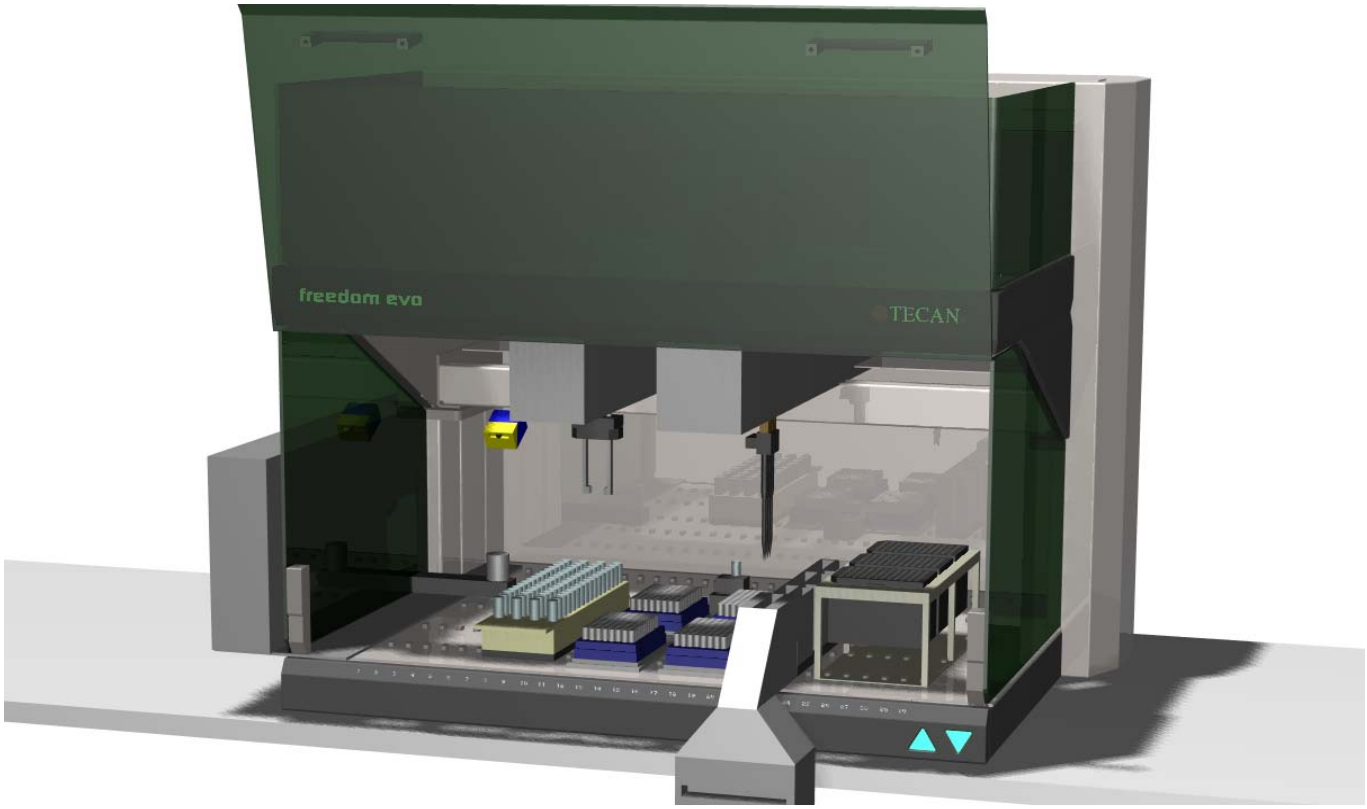
Customized solutions from TIG
(Tecan Integration Group)

Sample Preparation

Biobanking

Space efficient aliquoting and reformatting of blood samples for long term storage

Technical Reference **30019780**



Input

Primary sample tubes

Centrifuged, decapped primary tube with plasma or serum & 1D or 2D barcode on side

BD® Vacutainers or Greiner®, Sarstedt®, Kabe™, Terumo® Tubes with 13mm outer diameter and 75 or 100 mm height

Process

Sample Tracking
Barcode Scanning of 1D Barcodes of all primary tubes

Barcode reading of 1D barcode on destination plates and import of Minitube 2D codes from file

Tube Inspection
Detection of separation layers of the sample tubes with integrated Tube Inspection Unit (TIU)

Aliquoting of blood fractions
Aliquoting and reformatting of serum or plasma fraction into Micronic Tube Racks with the Liquid handling arm.

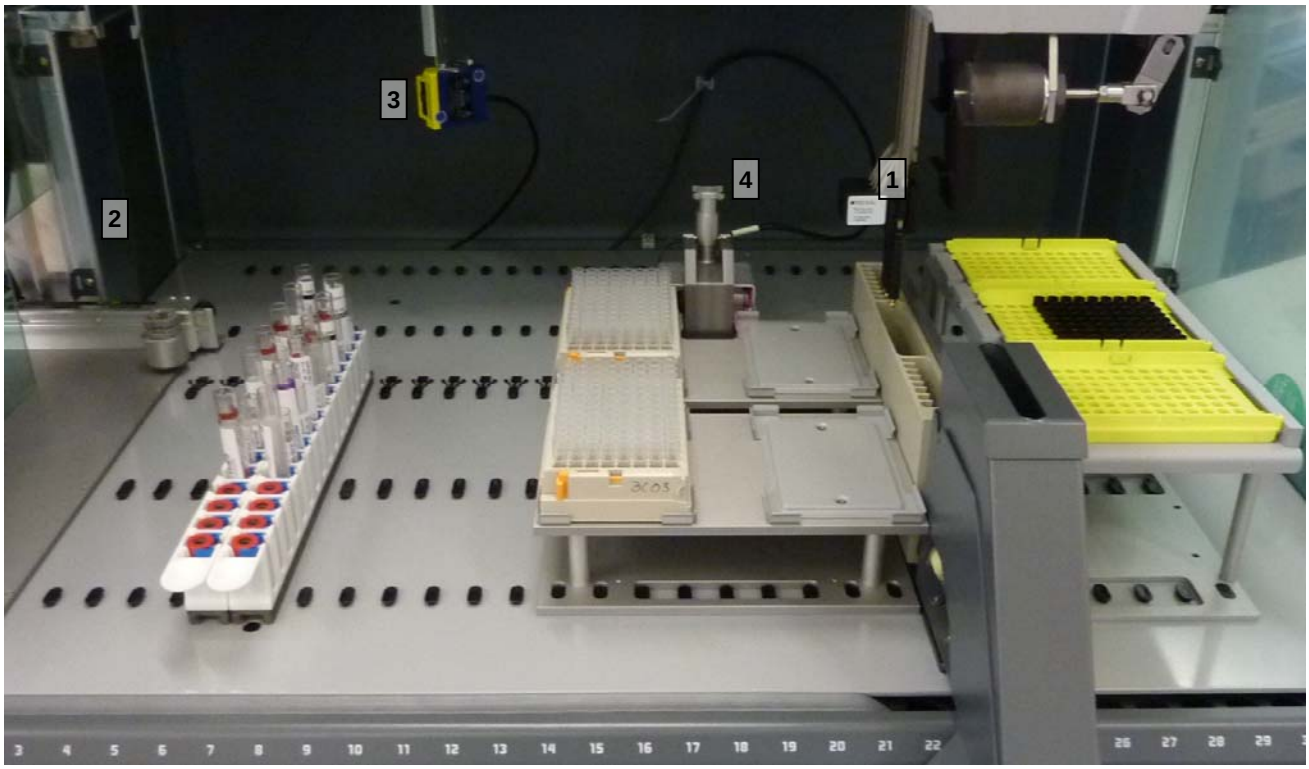
Output

Aliquots of serum / plasma
Up to 8 aliquots of 220 µl per sample tube

Thermo Matrix ®, Micronic®, FluidX® or REMP® 2D barcoded sample tube racks with 1D barcode on side

Platemap report file (CSV)

System Overview



#	Type of module	Brand, model
1.	Automation platform	Tecan Freedom EVO® 100
2.	Tube robot	Efficient and quick transport of sample tubes around the worktable
3.	Liquid handler	4 individual channel (disposable tips) includes automatic liquid level detection
4.	Blood level detection	Tecan TIU (tube inspection unit, module from FE500pro™)
5.	2D code scanner for tubes	Datalogic Matrix 200™ 2D reader
6.	Barcode scanner for racks	Symbol MS954 1D barcodes
7.	Software	Freedom EVOware with sample tracking module

Sample Tracking

Two barcode readers are integrated in the system to allow the reading of all barcodes on the system. Sample tracking:

- Tracks Sample IDs, barcodes, volumes, concentrations & errors through complex pipetting processes
- Monitors pipetting in real-time
- Generates a “CSV Platemap Report” that contains the tube barcode, rack barcode, container position, volume etc. for archiving in electronically or as pdf or printout
- Provides a single, Tecan interface to a LIMS

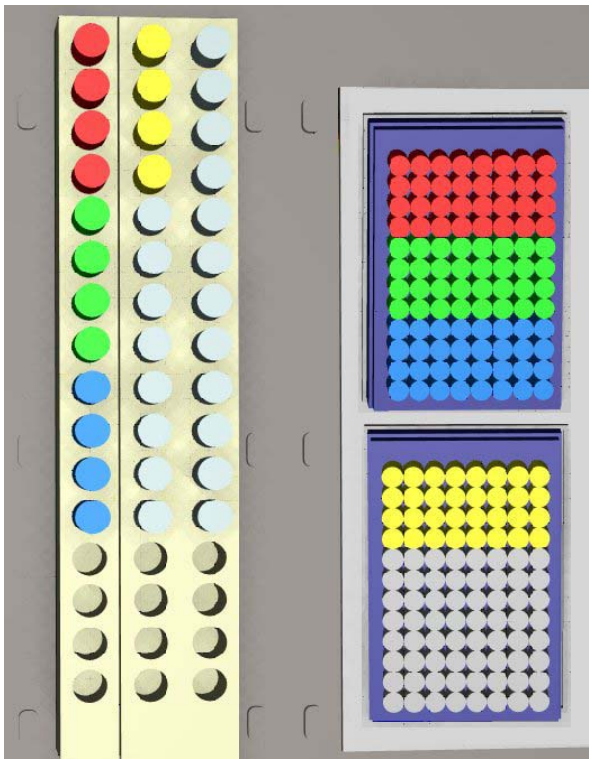
Tube Inspection

The Tube Inspection Unit measures exact liquid volume and enables detection directly through the tube label, eliminating the need for a window on the tube. It determines the separation levels between serum and blood cells or separation gel, and calculates the sample volume available for aliquoting. This will ensure that the Aliquoter won't aspirate into the separation gel or aspirate blood together with serum.

Aliquoting of blood factions

Secondary tube racks are generated using the liquid handling arm, with features such as liquid level detection and clot detection to ensure Tecan‘s renowned pipetting accuracy.

Workflow example

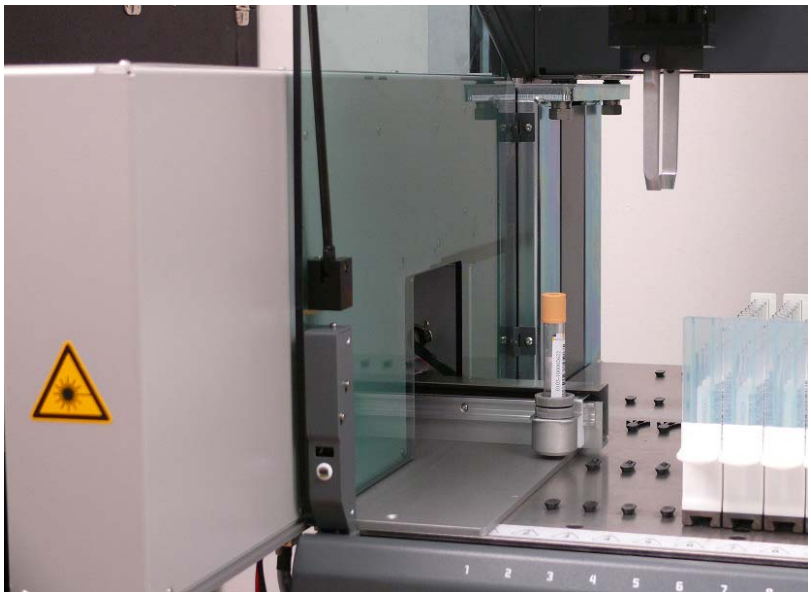


Step by step description of process:

1. Scanning of destination plates on stand-alone Ziath 2D code scanner & generating of rack barcode and Minitube 2D code file
2. Loading of up to 48 primary tubes and up to 4 destination plates on to worktable
3. Start Freedom EVOware run and select number of samples (1-12. 24,36 or48)
4. 1D barcode reading of destination plate
5. Import of Minitube 2D codes from files generated above
6. 2D code reading on primary sample tubes
7. Separation layer detection in tube inspection unit
8. Calculation of possible number of aliquots for each tube
9. Aliquoting maximum number of samples into destination racks
10. Sample tracking report is generated with rack ID, well number and tube ID

Highlights: Customized integration of Tecan modules

Integration of FE500pro Tube Inspection Unit



Technical data:

- Detection of tube bottom, blood cake, gel, serum/plasma and air layers
- Recognition of available sample volume
- Calculation of remaining volume for archiving
- Recognition of separation layers through up to 3 overlapping Barcode Labels. Unique “see-through” capability (patented)
- No reading window required

Process:

- Scanning tubes for reliable identification for different separation layers in the blood samples
- Data are send to Freedom EVOware for calculation of pipetting volumes and heights to allow cell free serum or plasma pipetting
- Remaining volume can be reported to the LIMS

Highlights: 3rd party device integration

Barcode and 2D code scanning

Datalogic Matrix 200™ (1)

Technical data:

- LED lighting system
- image capture engine
- decoder
- multiple communication interfaces
- Ultra compact dimensions

Process:

- Fixed position on the worktable where tubes san be carried to by the tube robot
- Barcode and 2D code scanning of primary sample tubes

Symbol MS954 (2)

Technical data:

- one of the smallest, lightest and brightest fixed-mount scanners
- premium linear scanning on all types of 1D bar codes, including poorly printed and low contrast symbols
- RS-232 serial communication
- Flexible mounting options

Process:

- placed on a holder from which the pick and place arm can pick it up and approach different sites on the worktable for barcode reading
- Barcode scanning of plates at different sites on the worktable

Sample tracking is realized through tube barcode and 2D code reading with a Datalogic Matrix 200™ (1) and plate barcode reading with a MS954 1D Barcode Scanner (2). 2D barcodes on the bottom of 2D barcoded sample storage tubes are read with a stand-alone Ziath 2D code scanner.