{ APP NOTE }

Bringing Easy Sample Traceability to Any Location with Titian's Mosaic Locator

v1.0

titian.co.uk

IMPROVING SAMPLE TRACEABILITY

Reliably tracking and recording the entire life cycle of every sample and reagent as accurately as possible is a key role for Sample Management or LIMS software. This is made significantly easier when LIMS software can automate data exchange with integrated lab equipment. This automated data exchange:

- Removes the burden of tedious sample tracking updates from lab staff
- Improves data accuracy by eliminating errors
- Ensures updates are time stamped and auditable

However, essential manual processes have no automated data exchange and poor sample traceability, making them weak links in the chain of data integrity that labs are working to build. This can also be true of standalone lab equipment which is not integrated with LIMS software.

For these cases, sample location updates are often recorded manually in a separate spreadsheet, which is voluntary. This process provides some traceability, but it comes with disadvantages:

- Entering updates manually is time consuming and prone to human error
- Inventory is updated after the actual event, so samples may have moved on from their recorded location
- There is no validation of where samples have moved to
- Updating the inventory is easy to overlook or bypass if the user is in a hurry
- These methods are not suitable for fully audited environments which may require operations to be accurately time stamped

MOSAIC LOCATOR

Titian's Mosaic Locator provides an auditable way to track samples which is as simple as scanning items at a supermarket checkout.

Locator scans samples' arrival at a location and automatically updates Mosaic inventory using a Zebra DS9308-SR scanner and a Raspberry Pi 3B 'Internet of Things' (IoT) box.

Scanning a barcode automatically validates it by checking against Mosaic's inventory to make sure it is the right sample. Labware information exchanges are validated and any errors, such as an unrecognized barcode, are flagged. This validation occurs in real time.

Sample racks, plates, boxes and tubes are supported, provided their barcodes are compatible with the scanner.

The result is an extremely compact and affordable solution which is easy to install anywhere. Locator's flexibility and simplicity ensures:

- Staff are more likely to update sample locations
- Previously untracked locations can easily be added to the audit trail
- The audit trail is more accurate and data integrity improved
- Locator sites can be updated quickly when lab layouts change

Uses for Locator include:

- Logging samples on arrival at individual lab benches
- Scanning samples as they leave a reagent room
- Tracking samples to lab equipment that isn't otherwise connected to Mosaic's inventory

WHY USE INTERNET OF THINGS (IOT)?

Locator is an IoT box which provides convenient and accurate automatic inventory updates in real time and on the go. Its small footprint uses very little bench space, and its simplicity of use means no training is required.

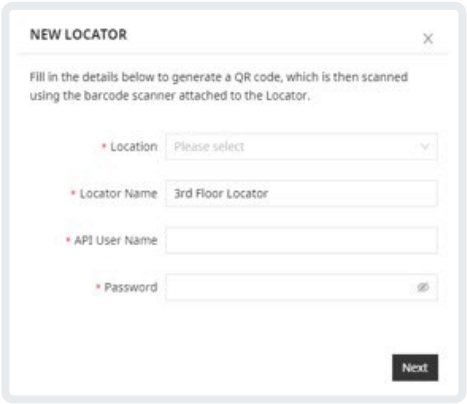
IoT is proven technology often used in hospitals to track people, supplies and equipment to improve workflow, monitor equipment status and reduce the misplacement of devices.

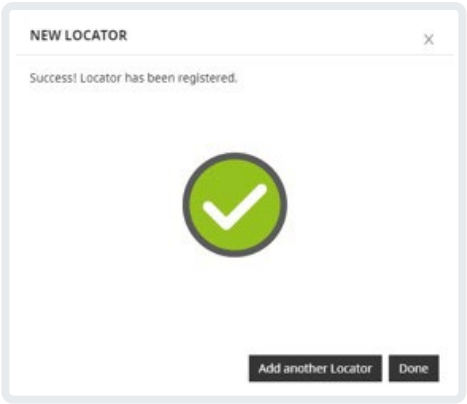
As research laboratories have similar issues, the application of IoT can help to increase lab productivity as well as reduce the waste of time and other resources [1].

SETTING UP LOCATOR

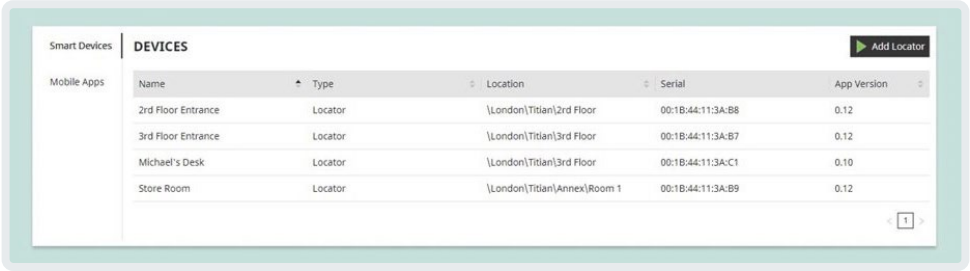
Setting up a new Locator is done simply and securely from a Mosaic web page, using QR codes:

1. Enter details for the new Locator
2. The Mosaic web page generates a QR code
3. Scan the QR code with Locator and it is ready to go





Mosaic's Locator web page makes it easy to view all the locations of connected Locators. These locations are simple to update if the layout of your lab changes.



USE CASE 1: TRACKING SAMPLES TO LAB BENCHES

When moving samples, for instance from a reagent room to a lab bench, simply scanning the labware barcode using the lab bench Locator will automatically update the Mosaic inventory with the new location. The process is as follows:

- Locator sends the barcode to the Mosaic server
- The server validates the barcode and attempts to update its location in Mosaic inventory
- If successful, the scanner flashes green and beeps once to indicate code has been read successfully
- If the barcode is unknown or the move fails, the scanner flashes red and beeps multiple times

USE CASE 2: LAB EQUIPMENT NOT CONNECTED TO MOSAIC

Locator makes it easy to track samples to lab equipment that isn't otherwise integrated with Mosaic's inventory. On arrival, simply scanning the labware barcode with Locator will automatically update the sample location in Mosaic inventory, as follows:

- Locator sends the barcode to the Mosaic server
- The server validates the barcode and attempts to update its location in Mosaic inventory
- If successful, the scanner flashes green and beeps once to indicate code has been read successfully
- If the barcode is unknown or the move fails, the scanner flashes red and beeps multiple times

SUMMARY

Mosaic Locator makes your sample tracking more accurate and efficient by making it very easy for users to do. This brings the following benefits:

- It's so quick and easy to use that no training is needed
- Automated updates reduce staff workloads
- Inventory updates happen in real time
- The time stamped audit trail is suitable for regulated environments
- Sample IDs are validated to ensure you have the correct sample
- Sample traceability is made easy at locations which had been 'untrackable' or prone to error
- Sites of Locators are simple to update if your lab layout changes
- Data quality and repeatability is improved by minimising manual errors
- Regulatory compliance is improved by automatically recording processes in Mosaic's audit trail
- You always know exactly where samples are

Locator's ability to link the movement of samples across all locations to your electronic inventory in real time – and so make these actions traceable and auditable – solves a major unmet need in sample management.

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 have 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.

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

[1]: https://www.technologynetworks.com/tn/articles/how-can-the-internet-of-things-improve-lab-research-335090

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