VICI Valco valves: Connecting, Sequencing & Troubleshooting Information

**1.0 Introduction**

This small ‘manual’ provides details and advice on connecting, sequencing and troubleshooting the VICI Valco valves for new users. The VICI Valco valves control the flow of ambient air sampling from the 12 chambers.

**2.0 Connection**

The connection between the VICI Valco valves needs to be set up every time the TDLwintel program is restarted.

Connecting the VICI Valco valves in the TDLwintel program on the QCLAS computer:

1. Open the Command Tab in the TDLwintel program
2. Open Com Port in the scroll-down menu (Figure 1)
3. In the ‘Serial Port Assignments’ pop-up window (Figure 2) assign VICI #1 and VICI #2 to the correct Com Ports. The program automatically recommends Com Ports 7 and 8; however, this is not definitive and could change (you may need to check the Com Port connection in the QCLAS computer’s Device Manager)
4. At the time of writing, the VICIs were assigned to Com Ports 6 & 7. Please remember this can change, and the user may have to try different Com Ports
5. As a side note, currently, TDLwintel automatically assigns the ‘OASIS Com Port’ to a Com Port, specifically COM 5, please change this to none (Figure 2). Note, this may change with newer versions of TDLwintel
6. Implement the changes in the ‘Serial Port Assignments’ pop-up window and press quit
7. To check the VICIs are now connected, return to the Command Tab
8. In the scroll-down menu, hover over the ‘Control Valves etc.’ option and then select ‘Control VICI valve....’
9. Now, in the ‘VICI Manual Adjustment’ pop-up window, the VICIs should be shown to be connected by the two green squares beside the respective Com Ports (Figure 3) (**please note, you will have to open and close this ‘VICI Manual Adjustment’ pop-up window once before it updates with the changes made from Step 3**)
10. Lastly, as a final check, the VICIs should now be manually controllable from this pop-up window by selecting the different numbers of the circle shown in the ‘VICI Manual Adjustment’ pop-up window (Figure 3)

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Figure 1: How to open the Com Port console to assign the VICI Valco valves and ensure the QCLAS computer (in TDLwintel) and VICIs are communicating.

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Figure 2: The Serial Port Assignment pop-up window where the VICI Com Ports are assigned.

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Figure 3: How to open and control the VICI Valco valves manually in TDLwintel

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Figure 4: The VICI Manual Adjustment pop-up window where the VICIs are manually controlled and working connection can be observed in TDLwintel.

**3.0 Sequencing**

Sequencing the VICI Valco valves also needs to be completed every time the TDLwintel programme is restarted.

1. Open the Command Tab in TDLwintel
2. In the scroll-down menu, hover over the ‘Schedule…’ option and select the ‘Schedule VICI valve…’ option
3. A ‘Scheduler for VICI Multi-Position Valve’ pop-up window will open and here you can schedule and sequence the VICI valves (a sequencing information sheet has already been produced by Matti Barthel - [matti.barthel@usys.ethz.ch](mailto:matti.barthel@usys.ethz.ch) – however, a brief overview will be provided)
4. In the pop-up window, 10 ‘Scheduling boxes’ are shown (labelled #1 to #10). This is where the VICIs are programmed to a desired schedule or routine. Within each box, there are several settings, including:
   * **Interval (s)**: the total time in seconds of the overall sequence/routine and how often it will repeat
   * **Duration (s)**: the total time in seconds of an individual sequence (e.g., if 1 represents VICI valve port and the duration is set to 60 seconds, 1 = 60 seconds, so 1, 1 = 60 s, 60 s (Figure 6))
   * **Starting time (hh:mm:ss)**: the starting time in which the set program in the ‘Scheduling boxes’ will begin
   * **Sequence**: The VICI Valco valve port's desired sequence/routine is programmed here. The duration in which the user wants a VICI valve port to stay open is set by inputting X number of the respective VICI valve port labels (i.e., if the user wants VICI port 1 to stay open for 4 minutes (and the duration is set to 60 seconds) then the user would input the following: **1,1,1,1)**
   * **The total time set in the ‘Sequence’ box must equal the interval time, or else TDLwintel will crash as the sequence/routine is run**
   * The **‘Sequence’** box can only handle a maximum of 75 characters, so if the desired sequence/routine requires more than this, the sequence must be split using the ‘Scheduling boxes’ (#1 to #10)
   * When the sequence/routine uses multiple ‘Scheduling boxes,’ the programming becomes slightly more complex:
     + If the **interval (s)** of the total sequence/routine has to last, for example, for 86400 s and the sequence uses two ‘Scheduling boxes,’ Box #1 and Box #2
     + The **duration (s)** of the two boxes must equate to the **interval (s)** time, for example:
       - If the **duration** is 60 s for Scheduling Box #1 and the VICI valve port 1 is programmed to be: 1,1 (total 120 s or 2 mins)
       - Then the **duration** in the Scheduling Box #2 must be 86280 s with the sequence of the VICI valve port 2 programmed to be: 2 (total 86280 s)
     + This must also be reflected in the **starting time,** for example:
       - If the starting time of Box #1 is set to 12:00:00 (and the program VICI valve port 1 is set to 120 s or 2 minutes)
       - Then the starting time of Box #2 must be set to 12:02:00
5. Finally, once the sequence/routine has been programmed, press ‘Implement’ to save and toggle ‘Start Now’ if you want to begin the sequenced program (**and once again press the ‘Implement’ button**)
6. At the time of writing, the VICI valve ports 1 to 12 do not refer to the chambers as chambers 1 to 12, for example:
   * **VICI valve port 5** refers to chamber 1
   * **VICI valve port 16** refers to column 12
   * However, this may be updated in the future

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Figure 5: How to open the scheduler for the VICIs in TDLwintel

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Figure 6: The scheduler for the VICIs Multi-Position Valve pop-up window where the VICI schedule /routine is programmed in TDLwintel

**4.0 Troubleshooting**

Here, some tips and advice are provided for troubleshooting the VICI Valco valves in case of malfunction or disconnection.

* If during the connection stage, the Com Ports for VICI #1 and VICI #2 cannot be found, search for the correct Com Ports in the QCLAS computer’s Device Manager, which will display the physical Com Ports of QCLAS computer connected to the communication port box that the VICI valves are connected
* In the Device Manager pop-up window, select the ‘Ports (COM & LPT)’ option, and here you should find the listed communication ports for the VICI Valco valves (Figure 7)
* If the VICI Valco valves appear to be connected and communicating with the QCLAS computer on TDLwintel, but are still not working correctly:
  + First, try turning the VICI Valco valves on and off by pulling out the black power cable plugged into the back of the valve units
  + If this does not work, have a look at the physical communication port box to see if all the connection ports are working correctly
  + For example, a real-world scenario occurred where:
    - Port 1 of the physical communication port box was flashing orange/red (suggesting a port malfunction)
    - Therefore, the VICI Valco valve connections were moved to ports 2 and 3 (from ports 1 and 2)
    - The port light was now green (suggesting a secure and stable connection)
  + After this, you may need to reassign the comports in the QCLAS computer’s Device Manager

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Figure 7: The Device Manager pop-up window where the VICI Com Ports can be found.