No compromise! Combining Quality, Flexibility and Reliability with the new JFM integration for the CyBio Well vario

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Overview

Objective

To establish a seamless connection between the CyBio Well vario liquid handling system and the Mosaic interface using the new JFM integration. This integration aims to enhance the flexibility, reliability, and user-friendliness of liquid handling operations.

Background

Evotec's collection management processes often involve bulk replication and reformatting, utilizing the CyBio Well vario systems from Analytik Jena GmbH & Co. KG. These systems are fully integrated with the LIMS System, Mosaic from Titian Software Ltd, via the FHLH module. Despite robust data handling, the current setup limits flexibility in adjusting liquid handling parameters and device configurations. To address this, a new integration with the Mosaic JFM interface was implemented.

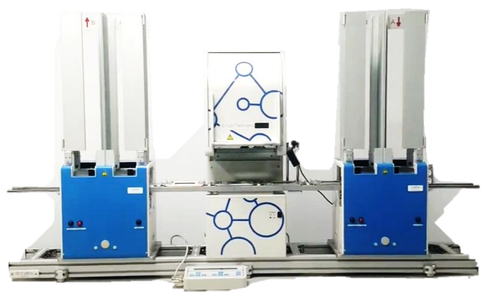
Methods and Application

Integration Focus

The study integrates the CyBio Well vario with Mosaic's new JFM interface, ensuring that Analytik Jena's Fulmarus[3] software controls the device while receiving and sending instructions to and from the Mosaic database, enabling seamless two-way communication.

Hardware: CyBio Well vario from Analytik Jena

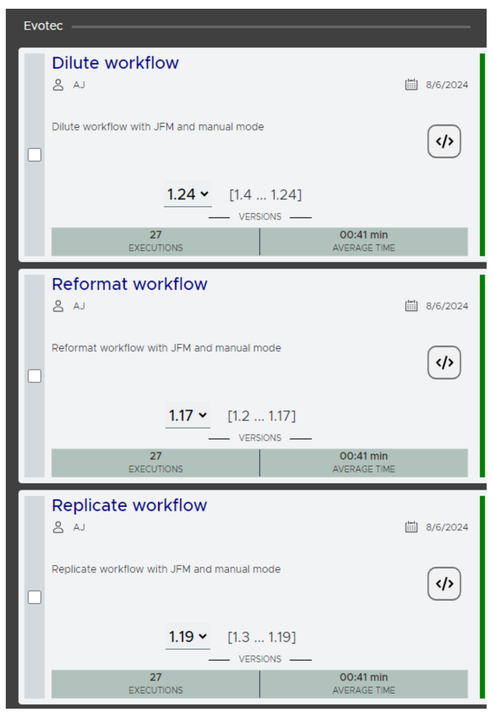
- Semi-Automated pipetting platform with integrated stacker
- Interchangeable pipetting heads (96 and 384 format): Allows for flexibility and adaptability to different task, frequently used for bulk replication and reformatting for collection management
- Current applied volume range: Handles liquid transfers from 2.5 µL to 250 µL



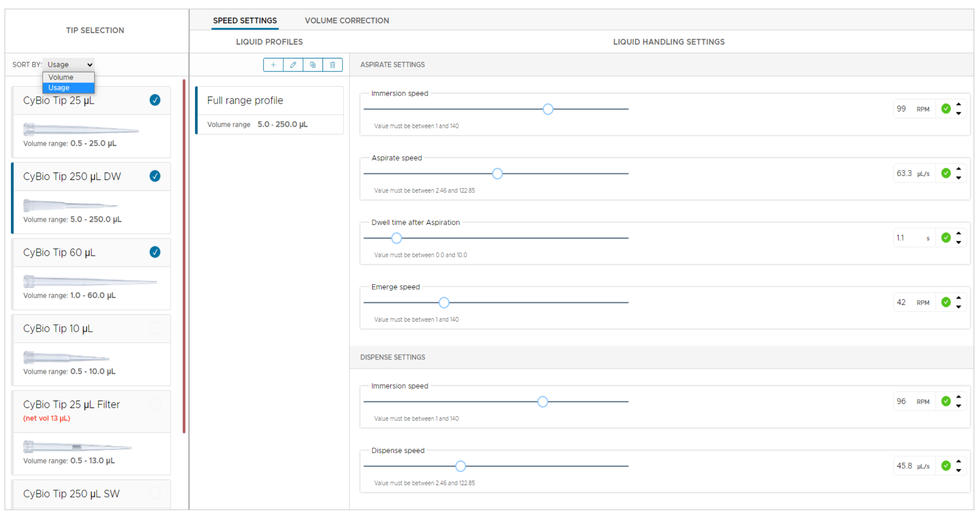
CyBio Well vario from Analytik Jena

Software: Fulmarus from Analytik Jena features:

- Basic functionality settings: Offers the possibility to wash/change tips, check the deck configuration, etc.
- Online protocols: Are integrated via JFM in Mosaic, so that the data of all pipetting steps are transferred to our LIMS system in real time. Errors, or pauses, are considered
- Offline protocols: All our protocols can be used offline, i.e., without the JFM interface. This offers maximum flexibility

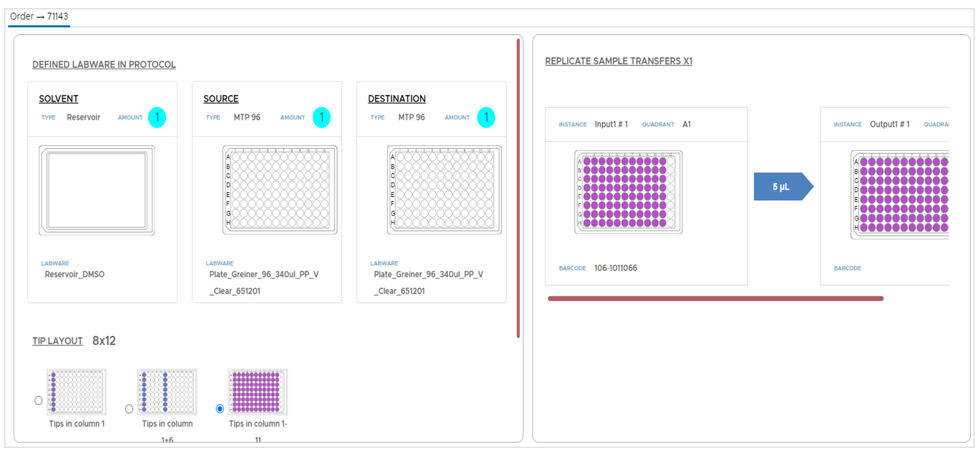


Fulmarus Overview: Supported Protocol Types



Tip Selection / Speed Setting / Volume Correction

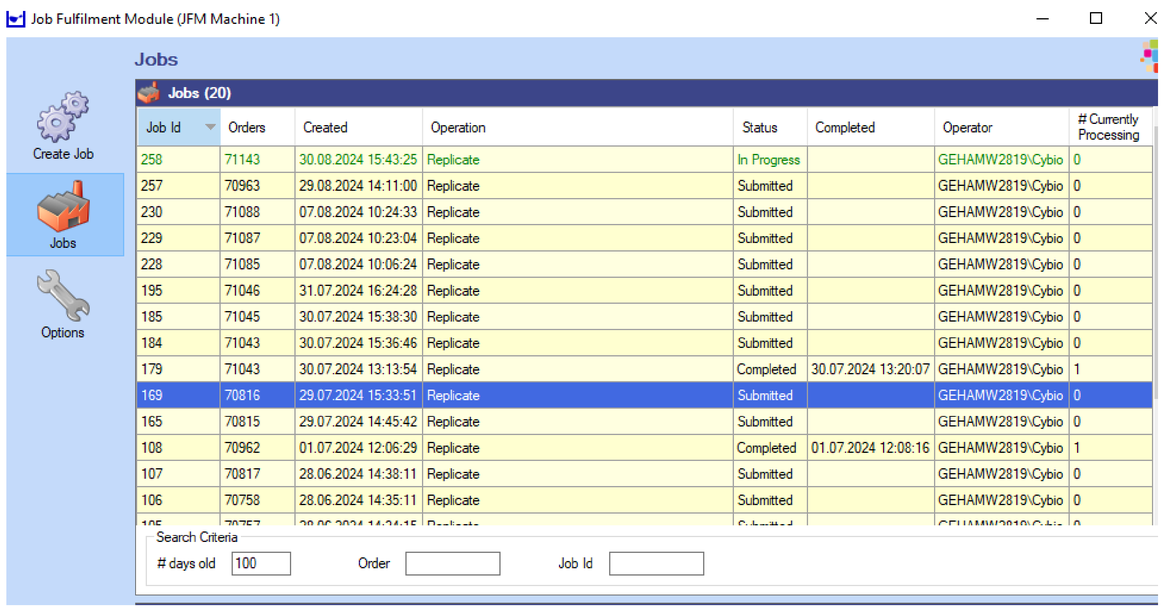
- Optimisation of the protocols: It is possible to set parameters such as blowout, driving speeds, aspiration or dispensing heights, as well as tip touches and much more in a special user area. This enables us to develop all protocols according to our high standards and thus achieve the quality criteria. Additionally, optimization is now possible in both offline and online protocols.



Layout Setup: customized Deck Configuration

Job Fulfilment Module – JFM from Titian Software Ltd[4]

- Integration based on a Mosaic Job API
- Job description is provided in a standard, comprehensive XML format
- Capability to handle multi-step workflows and multiple orders in a single job
- New jobs can be set up while earlier jobs are running / pending
- Driver for specific machine integration can be written by instrument manufacturer, customer, 3rd party or Titian
- Driver (Fulmarus) has full control of liquid handling parameters (e.g. driving speed)

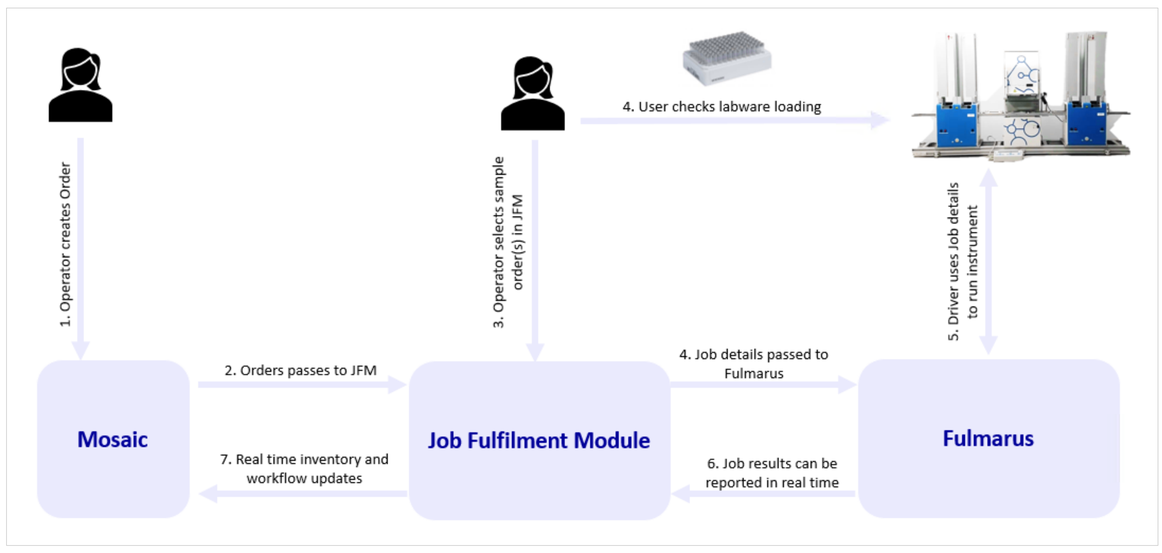


JFM Order(s) Selection Screen

Results

Workflow of the new Integration

- User selects order(s) from those available in JFM application
- JFM application guides the user to create the job
- Fulmarus calls Mosaic Job API to retrieve job details
- CyBio Well vario performs physical run according to job details
- Fulmarus calls the Mosaic Job API to report results
- Mosaic processes the results and updates its Workflow and Inventory



Conclusion and benefits

- Successfully replaced outdated FHLH Modul
- The new JFM integration combined with Fulmarus as Driver offers higher process flexibility and more configuration options (e.g., 5th deck position as suction unit)
- Defined liquid classes per volume range, thereby it is expected that the internally defined volume limit of 2.5µl will be improved to 1µl in the future
- Real-time reports to the database without data loss or data freeze
- Process specific protocols that can be adapted and optimised internally
- Ability to use new devices with different configurations

Acknowledgments

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References and Footnotes

[3] Refers to the pre-software solution specifically developed during this project by Analytik Jena, a device manufacturer and integration provider. This software was created to meet the specific needs of the project and will hereafter be referred to as "Fulmarus."

[4] Job Fulfilment Module (JFM) Overview, from TITIAN-9001-73-1001 – Apr 2021