilent ICP-OES SVS 2 Productivity Package Help for additional information on how to complete the installation of the SVS 2 accessory and optimize its performance, as well as how to maintain the hardware and basic troubleshooting tips.

To view the ICP-OES SVS 2 Productivity Package Help:

1   Double-click the **SVS 2** icon on your desktop.

2   When the 'SVS 2' window appears, click the **Help** button.

For further information about Agilent and our products please contact your local Agilent representative or visit our website: www.agilent.com

SVS 1 Accessory Upgrade

The following instructions describe how to upgrade your Agilent SVS 1 or Varian SVS1 accessory with an Agilent SVS 2 switching valve.

NOTE	You must follow these upgrade instructions before you can refer to the installation instructions that have been supplied with this upgrade.

The upgrade of the SVS 1 accessory involves:

1   Disconnecting the SVS 1 hardware

2   Removing the SVS 1 switching valve

3   Installing the SVS 2 switching valve

IMPORTANT	Before upgrading your SVS 1 accessory, you must ensure that your ICP-OES system is in good working order and passes your laboratory's performance tests.

Disconnecting the SVS 1 hardware

Before upgrading your SVS 1 accessory, you must first disconnect the Switching Valve System from your ICP-OES system.

WARNING	**Chemical Hazard**
	Liquids drawn through the switching valve and tubing connected to the ports on the valve may be corrosive or otherwise hazardous to health. Before disconnecting your SVS 1 accessory, flush through the tubing and switching valve thoroughly with an appropriate solvent (usually deionized water) to remove any contamination.

NOTE	Before continuing, ensure that your ICP-OES system is not in use and close the ICP Expert II software and then switch off your autosampler.

To disconnect your SVS 1 accessory from your ICP OES system:

1   Switch off the power to the SVS 1 accessory.

2   Disconnect the tubing connecting the SVS 1 switching valve to the nebulizer.

3   Carefully remove the nebulizer from the spray chamber.

4 Disconnect the power cable from the rear panel of the accessory.

5 Unplug the communication cable from the accessory and the autosampler.

6 Disconnect the tubing between your autosampler and the accessory.

7 Disconnect the tubing connecting the SVS 1's switching valve to the rinse and waste lines on the peristaltic pump of the spectrometer.

8 Lift the SVS 1 accessory out from the sample compartment of the spectrometer.

9 Disconnect all of the fittings from the SVS 1 switching valve.

| NOTE | Keep the nebulizer, SVS1 switching valve, and all of the cables, tubing and fittings, as you may need to use these again in the future. |

Removing the SVS 1 Switching Valve

To remove the switching valve from your SVS 1 accessory:

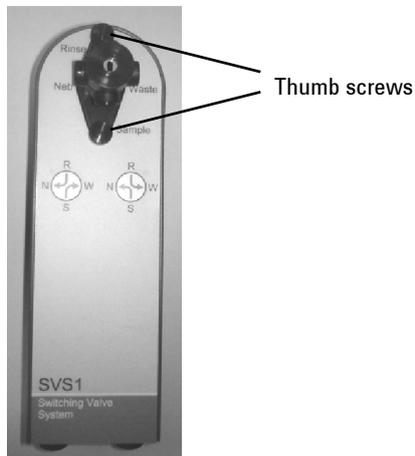**1** Place the SVS 1 accessory on a flat surface with its front panel facing up.

Figure 8. SVS 1 accessory

2 Unscrew the two black thumb screws that attach the valve to the body of the actuator.

3 Lift the switching valve out from the actuator mechanism.
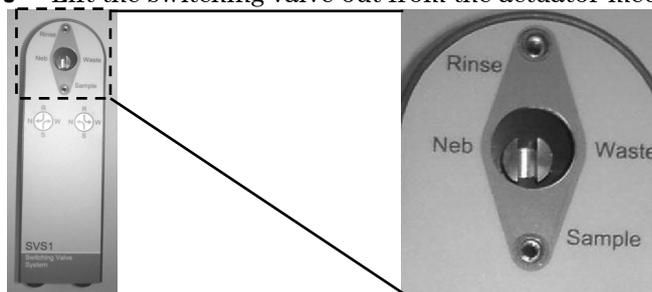

Figure 9. SVS 1 accessory: left—with switching valve removed; right—close-up of the actuator mechanism

4 Remove the thumb screws from the holes in the mounting plate of the SVS 1 switching valve. These will be used to attach the SVS 2 switching valve.

Installing the SVS2 Switching Valve

After unpacking the components of the upgrade kit, find the SVS 2 switching valve.

Figure 10. SVS 2 switching valve

Carefully follow the instructions provided below to install the SVS 2 switching valve.

To install the SVS 2 switching valve on your SVS 1 accessory:

1 Insert the SVS 2 switching valve into the hole in the SVS 1 accessory. The tab on the end of the rotor's drive shaft should slot into the groove in the actuator mechanism.

NOTE	When the switching valve is located properly, the mounting plate sits against the front of the SVS 1 unit, so that there is no gap between the two surfaces.

2 If necessary, rotate the switching valve about the rotor until the holes on the mounting plate align with those on the accessory and the blank fitting on the valve is positioned as shown in Figure 1.

3 Insert the thumb screws through the holes in the mounting plate and screw them in. This secures the switching valve to the accessory.

This completes the upgrade of your SVS 1 to an SVS 2 accessory.

IMPORTANT	Do not attempt to install the plumbing on the SVS 2 switching valve until you are instructed to. The ICP-OES SVS 2 Productivity Package Help contains all of the information necessary for selecting the most appropriate sample loop and plumbing the switching valve.

Completing the Accessory Installation

Go to the section 'Connecting the Communication and Power Cables' on Page 5 to complete the installation of the accessory.

This information is subject to change without notice.