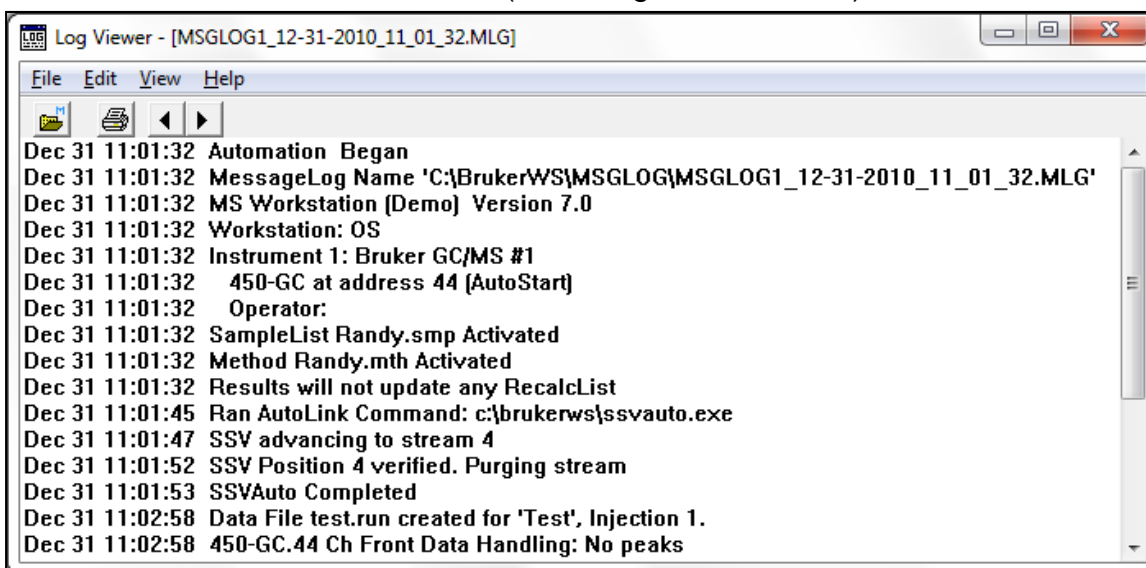# Helpful Hints with Bruker Stream Selector Valve (SSV) Software with Bruker MS Workstation Station

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Specific details for complete operation of the Stream Selector Valve (SSV) software are provided in the SSV Operator's Manual, available from Lotus Consulting. The following discussion provides some useful hints not included in this manual.

1. **Message Log Documentation** – Operations involving positioning the Stream Selector Valve for each sample line in the SampleList is fully documented in the MessageLog that is generated for every process performed in System Control. This log is located in the MSWS folder [c:\BrukerMS, c:\VarianMS, or c:\Star], subfolder MSGLOG, with a representative file label MSGLOG1_2011-10-03_11:17:27.MLG (indicating date and time).

```
Log Viewer - [MSGLOG1_12-31-2010_11_01_32.MLG]
File  Edit  View  Help

Dec 31 11:01:32 Automation Began
Dec 31 11:01:32 MessageLog Name 'C:\BrukerWS\MSGLOG\MSGLOG1_12-31-2010_11_01_32.MLG'
Dec 31 11:01:32 MS Workstation (Demo) Version 7.0
Dec 31 11:01:32 Workstation: OS
Dec 31 11:01:32 Instrument 1: Bruker GC/MS #1
Dec 31 11:01:32    450-GC at address 44 (AutoStart)
Dec 31 11:01:32    Operator:
Dec 31 11:01:32 SampleList Randy.smp Activated
Dec 31 11:01:32 Method Randy.mth Activated
Dec 31 11:01:32 Results will not update any RecalcList
Dec 31 11:01:45 Ran AutoLink Command: c:\brukerws\ssvauto.exe
Dec 31 11:01:47 SSV advancing to stream 4
Dec 31 11:01:52 SSV Position 4 verified. Purging stream
Dec 31 11:01:53 SSVAuto Completed
Dec 31 11:02:58 Data File test.run created for 'Test', Injection 1.
Dec 31 11:02:58 450-GC.44 Ch Front Data Handling: No peaks
```

2. **"Error Opening Comm Port" error in MessageLog** – If the requested SSV Position is not confirmed, an error is indicated and automation is terminated for that sample. The most likely causes of the problem are a disconnection between the Control Module and the COMM port, or open windows shown in the Task bar at the bottom of the screen (see Hint 4). Operations can be checked by following the listing in Hint #3

```
Jun 18 17:50:26 Ran AutoLink Command: C:\star\Ssvauto.exe
Jun 18 17:50:28 SSV: Error opening Comm Port 4-Automation Halted!
```

3. **Verification of SSV Operations –** If the SSV is not working properly, the following steps can help in diagnosing the problem.
   a. Using the Manual Controller mounted on the instrument and connected to the Control Module with a multi-colored ribbon cable, increase and decrease the current position with the step button. If the position changes as expected, proceed to step b. If the change does not take place, verify that the Control Module is powered and has all of its cables fully engaged.

b. Open up the SSV Manual icon on the computer desktop[1] and manually advance the position with the up and down arrows on the cloned Manual Controller. If operations occur as anticipated, then communications between computer and Control Module are active and all operations should proceed without errors. If a problem continues, then Hints 4 and 5 should be performed. An improper COMM port assignment is often indicated by red dashes [- -] in the SSV Manual window.
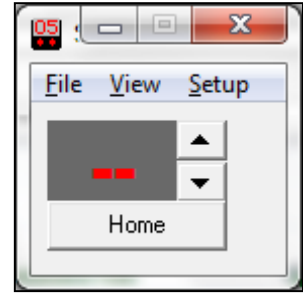
c. Operations can also be checked through HyperTerminal.[2,3] The process steps are:
   i. Open hypertrm.exe.
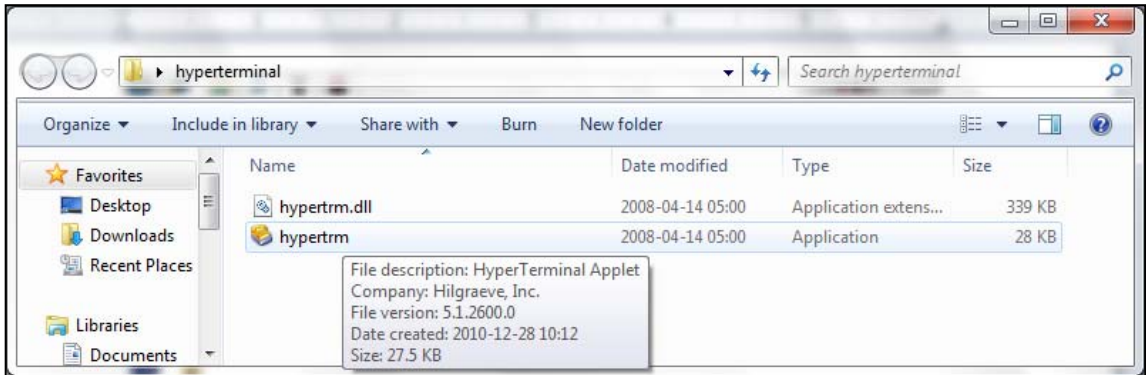
   ii. Enter any name for the prompt. "Blank" is not a legal entry; any name will do.
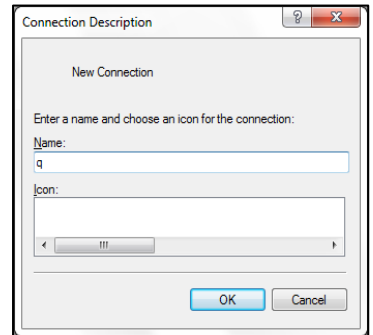
   iii. Chose the appropriate COMM port determined in Hint 5 and click OK.

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[1] If the SSV manual icon does not appear on the Desktop, then file "SSVMan.exe" can be located in the Workstation master folder (either c:\VarianWS, c:\Bruker WS or c:\Star) and right-clicked to send to Desktop.

[2] Windows 7 does not have HyperTerminal installed. This utility - hypertrm.exe - can be copied from any Windows XP and is usually located in folder C:\Program Files\Windows NT; a copy is attached to this email. Then this program shortcut can be sent to Desktop for easy activation.

[3] With Windows XP, HyperTerminal is activated through All Programs > Accessories > Communications > HyperTerminal.

iv.   Set all parameters as indicated to the right and click OK.
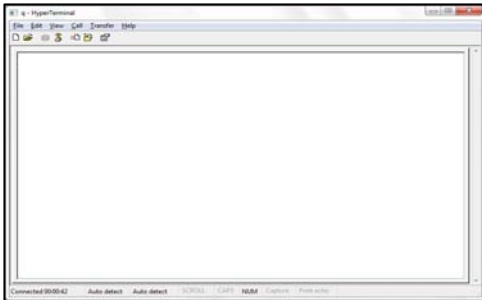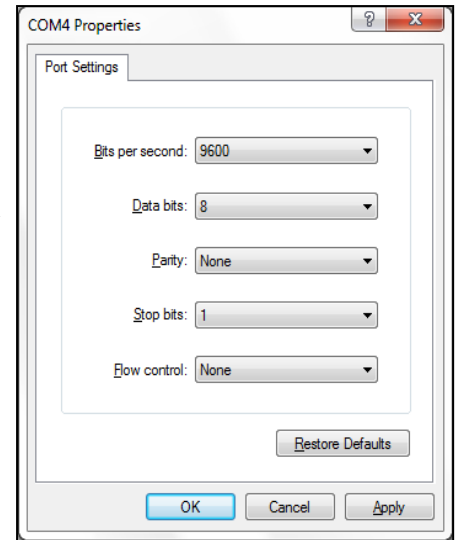
v.   A clean screen is presented for user entries.

vi.   An entry of CP will then indicate the current position.[4] The same listed number as on the Manual Controller is positive indication that the computer and Control Module are communicating. If no response is indicated or an error message is shown, communication has not been established; cabling and connections should be checked.
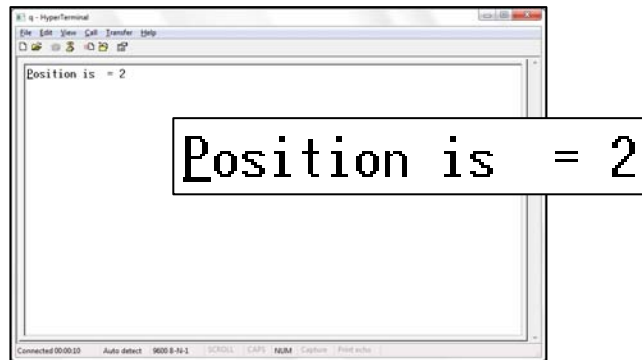

4.   **Close all SSV tasks on Taskbar prior to starting automated operations -** For SSV software to execute properly, communications must remain open during operations through the specified COMM port. Before a Workstation SampleList is started, all tasks related to "SSV" open to the right of the Start button at the bottom of the screen must be closed, or correct actions will not be processed, and "Error Opening Comm Port" will be indicated. Simply "right-click" on the open SSV buttons and close the task, and then restart Workstation automations. This episode often occurs if Automations are halted in the middle of an execution of the SSVAuto.exe program.


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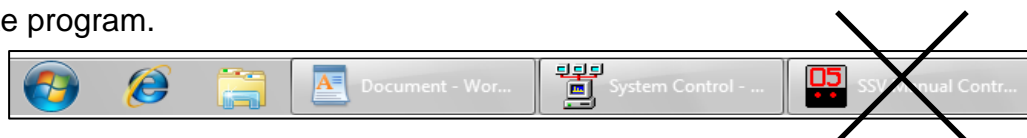
[4]   User-typed entries are not displayed, only returned values.

5. **Identifying COMM port connection and defining Port # in SSV software -** Control of the Stream Selector Valve is performed through serial communication protocols provided with the SSV Software. The port used must be set in the SSV Setup parameters for proper operations. Most computers have several available COMM ports, and additional ones accessed when a Serial-to-USB connector is used. To determine which port is employed, Control Panel is opened and Device Manager selected:[5]
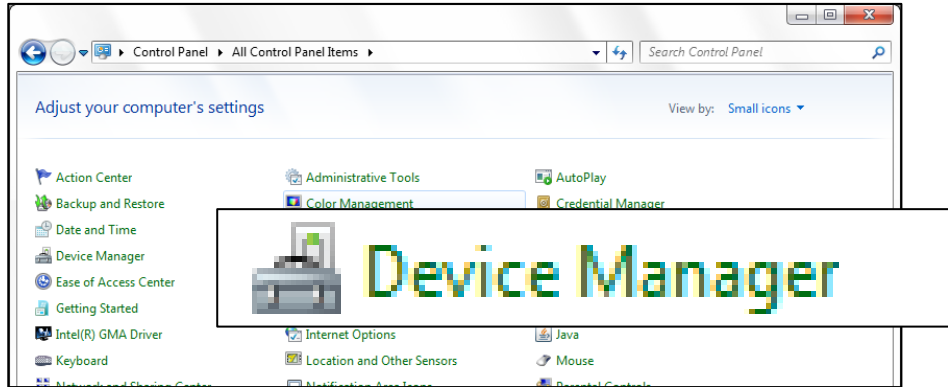

From Device Manager, observe available Ports - expand out if needed by clicking on "Ports". Then plug in the cable from the SSV Control Module and see if a new COMM is added to the list; that is now the COMM port to be set.
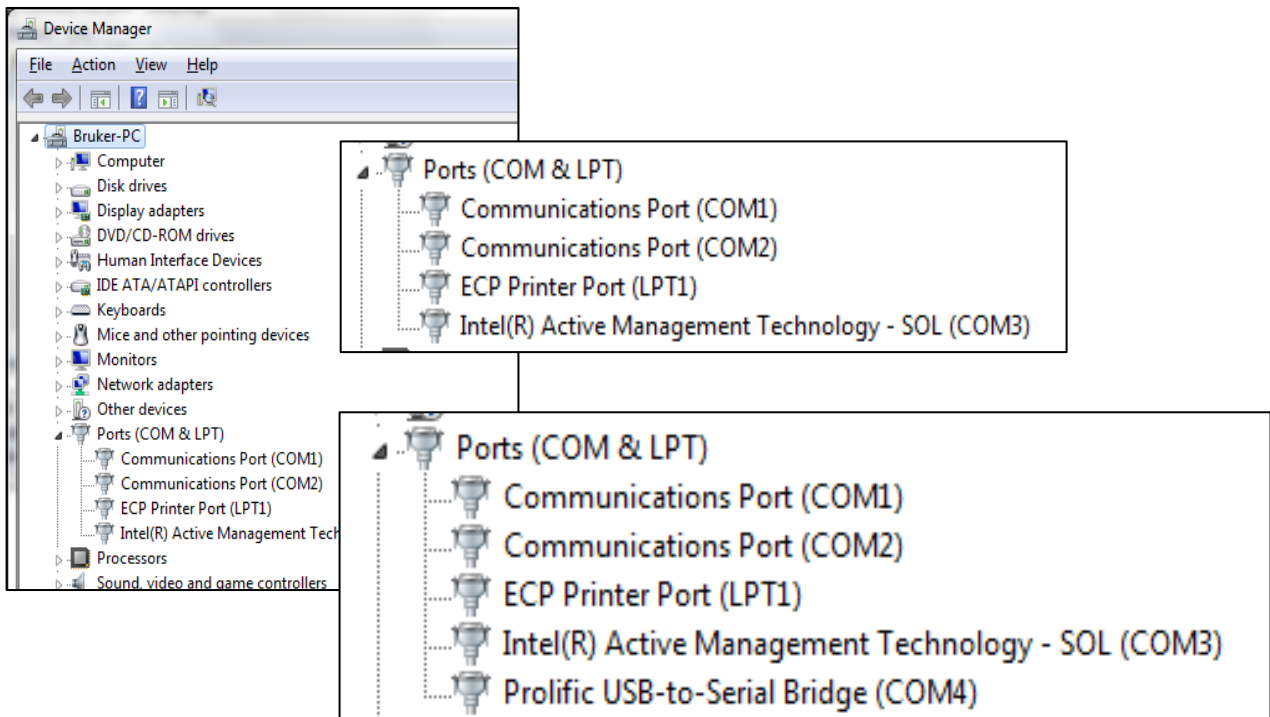
If a new one does not appear, then the COMM port is likely to be COMM 1, or COMM 2 (if available). The active COMM port can be determined by using steps outlined in Hint 3.c. above and choosing COMM 1 or COMM 2 to see which one works.

---

[5]   With Windows XP, Device Manager is accessed by Start > Control Panel > System > Hardware tab > Device Manager.

After the COMM port # is ascertained, it is entered into the program through the SSV Manual window, accessed from the Desktop, from the pulldown menu labeled Setup. By picking "Port", a prompt opens to enter in the Port #. Since the "OK" button is below the open window, click-drag the lower right corner will open it up to access it.
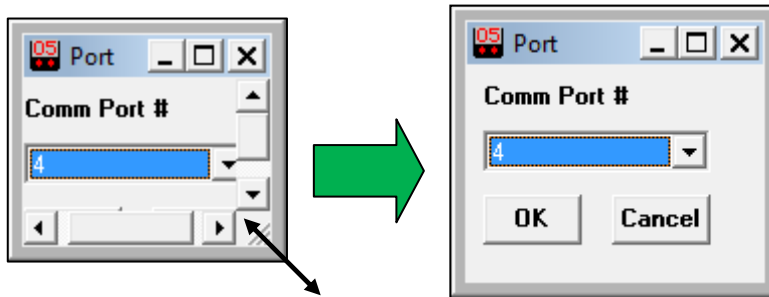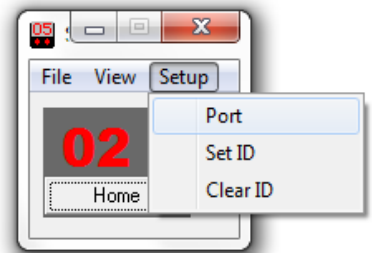
6. **Serial to USB connector -** New computers now come *without* a 9-pin COMM port, common with older computers. An available converter cable (Fry's Electronics P/N 4322725, $17.99) can be readily installed to allow direct connection to any USB port. A CD with the required driver normally is provided with the cable kit and must be loaded. If a USB port connection is physically moved to a new USB port, Windows automatically switches the COMM Port #, but does not update the port assignment in the SSV setup. Hint 5 must be followed to relocate the new port assignment and the new number must be entered.

7. **Two SampleList operating modes** - To provide some flexibility in setting up operations with the SSV program, two choices are available to set the position of the SSV:

    a. With one mode, the sample position is entered into the "Amount Std" column for each sample.[6]

    i. The first line has its Sample Type as "Autolink" with AutoLink Parameters as indicated to the right, with Other parameters of "-i".

---
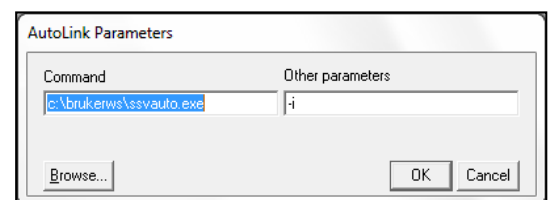
[6] This mode looks ahead two sample lines by design. As a result, two lines below the active sample number cannot be altered, amended or deleted, or automation will be halted.

ii. Then each subsequent line has a single entry in the Command line, but no entry for Other Parameters.

AutoLink Parameters

Command	Other parameters
c:\brukerws\ssvauto.exe	

Browse...   OK   Cancel
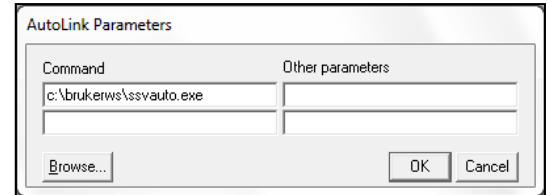
b. This second mode frees up the Amount Std column in the event that Internal Standards are employed and must have an entry in this field. Here the sample position is specified before each sample.

Automation File Editor - [Randy.smp]

File   Edit   Help

Randy.smp - Generic SampleList

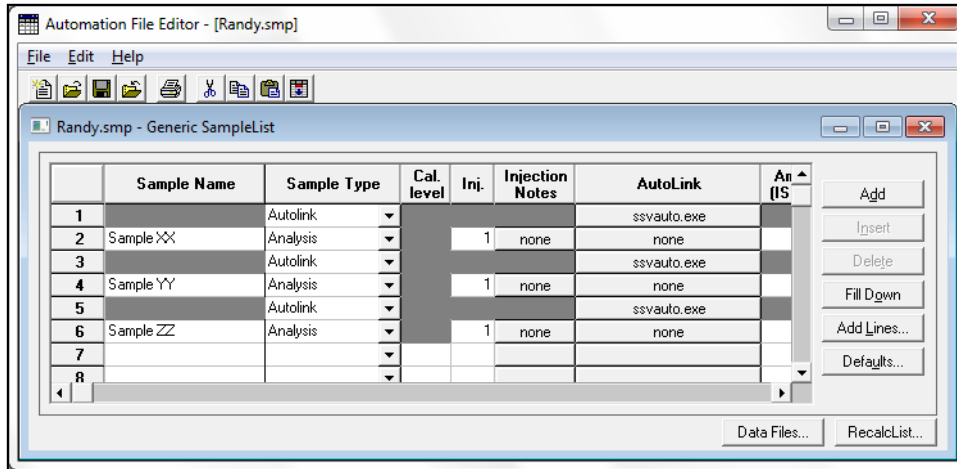|	Sample Name	Sample Type	Cal. level	Inj.	Injection Notes	AutoLink	An (IS	
1		Autolink				ssvauto.exe		Add
2	Sample XX	Analysis		1	none	none		Insert
3		Autolink				ssvauto.exe		Delete
4	Sample YY	Analysis		1	none	none		Fill Down
5		Autolink				ssvauto.exe		Add Lines...
6	Sample ZZ	Analysis		1	none	none		Defaults...
7								
8								

Data Files...   RecalcList...

The line preceding each sample entry must have a Sample Type of "Autolink" with AutoLink Parameters as shown to the right. Other parameters entry becomes "-s 5", where 5 is the sample stream to be run with the next sample line.

AutoLink Parameters

| Command	Other parameters
c:\brukerws\ssvauto.exe	-s 5

Browse...   OK   Cancel
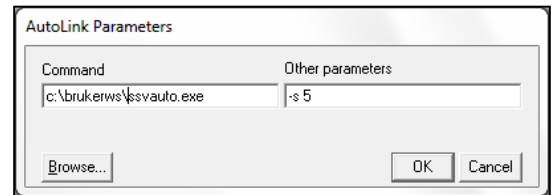
8. **Special Operations with Windows 7** - Windows occasionally disrupts programs that were fully functional with Windows XP. Two known issues with Stream Selector Valve operations have work-arounds, as discussed below.

a. Disconnection of communications on COMM port connection to Control Module – the SSV program loses its ability to open up this connection when the computer is rebooted. Performing the steps indicated in Hint 3.c. reestablishes the hook up.

b. SampleList Operating mode discussed in Hint 7.a. fails to fully execute properly. With Windows 7, the second mode in Hint 7.b. should be followed exclusively.

9. **Installation of replacement valve -** Alignment of multi-position valves are preset at the factory with a key and slot determining the precise rotational positioning.
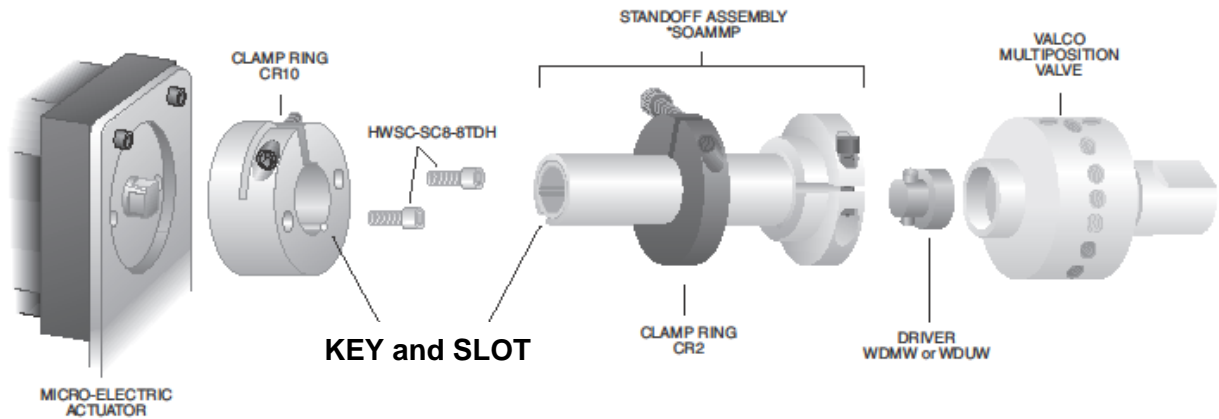

Prior to removal of the actuator from the existing valve assembly, the position should be set to "1" to ensure that the reinstallation aligns as expected. To validate the position of the Multiposition Valve, a pressure source can be applied to position 1 inlet and then flow verified on the common outlet of the valve.[7] A knob (Valco P/N WMMASO) can be used to tweak the valve rotation to its proper position and permit the actuator to fully fit into place.
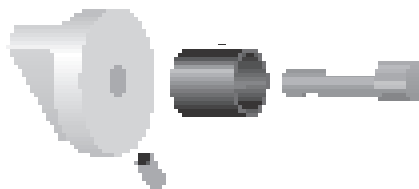
During reinstallation of the actuator, the clamp ring CR10 must be fully engaged with the standoff assembly and then secured tightly to prevent any opportunity for it to uncouple during operations.

10. **Changing Valco Control Module parameter, especially after installation of new SSV valve -** Brand new detached VICI Multiposition Actuator Control Modules (black box usually mounted on the back of the GC) are normally factory-set to 10-position valve operations. If a different number of ports are employed (typically 16-positions), then the new Module must be set to agree with the valve configuration. Using the Manual Controller usually mounted on the face of Large Valve Oven with Velcro, shift into the setup mode by depressing the STEP and HOME switches together for 8 seconds. The position display LED's will begin to flash, showing the current setting for the total number of positions in a full rotation. Use the STEP switch to increase or the HOME switch to decrease the setting to the desired value. To return to the operating mode, depress both switches until the LED's stop blinking.

---
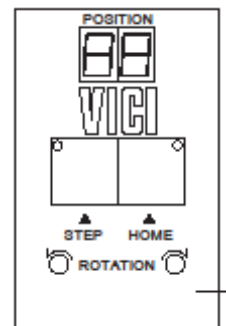
[7] If a sample vacuum pump is installed, it should be turned off for this test.

11. **Diagnostic log file - Debug = 1** - To help in troubleshooting errors in operations of the SSV program, a log file can be created that documents send commands and data received for each step in the process. This is set through SSVAuto.ini in the Workstation directory by changing the preset parameter "Debug = 0" to "Debug = 1".

```
[StarSSV]
AdvanceDelay=5000
ReadTimeOut=300

[Instrument1]
Label=GC1
Port=1
PurgeTime=0.2
ValveCount=1
ValveID1=
ValveSize1=16
Address=0
ValveConfiguration=2
StayOnTop=0
Debug=1
```

As a result, a log file - "ssvlog1" - is created in the Workstation folder and lists all commands and information received during every operation of the SSV. This file can become huge if left active, and should only be turned on if unexpected issues occur during normal operations. An example is shown below:

```
12/31/2010 10:49:35 AM: Method: C:\BrukerWS\Randy.mth
12/31/2010 10:49:36 AM: WaitTime: 5000
12/31/2010 10:49:36 AM: Valve Configuration: 2
12/31/2010 10:49:36 AM: ValveCount 1: 1
12/31/2010 10:49:36 AM: PurgeTime 1: 0.200000002980232
12/31/2010 10:49:36 AM: ValveID 1:
12/31/2010 10:49:36 AM: ValveSize 1: 16
12/31/2010 10:49:36 AM: Command Parms: 1 15 0.00 C:\BrukerWS\Randy.smp 1
12/31/2010 10:49:36 AM: sPosnList item: 15
12/31/2010 10:49:36 AM: Positioning CommOut 1: GO15 12/31/2010 10:49:36 AM: Positioning CommOut 1 Bytes Written: 5
12/31/2010 10:49:41 AM: Verifying CommOut 1: CP 12/31/2010 10:49:41 AM: Verifying CommOut 1 Bytes Written: 3
12/31/2010 10:49:41 AM: Verifying 1 Bytes Received: 8
12/31/2010 10:49:41 AM: Verifying 1 Data Received: 0POSITION IS  = 15
12/31/2010 10:52:23 AM: Method: C:\BrukerWS\Randy.mth
12/31/2010 10:52:24 AM: WaitTime: 5000
12/31/2010 10:52:24 AM: Valve Configuration: 2
12/31/2010 10:52:24 AM: ValveCount 1: 1
12/31/2010 10:52:24 AM: PurgeTime 1: 0.200000002980232
12/31/2010 10:52:24 AM: ValveID 1:
12/31/2010 10:52:24 AM: ValveSize 1: 16
12/31/2010 10:52:24 AM: Command Parms: 1 4 0.00 C:\BrukerWS\Randy.smp 1
12/31/2010 10:52:25 AM: sPosnList item: 4
12/31/2010 10:52:25 AM: Positioning CommOut 1: GO4 12/31/2010 10:52:25 AM: Positioning CommOut 1 Bytes Written: 4
12/31/2010 10:52:30 AM: Verifying CommOut 1: CP 12/31/2010 10:52:30 AM: Verifying CommOut 1 Bytes Written: 3
12/31/2010 10:52:30 AM: Verifying 1 Bytes Received: 8
12/31/2010 10:52:30 AM: Verifying 1 Data Received: 0POSITION IS  = 4
12/31/2010 10:54:23 AM: Method: C:\BrukerWS\Randy.mth
12/31/2010 10:54:24 AM: WaitTime: 5000
```

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