

{ APP NOTE }



Integrating Volume Checking with Mosaic Software

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THE BENEFITS OF VOLUME CHECKING OPERATIONS

Accurately measuring solution volumes in tubes or plate wells is an essential requirement for some laboratories, for reasons such as:

- Verifying volumes on receipt of sample deliveries, so any discrepancies can be reported back
- Auditing tube solution stocks periodically to verify availability
- Quality control check for assay plates

A range of volume detection equipment is available, which provides rapid and reliable readings. Volume checking devices are usually faster than using capacitance detection on a liquid handler. However, to use volume detection or tube auditor equipment most efficiently, it should be linked to your sample management software and inventory system so that:

- The volumes recorded are automatically updated in your inventory without manual file handling, which is a common source of errors
- Any inventory action required, such as restocking, can be triggered when the new volumes are recorded

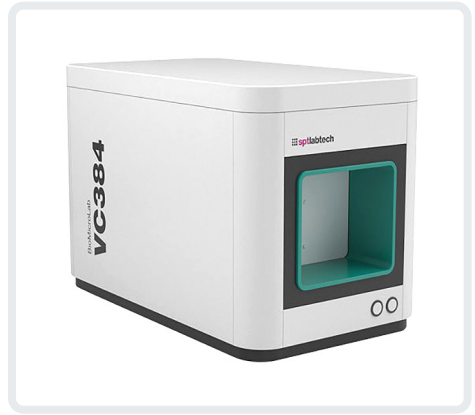
Titian Software offers a Volume Checking application which integrates volume detection instruments with Mosaic inventory to provide an easy solution for capturing this data either as part of a workflow or as a standalone operation.

COMPATIBLE DEVICES AND OPERATIONS

Currently Mosaic software supports the following devices from Azenta Life Sciences and SPT Labtech:

- Tube Auditor™ from Azenta Life Sciences
- BioMicroLab VolumeCheck series from SPT Labtech





Volume checkers can be used as standalone instruments, but being able to integrate and automate the process provides significant efficiencies when trying to audit larger numbers of samples.

Titian's Volume Checking application gives users the choice of:

- add a volume check workflow step to a Mosaic order so it is carried out every time the order is run
- running an ad hoc volume check whenever it is needed

The output files created by the volume detecting instrument are monitored by Mosaic so that when data associated with the instrument appears, the volume information in the workflow and Mosaic inventory are updated automatically.

If the volume checking instrument also detects precipitates, such as the Azenta Tube Auditor, then this information is passed through to the Mosaic software and flagged with the user.

USE CASE 1: UPDATING TUBE VOLUMES USING A MOSAIC ORDER

Adding the volume check operation to the Mosaic order ensures it is run every time. This might be to check volumes before an assay is run, or after liquid handling or a solubilization run to confirm volumes.

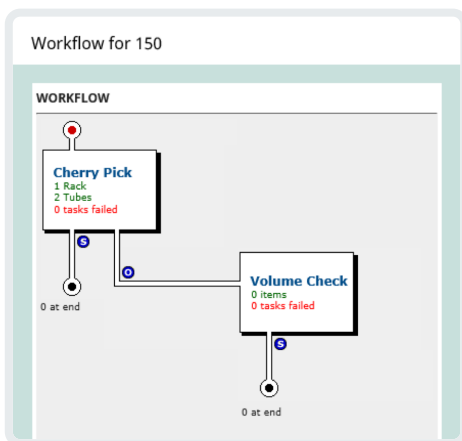


Mosaic's Workflow screen (right) shows a Mosaic order for a Cherry Pick transfer of solution from two source tubes into two new tubes, which then have an enforced Volume Check operation.

After completion of the Cherry Pick step, the operator can select all tubes requiring the volume check and create a run for the volume detection instrument to measure the tube volumes.

For any tubes that have active pending Volume Check runs, Mosaic updates the inventory volumes and labels the Run as complete. For tubes where there is a significant volume variance from the expected volume, the operator can choose to either Complete (accept) the updated information or Skip (ignore) it, before then confirming acceptance of the Run results.

In the example below, the volume checker has detected precipitate as well as a significant volume difference, so both are reported to the operator.



The screenshot, titled "Work For Operations", shows a table of operations for "2 SOURCES". The table has columns for "Order/Source", "Output 1", "Volume Check", "Type", and "Skip".

Order/Source	Output 1	Volume Check	Type	Skip
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Volume Check	Inventory Update	-1
<input checked="" type="checkbox"/> 150 - Volume Check				
<input checked="" type="checkbox"/> Tube 01@Rack 1/A03	● Pending			
<input checked="" type="checkbox"/> Tube 02@Rack 1/B03	● Pending			

Below the table are buttons for "Create Run", "Fail", "Complete", and "Export". At the bottom, there is a "Machine:" dropdown set to "Tube Auditor" and an "Ok" button.

The screenshot, titled "Imported Results for Volume Check Run 17", shows a table of results under the heading "RESULTS".

Source	Output 1
	Volume Check Type: Inventory Update Skip: -1
Rack 1,A03	■ Valid
Rack 1,B03	■ Warning - Measured volume = 35, inventory volume = 40. Precipitate. (Select action) ▾

At the bottom of the results table are "Confirm" and "Cancel" buttons.



USE CASE 2: AD-HOC TUBE VOLUMES UPDATE

Volume Check runs can also be carried out on an ad hoc (non order) basis, without requiring an explicit Mosaic order workflow step. This might be done to carry out a monthly audit of stocks, rather than every time samples are requested.

As Mosaic monitors the volume detection instrument's swept folder, it will automatically update the tube volume information in inventory when a new output file appears. If measured volumes differ by more than a configurable percentage, a list of run details are presented to an operator to review.

RUNS

Run Id	Order Id	Run Type	Operator	Created	Transfers	State	
18	Ad hoc	Volume Check	BUILTIN\Administrators	05-Feb-2019	2	Pending Review	
17	150	Volume Check	DEMOMOSAICSB8 \Administrator	05-Feb-2019	2	Completed	↓
15	Ad hoc	Volume Check	BUILTIN\Administrators	05-Feb-2019	2	Cancelled	↓
14	149	Volume Check	DEMOMOSAICSB8 \Administrator	05-Feb-2019	2	Completed	↓
13	Ad hoc	Volume Check	BUILTIN\Administrators	05-Feb-2019	2	Cancelled	↓
12	149	Volume Check	DEMOMOSAICSB8 \Administrator	04-Feb-2019	2	Cancelled	↓

The operator can review and processes the individual details of each rack in a run. If the volume checker detects precipitate, this will also be reported.

Imported Results for Ad Hoc run created by File Sweeper Run 18

RESULTS

Source	Output 0
Rack 1,A03	Valid
Rack 1,B03	Warning - Precipitate.

Confirm Cancel Skip

The choice between order-based workflows and ad hoc operations gives each group or lab flexibility in how they work and when these audit operations are run.



SUMMARY

Integrating volume checking with your Mosaic software provides convenient and efficient options for ensuring your inventory is always up to date. It makes quality checks easy to run to ensure:

- your suppliers are providing what you ordered
- your customers are receiving what you promised
- your assay plates meet standards
- your inventory stocks are audited

These all add up to give confidence in your sample quality and thus the integrity of data generated from them.

ABOUT TITIAN SOFTWARE

Titian Software is the industry leader in providing sample management software for the life sciences. Using Mosaic software, our customers see significant benefits in terms of their throughput, response times, error rates, labor costs as well as in sample conservation. Titian has done this by producing an application that can process multiple requests with varying sources, and labware output formats. It can easily be run by any operators, instead of tying up an automation expert to write new protocols. We also use our extensive experience in interfacing laboratory instrumentation and robotic systems with our software to ensure that customers make best use of their investment in research and development technologies.

At Titian Software, our development efforts never stop as we continue to advance Mosaic sample management software toward higher levels of efficiency and practicality for the user. The ongoing collaborative relationship between Titian and hardware vendors continues to ensure that new applications are made available on a timely basis to fulfill our customer's research goals. We pride ourselves on taking into account customer feedback for all of our Mosaic applications to drive our product to be the best it can be. It's all part of Titian's commitment to providing innovative solutions that make life easier for sample management professionals.



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After 16 years as a medicinal chemist at Roche, Paul moved to Organon (later Merck) where he specialised in compound management and automation systems for 10 years. He joined Titian in 2011 as a business application consultant.

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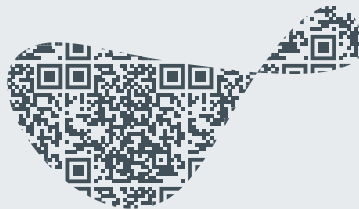


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