Laboratory automation: more than moving from here to there

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August 2015—Move it, monitor it, manage it: Hardware and middleware, modules, and interfaces dominate the developments from at least five manufacturers of systems in this year's product guide to laboratory automation systems and workcells—Beckman Coulter, Siemens, Sarstedt, Inpeco, and Cerner. The guide also includes four systems from a company new to the guide—IDS in Kumamoto, Japan—and additions from Aim Labs, Ortho-Clinical Diagnostics, Roche, and Beckman Coulter.

The new system from Beckman Coulter, for example, is the Power Express high-speed automated sample processing system. It combines Beckman Coulter's AU clinical chemistry system, the UniCel DxI 800 immunoassay system, hematology workcell connection, and third-party connection capabilities including for coagulation. It received 510(k) clearance in September 2014.
The system uses intelligent sample management to route samples and radio-frequency identification tube routing that allows for instrument connections on both sides of the track. It provides barcode sample reading at each sample aspiration and maintains accuracy with positive patient identification.

To optimize throughput, all Power Express components operate at the same high-speed pace. The system's dynamic inlet serves as the highest capacity single point of entry for samples. The Power Express has refrigerated and ambient storage, is finished with a specimen automated disposal unit, and uses a scalable, modular layout.

In June, Siemens introduced version 15 of the CentraLink Data Management System, "an automation-ready middleware solution," says John Gillespie, Siemens' director of media and public relations. Version 15 offers an optional Advanced Hematology module, which reduces manual steps typical of a hematology laboratory, centralizes information, and provides a comprehensive overview of the hematology testing process. The solution integrates data and workflow between Siemens hematology systems and automation solutions and, optionally, CellaVision analyzers. With the configurable iExpert button, standard lab practice guidelines can be viewed and implemented. Historical data, cytograms, scattergrams, and CellaVision images can be viewed from one data management system.

Quality control enhancements in the standard version 15 of CentraLink include the ability to filter for, view, and batch action patient results between two QC events. In addition, if a QC result for a test in a panel or used in a calculation formula fails, CentraLink can be configured to hold all patient results for related tests. The patient moving average batch size is now configurable per test, Gillespie says, allowing the laboratory to define a more clinically significant patient moving average population.

Siemens introduced in February the Syngo Lab Inventory Manager, which automates laboratory inventory management processes across multiple laboratories within a network in real time using cloud-based technology and wireless RFID.

Inpeco introduced in 2014 new modules for its FlexLab Automation System. The Bulk Output module unloads and sorts tubes in bulk. A High Volume Storage module provides a protected, cool, and monitored environment in which to store high volumes of sample tubes coming from the automation system. The module is equipped with a fast output unit and a multi-gripper robot that can load 10 tubes at a time into 400-tube-capacity racks; its throughput capacity is 7,200 tubes per hour with a maximum capacity of 554,400 tubes. Tube retrieval and disposal are fully automated.

A Vertical Transportation module connects two automation systems located on different floors or levels. The module connects the two systems for "a fully automated passage of the sample tubes between the two systems

and a correct transfer of the information associated with them," Alessio Sacchettini, Inpeco's product manager, says. Within the next year, FlexLab will be equipped with a module for hemolysis, icterus, and lipemia (HIL) indices detection, Sacchettini says.

The company plans to launch in October its first liquid-handling robot, LHR-LAS, which is integrated into the FlexLab via a connection on both laboratory automation and laboratory information systems. LHR-LAS can be customized for such applications as advanced aliquotting processes, sample preparation for liquid chromatography-mass spectrometry, sample preparation for molecular biology, and ELISA tests.

The first market release of LHR-LAS will be tailored to advanced aliquotting processes for biobanking. In this configuration, a pipetting arm with eight independent pipettes will be equipped with disposable tips and filters, and a second arm equipped with a gripper will ensure the manipulation of all consumables needed for the bioprotocols implementation. The consumables will be stored in a dedicated Consumables Manager module, which, with the aid of a gripper arm, will be able to feed the proper consumable requested by the sample preparation protocol.

Sacchettini says a new interface for Inpeco's urinalysis/sedimentation analyzer, the AUWII interface, will be released this December.

Siemens and Inpeco on July 28 signed a contract that extends their partnership in laboratory automation. They will be working together to design and deliver custom solutions.
Cerner in the past year developed interfaces to the Beckman Coulter 5800 series and DxI and Siemens Centaur, each one built in partnership with the instrument manufacturer, says Jennifer Walker, Cerner's marketing program manager, laboratory medicine. Cerner plans this year to develop instrument interfaces to BioRad BioPlex 2200, Stago Evolution, Vitros 3600, Sysmex XN9000, and Roche Cobas 8000.

The company introduced in 2014 a Manual Processing Station, which is a module for workflows that demand direct technologist handling, individually or in bulk. "It helps migrate these specimens on and off the automation line while minimizing the impact on other specimens on the line," Walker says. New touchscreen dashboards show real-time system status and go beyond specimen location status to provide operational data and statistics, she adds.

Sarstedt introduced last September its optional Pick and Place module, which Peter Rumswinkel, the company's VP/general manager, says enables full automation connectivity to a track system. "Our goal is to offer standalone or automation options to accommodate labs and budgets of any size," he says.

Systems from the aforementioned companies and from Abbott, m-u-t America, Sysmex, and Yaskawa can be found in CAP TODAY's guide to lab automation systems and workcells, which begins on page 25. Readers interested in a particular system should confirm it has the stated features and capabilities.
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