

## Chemistry analyzers for mid- and high-volume laboratories

### Delivering lean, green, fast, and flexible

While laboratories continue to want more of the usual from their chemistry and chemistry/immunoassay analyzers—accuracy, reliability, and automation—they also want less: less noise, less heat, less reagent and water use, and systems that require less space, says Carolina Liquid Chemistries' executive vice president Patricia A. Shugart, BS, MT, MBA.

Carolina is responding to this demand and others with its CLC720 floor-model chemistry analyzer, which received FDA 510(k) clearance on March 23. Shugart says the system requires approximately 40 percent less reagent, 30 percent less water, less electricity, and 20 percent less space than most floor models in its class. It analyzes 100 different blood chemistry tests, including glucose, cholesterol, and drugs of abuse, and, overall, performs 720 tests per hour (400 photometric and 320 ion-selective electrode) using the latest software, electronics, motion control, and fluidics.

Carolina's CLC720, CLC480, and BioLis 24i analyzers are profiled in the following pages, along with other mid- and high-volume chemistry and chemistry/immunoassay systems from Abbott Diagnostics, Awareness Technology, Beckman Coulter, Ortho-Clinical Diagnostics, Randox Laboratories, Roche Diagnostics, Siemens Healthcare Diagnostics, and The Binding Site.

Like Shugart, Maureen Zetlmeisl, product manager for The Binding Site, notes the increasing popularity of environmentally friendly analyzer design, reporting that her customers are seeking "instrumentation that is 'green' and reduces their carbon footprint," and "fits into their Lean laboratory workflow." Automation, of course, remains a chief focus: "There is a trend to move more and more to automation and away from semiautomated or manual tests," Zetlmeisl says. The Binding Site recently added albumin, C3, C4, haptoglobin, and prealbumin automated assays to the test menu of its fully automated, high-throughput SPA Plus analyzer, which has been available since 2007. Several other assays will be added to the system later this year, she says.

Beckman Coulter's customers want instrumentation that is fast, can handle workload increases, and is easy to use, says marketing manager Stephen Ishii, who adds that they expect reliable, uninterrupted service. The company's newest line of chemistry analyzers, the AU5800 series, is geared toward very-high- to ultra-high-volume labs. It received FDA 510(k) premarket clearance last December. Making up the AU5800 series are the AU5810, AU5820, AU5830, and AU5840 analytical units, each of which has a sample tray inlet, integrated rerun rack buffer unit for automatically repeating critical samples, and special priority rack ports for stat-interrupt sampling, Ishii says. The 5810 and 5820 are for core hospital labs, while the 5830 and 5840 are for commercial reference labs. Each unit can be used as a stand-alone analyzer or connect with the company's automation solutions and potentially integrate with its clinical information systems and immunoassay testing platforms to meet workflow needs.

Like Zetlmeisl, Colin Hill, Ortho-Clinical Diagnostics' worldwide director of systems and automation marketing, sees a continuing focus on automation in the chemistry analyzer market. Which is why the company launched last year its Vitros 4600 chemistry system for mid- to high-volume clinical laboratories. The system's automation-ready interface enables users to standardize and consolidate testing by combining with the company's Vitros 3600 immunodiagnostic and Vitros 5600 integrated systems on Ortho's enGen laboratory automation system. The Vitros 4600 includes MicroSlide technology, which allows it to operate independent of water supply and drainage and provide results with 95 percent reportable result efficiency, he says. MicroTip technology provides special chemistry menu offerings and user-defined assays, while MicroSensor technology boosts efficiency and controls costs by automatically detecting and flagging issues with patient samples, without compromising turnaround time or operator workflow. Other system features include IntelliCheck technology, which allows real-time process monitoring to minimize erroneous result reporting, and the e-Connectivity interactive management system, which provides real-time access to remote repair information.

Abbott Diagnostics continues to offer its Architect family of chemistry and chemistry/immunoassay analyzers, which now have new software, faster processing speeds, smaller footprints, and integration capabilities for seamless connection of clinical chemistry and immunoassay, says Shar Batley, U.S. marketing, diagnostics. "There is a continued need for consolidation and increased efficiency, yet scalability and the choice of flexibility with automation," Batley says, noting that the trend is for platforms that offer high throughput and increased productivity. The Architect family of instruments was designed with Six Sigma metrics, she says.

The companies that market these and other instruments provided the data displayed on pages 32–58.

—Brendan Dabkowski, associate editor

Part 1 of 14	<b>MID</b>	Abbott Diagnostics Shar Batley sharon.batley@abbott.com 100 Abbott Park Rd., Abbott Park, IL 60064 847-938-2348 www.abbottdiagnostics.com
See captodayonline.com/productguides for an interactive version of guide		
<b>Name of instrument/First year sold in U.S.</b> <b>List price/Total No. sold in 2011</b> <b>Number of units in clinical use in U.S./Outside U.S.</b> <b>Where designed/Manufactured/Where reagents manufactured</b> <b>Operational type/Reagent type</b>		ARCHITECT c4000 and ci4100/2009 c4000: \$180,000; ci4100: \$275,000/— 318 (c4000) 639 (i1000sr)/655 (c4000), 3,410 (i1000sr) U.S., Japan/U.S., Japan /U.S., Ireland, Germany continuous random access/self-contained multi-use cartridges, open reagent system
<b>Sample handling system/Model type</b>		three-dimensional robotic sample handler/floor standing
<b>Dimensions in inches (H × W × D)/Footprint in square feet</b>		c4000: 49 × 63 × 36/21; ci4100: 49 × 111 × 36/37
<b>Number of tests for which analyzer has FDA-cleared applications</b> <b>Tests released for clinical use in last 12 months</b>		143 (86 clinical chemistry and 57 immunoassay) vitamin D, B12, carbamazepine, gentamicin
<b>Tests cleared but not released for clinical use</b> <b>Tests not available in U.S. but submitted for 510(k) clearance</b> <b>Tests not available in U.S. but available in other countries</b>		active-B12 HAVAB and testosterone AFP, proGRP, SCC, anti-HAV IgG, CMV IgG and IgM, rubella IgG and IgM, toxo IgG and IgM, CMV avidity, toxo avidity, HCV Ag, pepsinogen I and II, NGAL, kappa light chain, lambda light chain, cholinesterase, cystatin C, magnesium (enzymatic), others —
<b>Research-use-only assays</b> <b>Tests in development</b>		anti-HAV IgG, HbA1c, methotrexate, Tg, AFP, magnesium (enzymatic)
<b>Methodologies supported/Immunoassay methodologies</b>		photometry, potentiometry, turbidimetric/ chemiluminescence with flexible protocols
<b>Number of direct ion-selective electrode channels</b> <b>Number of different measured assays onboard simultaneously</b> <b>Number of different assays programmed and calibrated at once</b> <b>Number of user-definable (open) channels/Number active simultaneously</b> <b>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</b> <b>Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported</b> <b>Reagent container placed directly on system for use</b> <b>Instrument has same capabilities when third-party reagents used</b> <b>Walkaway capacity in minutes/Specimens/Tests or assays</b>		3 c4000: 58; ci4100: 83 c4000: 220; ci4100: 320 220/220 c4000: varies/50–1,700; ci4100: varies/ 50–1,700 chemistry, 100 immunoassay 7 days/28 days/yes (2°–8°C) yes yes yes c4000: —/100/62,000+; ci4100: —/180/64,000+
<b>Uses disposable cuvettes/Maximum number stored</b> <b>Uses washable cuvettes/Replacement frequency</b> <b>Minimum sample volume aspirated precisely at one time</b> <b>Supplied with UPS (backup power)/Requires floor drain</b> <b>Requires dedicated water system/Water consumption per hour</b> <b>Noise generated in decibels</b>		no (chemistry) and yes (immunoassay)/300 yes, chemistry/minimum 1-year guarantee 2 µL yes/no yes/15 L normal operation: ≤48; peak: 70 for maximum 10 seconds yes/50 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interl., Codabar, codes 39 and 128)/yes yes, 2-D bar codes yes
<b>Dedicated pediatric sample cup/Dead volume</b> <b>Primary tube sampling/Pierces caps on primary tubes</b> <b>Sample bar-code reading capability/Autodiscrimination</b>		yes yes/yes/yes yes/yes yes yes (for chemistry) yes yes, for chemistry only/yes 24 hours/30 days/7 days/14 days no/no
<b>Reagent bar-code reading capability</b> <b>Bar code placement per CLSI standard Auto2A</b>		yes yes/yes/yes yes/yes yes yes (for chemistry) yes yes, for chemistry only/yes 24 hours/30 days/7 days/14 days no/no
<b>Onboard test auto inventory (determines volume in container)</b> <b>Measures number of tests remaining/Short sample detection/Clot detection</b> <b>Hemolysis/Turbidity detection-quantitation</b> <b>Sample volume can be reduced</b> <b>Increased to rerun out-of-linear-range high/low results</b> <b>Autocalibration or autocalibration alert</b> <b>Calibrants stored onboard/Multipoint calibration supported</b> <b>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</b> <b>Automatic shutdown programmable/Startup programmable</b>		yes yes/yes/yes yes/yes yes yes (for chemistry) yes yes, for chemistry only/yes 24 hours/30 days/7 days/14 days no/no
<b>Stat time to completion of all analytes and throughput per hour for:</b> • Sodium, potassium, chloride, TC02		2.6 minutes ISE, 5.9 minutes with TC02; 200 specimens, 800 tests
• Sodium, potassium, chloride, TC02, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP <b>Typical time delay from ordering stat test to aspiration of sample</b> <b>How often QC required/Onboard SW capability to review QC</b> <b>Onboard real-time QC/Support multiple QC lot numbers per analyte</b> <b>System can automatically transfer QC results to LIS</b>		8.3 minutes, 80 specimens, 560 tests 9.8 minutes, 67 specimens, 400 tests <20 seconds shortest interval: 8 hours; longest: 24 hours/yes yes/yes yes
<b>Data-management capability/Instrument vendor supplies LIS interface</b>		yes (additional cost, SW manufacturer: Abbott)/ optional, at additional cost
<b>Interfaces to what LISs up and running in active user sites</b>		Cerner, Misys, Fletcher Flora, Data Innovations, Soft, CPSI, Meditech, Siemens, Triple G, CIS, others
<b>Bidirectional interface capability</b> <b>Uses LOINC to transmit orders and results across interface</b> <b>How labs get LOINC codes for reagent kits</b>		yes (broadcast download and host query) — package insert
<b>Interface available (or will be) to automated specimen-handling system</b>		no
<b>Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component</b> <b>On-site time of service engineer</b> <b>Mean time between failures/Mean time to repair failures</b> <b>Average time to complete maintenance by lab personnel</b>		yes/yes/yes per negotiated contract 26 weeks (c4000), 26 weeks (i1000sr)/varies daily: <15 minutes; weekly: <35 minutes; monthly: <15 minutes
<b>Onboard maintenance records/Maintenance training demo module</b> <b>Training provided with instrument purchase</b>		yes/yes yes
<b>Distinguishing product features (supplied by company)</b>		integration of CC and IA without compromising stat turnaround time, results, or throughput; robotic sample handler design with SmartWash technology allows IA and CC testing in any order for overall turnaround time; features standardized across Architect instruments for consistent user experience, reduced variation in operator procedures; large reagent, routine, and stat sample load-up capacity for efficient processing of samples for patient results; refer to operations manual for operational precautions, limitations, and hazards; class 1 laser product

Note: a dash in lieu of an answer means company did not answer question  
or question is not applicable

## Chemistry analyzers for mid- and high-volume laboratories

Part 2 of 14	<b>MID</b>	<b>HIGH</b>	<b>MID</b>
<p>See <a href="http://captodayonline.com/productguides">captodayonline.com/productguides</a> for an interactive version of guide</p>	<p><b>Abbott Diagnostics</b> Shar Batley sharon.batley@abbott.com 100 Abbott Park Rd., Abbott Park, IL 60064 847-938-2348 www.abbottdiagnostics.com</p>	<p><b>Abbott Diagnostics</b> Shar Batley sharon.batley@abbott.com 100 Abbott Park Rd., Abbott Park, IL 60064 847-938-2348 www.abbottdiagnostics.com</p>	<p><b>Awareness Technology Inc.</b> Walter Arenas (Int'l), Jamie Ristaino (U.S.) info@awaretech.com P.O. Box 1679, Palm City, FL 34991 772-283-6540 www.awaretech.com</p>
<p>Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type</p>	<p>ARCHITECT c8000 and ci8200/2003 c8000: \$200,000/15; ci8200: \$375,000/25 364 (c8000), 498 (i2000sr)/1,875 (c8000), 6,527 (i2000sr) U.S., Japan/U.S., Japan/U.S., Ireland, Germany continuous random access/self-contained multi-use cartridges, open reagent system</p>	<p>ARCHITECT c16000 and ci16200/2007 c16000: \$325,000/98; ci16200: \$475,000/3 35 (c16000) 498 (i2000SR)/474 (c16000) 6,527 (i2000sr) U.S., Japan/U.S., Japan/U.S., Ireland, Germany continuous random access/open reagent system</p>	<p>ChemWell 2902, 2910/1999 starts at \$20,000/500+ 80+/3,200+ U.S./U.S./— batch, random access, continuous random access/ open reagent system rack/benchtop</p>
<p>Sample handling system/Model type</p>	<p>three-dimensional robotic sample handler/floor standing</p>	<p>three-dimensional robotic sample handler and carousel/floor standing</p>	<p>rack/benchtop</p>
<p>Dimensions in inches (H × W × D)/Footprint in square feet</p>	<p>c8000: 48 × 79 × 49/26; ci8200: 48 × 127 × 49/42</p>	<p>c16000: 48 × 79 × 49/26; ci16200: 48 × 127 × 49/42</p>	<p>19 × 36 × 22/7</p>
<p>Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months Tests cleared but not released for clinical use Tests not available in U.S. but submitted for 510(k) clearance</p>	<p>143 (86 clinical chemistry and 57 immunoassay) vitamin D, B12, carbamazepine, gentamicin active-B12 HAVAB and testosterone</p>	<p>143 (86 clinical chemistry and 57 immunoassay) vitamin D, B12, carbamazepine, gentamicin active-B12 HAVAB and testosterone</p>	<p>22 — — 18 EIA kits manufactured by BioCheck have been submitted</p>
<p>Tests not available in U.S. but available in other countries</p>	<p>AFP, proGRP, SCC, anti-HAV IgG, CMV IgG and IgM, rubella IgG and IgM, toxo IgG and IgM, CMV avidity, toxo avidity, HCV Ag, pepsinogen I and II, NGAL, kappa light chain, lambda light chain, cholinesterase, cystatin C, magnesium (enzymatic), others</p>	<p>AFP, proGRP, SCC, anti-HAV IgG, CMV IgG and IgM, rubella IgG and IgM, toxo IgG and IgM, CMV avidity, toxo avidity, HCV Ag, pepsinogen I and II, NGAL, kappa light chain, lambda light chain, cholinesterase, cystatin C, magnesium (enzymatic), others</p>	<p>open system</p>
<p>Research-use-only assays Tests in development</p>	<p>— anti-HAV IgG, HbA1c, methotrexate, Tg, AFP, magnesium (enzymatic)</p>	<p>— anti-HAV IgG, HbA1c, methotrexate, Tg, AFP, magnesium (enzymatic)</p>	<p>open system —</p>
<p>Methodologies supported/Immunoassay methodologies</p>	<p>photometry, potentiometry, turbidimetric/chemiluminescence with flexible protocols</p>	<p>photometry, potentiometry (ISE), turbidimetric/chemiluminescence with flexible protocols (Chemiflex)</p>	<p>photometry/microwell assays</p>
<p>Number of direct ion-selective electrode channels</p>	<p>3</p>	<p>3</p>	<p>0</p>
<p>Number of different measured assays onboard simultaneously</p>	<p>c8000: 68; ci8200: 93</p>	<p>c16000: 68; ci16200: 93</p>	<p>27 standard, 44 optional</p>
<p>Number of different assays programmed and calibrated at once</p>	<p>c8000: 220; ci8200: 320</p>	<p>c16000: 220; ci16200: 320</p>	<p>unlimited</p>
<p>Number of user-definable (open) channels/Number active simultaneously</p>	<p>220/220</p>	<p>220/220</p>	<p>unlimited/27 standard, 44 optional</p>
<p>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</p>	<p>c8000: 65/50–1,700; ci8200: 90/50–1,170 (chemistry), 100–500 (immunoassay)</p>	<p>c16000: 65/50–1,700 (chemistry); ci16200: 93/50–1,700 (chemistry), 100–500 (immunoassay)</p>	<p>27 standard, 44 optional/reagent-dependent</p>
<p>Shortest/Median onboard reagent stability/Refrigerated onboard</p>	<p>7 days/28 days/yes (2°–8°C)</p>	<p>7 days/28 days/yes (2°–8°C)</p>	<p>reagent-dependent/—/yes (15°C below ambient) optional</p>
<p>Multiple reagent configurations supported</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>Reagent container placed directly on system for use</p>	<p>yes</p>	<p>yes</p>	<p>reagent dependent</p>
<p>Instrument has same capabilities when third-party reagents used</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>Walkaway capacity in minutes/Specimens/Tests or assays</p>	<p>c8000: —/215/69,000+; ci8200: varies/365/81,000–93,000</p>	<p>c16000: —/215/69,000+; ci16200: varies/365/81,000–93,000</p>	<p>not limited/96/not limited</p>
<p>Uses disposable cuvettes/Maximum number stored</p>	<p>no (chemistry) and yes (immunoassay)/1,200</p>	<p>no (chemistry) and yes (immunoassay)/1,200</p>	<p>yes (optional)/96</p>
<p>Uses washable cuvettes/Replacement frequency</p>	<p>yes, chemistry/minimum 1-year guarantee</p>	<p>yes/minimum 1-year guarantee</p>	<p>yes (optional)/weekly</p>
<p>Minimum sample volume aspirated precisely at one time</p>	<p>2 µL</p>	<p>2 µL</p>	<p>2 µL</p>
<p>Supplied with UPS (backup power)/Requires floor drain</p>	<p>yes/no</p>	<p>yes/yes</p>	<p>no/no</p>
<p>Requires dedicated water system/Water consumption per hour</p>	<p>yes/30.5 L</p>	<p>yes/59 L</p>	<p>no/&lt;1 L</p>
<p>Noise generated in decibels</p>	<p>normal operation: ≤48; peak: 70 for maximum 10 seconds</p>	<p>normal operation: ≤48 peak; 70 for maximum 10 seconds</p>	<p>60</p>
<p>Dedicated pediatric sample cup/Dead volume</p>	<p>yes/50 µL</p>	<p>yes/50 µL</p>	<p>no/—</p>
<p>Primary tube sampling/Pierces caps on primary tubes</p>	<p>yes/no</p>	<p>yes/no</p>	<p>yes/no</p>
<p>Sample bar-code reading capability/Autodiscrimination</p>	<p>yes, on sample transport, shortly before sample is aspirated (2 of 5 interl., Codabar, codes 39 and 128)/yes</p>	<p>yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes</p>	<p>yes, by handheld scanner as tubes are loaded onto instrument (2 of 5 interl., UPC, Codabar, codes 39 and 128)/autodiscrimination depends on handheld scanner models</p>
<p>Reagent bar-code reading capability</p>	<p>yes, 2-D bar codes</p>	<p>yes, 2-D bar codes</p>	<p>no</p>
<p>Bar code placement per CLSI standard Auto2A</p>	<p>yes</p>	<p>yes</p>	<p>no</p>
<p>Onboard test auto inventory (determines volume in container)</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>Measures number of tests remaining/Short sample detection/Clot detection</p>	<p>yes/yes/yes</p>	<p>yes/yes/yes</p>	<p>yes/yes/no</p>
<p>Hemolysis/Turbidity detection-quantitation</p>	<p>yes/yes</p>	<p>yes/yes</p>	<p>no/no</p>
<p>Sample volume can be reduced</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>Increased to rerun out-of-linear-range high/low results</p>	<p>yes (for chemistry)</p>	<p>yes (for chemistry)</p>	<p>no</p>
<p>Autocalibration or autocalibration alert</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>Calibrants stored onboard/Multipoint calibration supported</p>	<p>yes, for chemistry only/yes</p>	<p>yes/yes</p>	<p>yes/yes</p>
<p>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</p>	<p>24 hours/30 days/7 days/14 days</p>	<p>24 hours/30 days/7 days/14 days</p>	<p>user-defined for all</p>
<p>Automatic shutdown programmable/Startup programmable</p>	<p>no/no</p>	<p>no/no</p>	<p>yes/yes</p>
<p>Stat time to completion of all analytes and throughput per hour for:</p>	<p>• Sodium, potassium, chloride, TC02 2.6 minutes ISE, 5.9 minutes with TC02; 200 specimens, 800 tests</p>	<p>• Sodium, potassium, chloride, TC02; 2.6 minutes ISE, 5.9 minutes with CO2; 200 specimens, 800 tests</p>	<p>—</p>
<p>• Sodium, potassium, chloride, TC02, glucose, urea, creatinine</p>	<p>8.3 minutes, 160 specimens, 1,120 tests</p>	<p>8.3 minutes, 200 specimens, 1,400 tests</p>	<p>—</p>
<p>• Albumin, direct and total bilirubin, AST, ALT, ALP</p>	<p>9.8 minutes, 133 specimens, 800 tests</p>	<p>9.8 minutes, 200 specimens, 1,200 tests</p>	<p>5.5 minutes, 28 specimens</p>
<p>Typical time delay from ordering stat test to aspiration of sample</p>	<p>&lt;20 seconds</p>	<p>&lt;20 seconds</p>	<p>15 seconds</p>
<p>How often QC required/Onboard SW capability to review QC</p>	<p>shortest interval: 8 hours; longest: 24 hours/yes</p>	<p>shortest interval: 8 hours; longest: 24 hours/yes</p>	<p>reagent-dependent/yes</p>
<p>Onboard real-time QC/Support multiple QC lot numbers per analyte</p>	<p>yes/yes</p>	<p>yes/yes</p>	<p>yes/yes</p>
<p>System can automatically transfer QC results to LIS</p>	<p>yes</p>	<p>yes</p>	<p>yes</p>
<p>Data-management capability/Instrument vendor supplies LIS interface</p>	<p>yes (additional cost, SW manufacturer: Abbott)/optional, at additional cost</p>	<p>optional add-on (additional price varies; SW manufacturer: Abbott)/optional, at additional cost</p>	<p>onboard/yes (included in price)</p>
<p>Interfaces to what LISs up and running in active user sites</p>	<p>Cerner, Misys, Fletcher Flora, Data Innovations, Soft, CPSI, Mediatech, Siemens, Triple G, CIS, others</p>	<p>Cerner, Misys, Fletcher Flora, Data Innovations, Soft, CPSI, Mediatech, Siemens, Citation, CHCS, Antek, Orchard, others</p>	<p>—</p>
<p>Bidirectional interface capability</p>	<p>yes (broadcast download and host query)</p>	<p>yes (broadcast download and host query)</p>	<p>yes (broadcast download)</p>
<p>Uses LOINC to transmit orders and results across interface</p>	<p>—</p>	<p>—</p>	<p>no</p>
<p>How labs get LOINC codes for reagent kits</p>	<p>package insert</p>	<p>package insert</p>	<p>supplied by reagent manufacturer</p>
<p>Interface available (or will be) to automated specimen-handling system</p>	<p>yes</p>	<p>yes</p>	<p>no</p>
<p>Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component</p>	<p>yes/yes/yes</p>	<p>yes/yes/yes</p>	<p>yes/yes/sometimes</p>
<p>On-site time of service engineer</p>	<p>per negotiated contract</p>	<p>per negotiated contract</p>	<p>48 hours</p>
<p>Mean time between failures/Mean time to repair failures</p>	<p>23 weeks (c8000), 13 weeks (i2000sr)/varies</p>	<p>18 weeks (c16000), 13 weeks (i2000sr)/varies</p>	<p>depends on user and varies/depends on problem and varies</p>
<p>Average time to complete maintenance by lab personnel</p>	<p>daily: 15 minutes; weekly: &lt;45 minutes; monthly: 15 minutes</p>	<p>daily: 15 minutes; weekly: &lt;45 minutes; monthly: 15 minutes</p>	<p>daily: &lt;5 minutes; weekly: about 15 minutes; monthly: about 30 minutes or less</p>
<p>Onboard maintenance records/Maintenance training demo module</p>	<p>yes/yes</p>	<p>yes/yes</p>	<p>no/no</p>
<p>Training provided with instrument purchase</p>	<p>yes</p>	<p>5 days on site, 5 days at company offices</p>	<p>2 days on site, 3 days at company offices</p>
<p>Distinguishing product features (supplied by company)</p>	<p>integration of CC and IA without compromising stat turnaround time, results, or throughput because of robotic sample handler design and SmartWash technology, which minimizes carryover to &lt;0.1 ppm; 93-reagent capacity, with sample load up to 365; multiple patented technologies; refer to operations manual for operational precautions, limitations, and hazards; class 1 laser product</p>	<p>high-speed integration of CC and IA without compromising stat turnaround time, results, or throughput due to robotic sample handler design and SmartWash technology, which minimizes carryover to &lt;0.1 ppm; 93-reagent capacity, with sample load up to 365; Chemiflex and FlexRate technologies provide assay extended linearities and enhanced sensitivities; refer to operations manual for operational precautions, limitations, and hazards; class 1 laser product</p>	<p>one instrument for EIA and biochemistry; open and user-programmable; discounts for biochemistry only; calculates indices; flexible formatting of reports</p>

Note: a dash in lieu of an answer means company did not answer question or question is not applicable

## Chemistry analyzers for mid- and high-volume laboratories

Part 3 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>HIGH</b>	Beckman Coulter Stephen Ishii scishii@beckman.com 250 S. Kraemer Boulevard, Brea, CA 92821 714-993-5321 www.beckmancoulter.com	<b>HIGH</b>	Beckman Coulter Stephen Ishii scishii@beckman.com 250 S. Kraemer Boulevard, Brea, CA 92821 714-993-5321 www.beckmancoulter.com	<b>HIGH</b>	Beckman Coulter Stephen Ishii scishii@beckman.com 250 S. Kraemer Boulevard, Brea, CA 92821 714-993-5321 www.beckmancoulter.com
Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	AU5840 Clinical Chemistry System/2012 \$845,107 (no ISE), \$884,008 (single ISE), \$890,163 (dual ISE) 2/7 Japan/Japan/U.S., Japan, Ireland random access, discrete, continuous random access/ open rack/floor-standing	AU5830 Clinical Chemistry System/2012 \$683,845 (no ISE), \$754,922 (single ISE), \$731,457 (dual ISE) 1/7 Japan/Japan/U.S., Japan, Ireland random access, discrete, continuous random access/ open rack/floor-standing	AU5820 Clinical Chemistry System/2012 \$473,826 (no ISE), \$514,933 (single ISE), \$521,437 (dual ISE) 3/47 Japan/Japan/U.S., Japan, Ireland random access, discrete, continuous random access/ open rack/floor-standing			
Dimensions in inches (H × W × D)/Footprint in square feet	50 × 210 × 62/90.42	50 × 168 × 62/72.33	50 × 126 × 62/54.25			
Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months	125 —	125 —	125 —			
Tests cleared but not released for clinical use Tests not available in U.S. but submitted for 510(k) clearance Tests not available in U.S. but available in other countries	— — —	— — —	— — —			
Research-use-only assays Tests in development	— —	— —	— —			
Methodologies supported/Immunoassay methodologies	photometry, potentiometry, calculated tests/ homogeneous	photometry, potentiometry, calculated tests/ homogeneous	photometry, potentiometry, calculated tests/ homogeneous			
Number of direct ion-selective electrode channels Number of different measured assays onboard simultaneously Number of different assays programmed and calibrated at once Number of user-definable (open) channels/Number active simultaneously Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set	0 (indirect ISE) 120 120 120/120 216/100–4,000	0 (indirect ISE) 120 120 120/120 162/100–4,000	0 (indirect ISE) 111 120 120/120 111/100–4,000			
Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when third-party reagents used Walkaway capacity in minutes/Specimens/Tests or assays	120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 400/varies	120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 400/varies	120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 400/varies			
Uses disposable cuvettes/Maximum number stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption per hour Noise generated in decibels	no/— yes/permanent 1.0 µL yes/yes yes/248 L <60	no/— yes/permanent 1.0 µL yes/yes yes/180 L <60	no/— yes/permanent 1.0 µL yes/yes yes/124 L <60			
Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	yes/100 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	yes/100 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	yes/100 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes			
Reagent bar-code reading capability Bar code placement per CLSI standard Auto2A	yes yes	yes yes	yes yes			
Onboard test auto inventory (determines volume in container) Measures number of tests remaining/Short sample detection/Clot detection Hemolysis/Turbidity detection-quantitation Sample volume can be reduced Increased to rerun out-of-linear-range high/low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse Automatic shutdown programmable/Startup programmable	yes yes/yes/yes yes/yes yes/yes yes yes no/yes 1 day/30 days/14 days/14–20 days yes/yes	yes yes/yes/yes yes/yes yes/yes yes yes no/yes 1 day/30 days/14 days/14–20 days yes/yes	yes yes/yes/yes yes/yes yes/yes yes yes no/yes 1 day/30 days/14 days/14–20 days yes/yes			
Stat time to completion of all analytes and throughput per hour for: • Sodium, potassium, chloride, TC02	4–9 minutes, 267 specimens	4–9 minutes, 267 specimens	4–9 minutes, 267 specimens			
• Sodium, potassium, chloride, TC02, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP Typical time delay from ordering stat test to aspiration of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot numbers per analyte System can automatically transfer QC results to LIS	4–9 minutes, 267 specimens 9 minutes, 267 specimens 1 minute per CLIA and laboratory's decision yes/yes yes	4–9 minutes, 267 specimens 9 minutes, 267 specimens 1 minute per CLIA and laboratory's decision yes/yes yes	4–9 minutes, 267 specimens 9 minutes, 267 specimens 1 minute per CLIA and laboratory's decision yes/yes yes			
Data-management capability/Instrument vendor supplies LIS interface	onboard/no	onboard/no	onboard/no			
Interfaces to what LISs up and running in active user sites	all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC	all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC	all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC			
Bidirectional interface capability Uses LOINC to transmit orders and results across interface How labs get LOINC codes for reagent kits	yes, broadcast download and host query no —	yes, broadcast download and host query no —	yes, broadcast download and host query no —			
Interface available (or will be) to automated specimen-handling system	yes	yes	yes			
Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component On-site time of service engineer Mean time between failures/Mean time to repair failures Average time to complete maintenance by lab personnel	yes/yes/yes <24 hours <4 calls per year/<24 hours daily: 5 minutes; weekly: 42 minutes; monthly: 15 minutes	yes/yes/yes <24 hours <4 calls per year/<24 hours daily: 5 minutes; weekly: 42 minutes; monthly: 15 minutes	yes/yes/yes <24 hours <4 calls per year/<24 hours daily: 5 minutes; weekly: 42 minutes; monthly: 15 minutes			
Onboard maintenance records/Maintenance training demo module Training provided with instrument purchase	yes (includes audit trail)/yes 3–5 days on site, 5 days at company offices	yes (includes audit trail)/yes 3–5 days on site, 5 days at company offices	yes (includes audit trail)/yes 3–5 days on site, 5 days at company offices			
Distinguishing product features (supplied by company)	speed: throughput of up to 9,800 tests per hour (with dual ISE); standardization with the AU family of chemistry systems (AU480 and AU680)—same reagent inventory, operating software, test results, and reference ranges for improved patient management and streamlined operation; reduced sampling volume; enhanced options for reflex, repeat, pre-dilution, autocalibration, auto QC, and multi-lot advanced calibration	speed: throughput of up to 7,800 tests per hour (with dual ISE); standardization with the AU family of chemistry systems (AU480 and AU680)—same reagent inventory, operating software, test results, and reference ranges for improved patient management and streamlined operation; reduced sampling volume; enhanced options for reflex, repeat, pre-dilution, autocalibration, auto QC, and multi-lot advanced calibration	speed: throughput of up to 5,800 tests per hour (with dual ISE); standardization with the AU family of chemistry systems (AU480 and AU680)—same reagent inventory, operating software, test results, and reference ranges for improved patient management and streamlined operation; reduced sampling volume; enhanced options for reflex, repeat, pre-dilution, autocalibration, auto QC, and multi-lot advanced calibration			

*Note: a dash in lieu of an answer means company did not answer question or question is not applicable*

## Chemistry analyzers for mid- and high-volume laboratories

Part 4 of 14	<b>HIGH</b>	<b>MID</b>	<b>MID</b>
	<b>Beckman Coulter</b> Stephen Ishii scishii@beckman.com 250 S. Kraemer Boulevard Brea, CA 92821 714-961-3139 www.beckmancoulter.com	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Boulevard Brea, CA 92821 714-961-6698 www.beckmancoulter.com	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Boulevard Brea, CA 92821 714-961-6698 www.beckmancoulter.com
Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type Sample handling system/Model type Dimensions in inches (H × W × D)/Footprint in square feet	AU5810 Clinical Chemistry System/2012 \$266,331 (no ISE), \$307,448 (single ISE), \$313,943 (dual ISE) 3/72 Japan/Japan/U.S., Japan, Ireland random access, discrete, continuous random access/ open rack/floor-standing 50 × 85 × 62/36.60	AU480/2009 \$140,000/— >235/800 Japan/Japan/U.S. and Ireland random access, discrete, continuous random access/ open reagent system rack and stat carousel/floor standing 47.5 × 57.1 × 30/11.9	AU680/2008 \$213,000/30 350/>800 Japan/Japan/U.S. and Ireland random access, discrete, continuous random access/ open reagent system rack and stat carousel/floor standing 50 × 76 × 45/23.7
Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months Tests cleared but not released for clinical use Tests not available in U.S. but submitted for 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays Tests in development	125 — — — — — —	125 — — — — — —	125 — — — — — —
Methodologies supported/Immunoassay methodologies Number of direct ion-selective electrode channels Number of different measured assays onboard simultaneously Number of different assays programmed and calibrated at once Number of user-definable (open) channels/Number active simultaneously Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when third-party reagents used Walkaway capacity in minutes/Specimens/Tests or assays Uses disposable cuvettes/Maximum number stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination Reagent bar-code reading capability Bar code placement per CLSI standard Auto2A	photometry, potentiometry, calculated tests/ homogeneous 0 54 120 120/120 54/100–4,000 120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 400/varies no/— yes/permanent 1.0 µL yes/yes yes/62 L 60 no/— yes/100 µL yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes yes yes	photometry, potentiometry, calculated tests/ homogeneous 3 up to 63 120 117/60 76/100 to 1,333 5 days/30 days/yes (4°–12°C) yes yes yes varies/up to 102/varies no/— yes/permanent 1 µL no (optional)/yes (no with optional water pump) yes/20 L average peak consumption 60 no/— yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes yes yes	photometry, potentiometry, calculated tests/ homogeneous 3 up to 63 120 116/60 63/100 to 1,500 120 hr/30 days/yes (4°–12°C) yes yes yes varies/up to 172/varies no/— yes/permanent 1 µL no (optional)/yes (no with optional water pump) yes/28 L peak consumption 60 no/— yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes yes yes
Onboard test auto inventory (determines volume in container) Measures number of tests remaining/Short sample detection/Clot detection Hemolysis/Turbidity detection-quantitation Sample volume can be reduced Increased to rerun out-of-linear-range high/low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse Automatic shutdown programmable/Startup programmable	yes yes/yes/yes yes/yes yes yes/yes yes yes/yes 1 day/30 days/14 days/14–20 days yes/yes	yes yes/yes/yes yes/yes yes yes yes yes/yes 1 day/30 days/14 days/14 to 20 days yes/yes	yes yes/yes/yes yes/yes yes yes yes yes/yes 1 day/30 days/14 days/14 to 20 days yes/yes
Stat time to completion of all analytes and throughput per hour for: • Sodium, potassium, chloride, TC02 • Sodium, potassium, chloride, TC02, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP Typical time delay from ordering stat test to aspiration of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot numbers per analyte System can automatically transfer QC results to LIS	4–9 minutes, 267 specimens 4–9 minutes, 267 specimens 9 minutes, 267 specimens 1 minute per CLIA and laboratory's decision yes/yes yes	including TC02, TAT <9 minutes*, 200 specimens including TC02, TAT <9 minutes, 80 specimens <9 minutes, 67 specimens <2 minutes per CLIA and laboratory's decision/yes yes/yes yes	including TC02, TAT <9 minutes, 200 specimens including TC02, TAT <9 minutes, 160 specimens 9 minutes, 133 specimens 1 minute per CLIA and laboratory's decision/yes yes/yes yes
Data-management capability/Instrument vendor supplies LIS interface Interfaces to what LISs up and running in active user sites Bidirectional interface capability Uses LOINC to transmit orders and results across interface How labs get LOINC codes for reagent kits	onboard/no all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC yes, broadcast download and host query no —	onboard/no (optional) all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC yes (broadcast download and host query) no —	onboard/no (optional) all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC yes (broadcast download and host query) no —
Interface available (or will be) to automated specimen-handling system Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component On-site time of service engineer Mean time between failures/Mean time to repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maintenance training demo module Training provided with instrument purchase	yes yes/yes/yes <24 hours <4 calls per year/<24 hours daily: 5 minutes; weekly: 42 minutes; monthly: 15 minutes yes (includes audit trail)/yes 3–5 days on site, 5 days at company offices	yes yes/yes/yes <24 hours average two calls per year/<24 hours daily: 5 minutes; weekly: 12 minutes; monthly: 45 minutes yes (includes audit trail of who replaced parts)/yes 3–5 days on site, 5 days at company offices	yes yes/yes/yes <24 hours average two calls per year/<24 hours daily: 4 minutes; weekly: 27 minutes; monthly: 45 minutes yes (includes audit trail of who replaced parts)/yes 3–5 days on site, 5 days at company offices
Distinguishing product features (supplied by company)	speed: throughput of up to 3,800 tests per hour (with dual ISE); standardization with the AU family of chemistry systems (AU480 and AU680)—same reagent inventory, operating software, test results, and reference ranges for improved patient management and streamlined operation; reduced sampling volume; enhanced options for reflex, repeat, pre-dilution, autocalibration, auto QC, and multi-lot advanced calibration	standardization with its family of chemistry/immuno systems—the AU680, AU2700, and AU5400; test menu of 130 methods provides standardized results for improved patient management and streamlined operation	standardization with its family of chemistry/immuno systems—the AU480, AU2700, and AU5400; test menu of 130 methods; fully automated HbA1c option available; reduced sampling volume; laboratory-definable enhanced options for reflex, repeat, predilution, autocalibration, auto QC, and multi-lot advanced calibration

Note: a dash in lieu of an answer means company did not answer question or question is not applicable

\*TC02 is photometric assay

## Chemistry analyzers for mid- and high-volume laboratories

Part 5 of 14	<b>HIGH</b>	<b>HIGH</b>	<b>HIGH</b>
See <a href="http://captodayonline.com/productguides">captodayonline.com/productguides</a> for an interactive version of guide	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Blvd., Brea, CA 92821 714-961-6698 www.beckmancoulter.com	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Blvd., Brea, CA 92821 714-961-6698 www.beckmancoulter.com	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Blvd., Brea, CA 92821 714-961-6698 www.beckmancoulter.com
<b>Name of instrument/First year sold in U.S.</b> <b>List price/Total No. sold in 2011</b> <b>Number of units in clinical use in U.S./Outside U.S.</b> <b>Where designed/Manufactured/Where reagents manufactured</b> <b>Operational type/Reagent type</b>	AU2700/2000 \$320,000/22 >145/>810 Japan/Japan/U.S. and Ireland random access, discrete, continuous random access/ open reagent system	AU5421 with dual ISE/2001 \$465,000/— 225/450 Japan/Japan/U.S. and Ireland random access, discrete, continuous random access/ open reagent system	AU5431 with dual ISE/2001 \$575,000/— 225/450 Japan/Japan/U.S. and Ireland random access, discrete, continuous random access/ open reagent system
<b>Sample handling system/Model type</b> <b>Dimensions in inches (H × W × D)/Footprint in square feet</b>	rack and stat carousel/floor standing 50 × 79 × 45/24.7	rack/floor standing 50 × 148 × 45/46.25	rack/floor standing 50 × 200 × 45/62.5
<b>Number of tests for which analyzer has FDA-cleared applications</b> <b>Tests released for clinical use in last 12 months</b>	125 —	125 —	130 —
<b>Tests cleared but not released for clinical use</b> <b>Tests not available in U.S. but submitted for 510(k) clearance</b>	— 0	— —	— —
<b>Tests not available in U.S. but available in other countries</b>	—	—	—
<b>Research-use-only assays</b> <b>Tests in development</b>	— —	— —	— —
<b>Methodologies supported/Immunoassay methodologies</b>	photometry, potentiometry, calculated tests/ homogeneous	photometry, potentiometry, calculated tests/ homogeneous	photometry, potentiometry, calculated tests/ homogeneous
<b>Number of direct ion-selective electrode channels</b> <b>Number of different measured assays onboard simultaneously</b> <b>Number of different assays programmed and calibrated at once</b> <b>Number of user-definable (open) channels/Number active simultaneously</b> <b>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</b>	3 up to 51 99 95/48 48/100–4,000	3 99 99 95/95 48 × 2/100–4,000	3 up to 99 99 95/95 48 × 3/100–4,000
<b>Shortest/Median onboard reagent stability/Refrigerated onboard</b> <b>Multiple reagent configurations supported</b> <b>Reagent container placed directly on system for use</b> <b>Instrument has same capabilities when third-party reagents used</b> <b>Walkaway capacity in minutes/Specimens/Tests or assays</b> <b>Uses disposable cuvettes/Maximum number stored</b> <b>Uses washable cuvettes/Replacement frequency</b> <b>Minimum sample volume aspirated precisely at one time</b> <b>Supplied with UPS (backup power)/Requires floor drain</b> <b>Requires dedicated water system/Water consumption per hour</b> <b>Noise generated in decibels</b> <b>Dedicated pediatric sample cup/Dead volume</b> <b>Primary tube sampling/Pierces caps on primary tubes</b> <b>Sample bar-code reading capability/Autodiscrimination</b>	120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 322/varies no/— yes/permanent 1.6 µL no (optional)/yes yes/55 L peak consumption <65 no/— yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 300/varies no/— yes/permanent 1.6 µL no (optional)/yes yes/110 L peak consumption <65 no/— yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved)/yes	120 hours/30 days/yes (4°–12°C) yes yes yes varies/up to 300/varies no/— yes/permanent 1.6 µL no (optional)/yes yes/165 L average peak consumption — no/— yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes
<b>Reagent bar-code reading capability</b> <b>Bar code placement per CLSI standard Auto2A</b>	yes yes	yes yes	yes yes
<b>Onboard test auto inventory (determines volume in container)</b> <b>Measures number of tests remaining/Short sample detection/Clot detection</b> <b>Hemolysis/Turbidity detection-quantitation</b> <b>Sample volume can be reduced</b> <b>Increased to rerun out-of-linear-range high/low results</b> <b>Autocalibration or autocalibration alert</b> <b>Calibrants stored onboard/Multipoint calibration supported</b> <b>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</b> <b>Automatic shutdown programmable/Startup programmable</b>	yes yes/yes/yes yes/yes yes yes yes yes/yes 1 day/30 days/14 days/14 to 20 days yes/yes	yes yes/yes/yes yes/yes yes yes yes yes/yes 1 day/30 days/14 days/14 to 20 days yes/yes	yes yes/yes/yes yes/yes yes yes yes yes/yes 1 day/30 days/14 days/14 to 20 days yes/yes
<b>Stat time to completion of all analytes and throughput per hour for:</b> • Sodium, potassium, chloride, TCO2 • Sodium, potassium, chloride, TCO2, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP	includ. photometric assays, TAT 4–9 min., 267 specimens includ. photometric assays, TAT 4–9 min., 267 specimens 9 minutes, 267 specimens	—, maximum 600 specimens —, maximum 600 specimens —, maximum 533 specimens	—, maximum 600 specimens —, maximum 600 specimens —, maximum 800 specimens
<b>Typical time delay from ordering stat test to aspiration of sample</b> <b>How often QC required/Onboard SW capability to review QC</b> <b>Onboard real-time QC/Support multiple QC lot numbers per analyte</b> <b>System can automatically transfer QC results to LIS</b>	1 minute per CLIA and laboratory's decision/yes yes/yes yes	— per CLIA and laboratory's decision/yes yes/yes yes	— per CLIA and laboratory's decision/yes yes/yes yes
<b>Data-management capability/Instrument vendor supplies LIS interface</b>	onboard/no (optional)	onboard/no (optional)	onboard/no (optional)
<b>Interfaces to what LISs up and running in active user sites</b> <b>Bidirectional interface capability</b> <b>Uses LOINC to transmit orders and results across interface</b> <b>How labs get LOINC codes for reagent kits</b>	all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC yes (broadcast download and host query) no —	all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC yes (broadcast download and host query) no —	all common interfaces, including Cerner, Antrim, CCA, Chemware, Dawning Technology, ADAC, Dynamic Healthcare, Antek, Siemens, McKesson (Data Innovations), CPSI, Meditech, Misys, Citation, SCC yes (broadcast download and host query) no —
<b>Interface available (or will be) to automated specimen-handling system</b>	yes	yes	yes
<b>Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component</b> <b>On-site time of service engineer</b> <b>Mean time between failures/Mean time to repair failures</b> <b>Average time to complete maintenance by lab personnel</b>	yes/yes/yes <24 hours <4 calls per year/<24 hours daily: 5 minutes; weekly: 42 minutes; monthly: 15 minutes	yes/yes/yes <24 hours <9 calls per year/<24 hours daily: 30 minutes; weekly: 81 minutes; monthly: 40 minutes	yes/yes/yes <24 hours <9 calls per year/<24 hours daily: 30 minutes; weekly: 81 minutes; monthly: 40 minutes
<b>Onboard maintenance records/Maintenance training demo module</b> <b>Training provided with instrument purchase</b>	yes (includes audit trail of who replaced parts)/yes 3–5 days on site, 5 days at company offices	yes (includes audit trail of who replaced parts)/yes 5 days at company offices	yes (includes audit trail of who replaced parts)/yes 5 days at company offices
<b>Distinguishing product features (supplied by company)</b>	standardization with its family of chemistry/immuno systems—the AU480, AU2700, and AU5400; test menu of 130 methods provides standardized results for improved patient management and streamlined operation	standardization with its family of chemistry/immuno systems—the AU480, AU680, AU2700, and AU5400; test menu of 130 methods provides standardized results for improved patient management and streamlined operation	standardization with its family of chemistry/immuno systems—the AU480, AU680, AU2700, and AU5400; test menu of 130 methods provides standardized results for improved patient management and streamlined operation

Note: a dash in lieu of an answer means company did not answer question or question is not applicable

## Chemistry analyzers for mid- and high-volume laboratories

Part 6 of 14	<b>MID</b>	<b>HIGH</b>	<b>MID</b>
See <a href="http://captodayonline.com/productguides">captodayonline.com/productguides</a> for an interactive version of guide	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Blvd., Brea, CA 92821 714-961-6698 www.beckmancoulter.com	<b>Beckman Coulter Inc.</b> Burch Ekener bekener@beckman.com 250 S. Kraemer Blvd., Brea, CA 92821 714-961-6698 www.beckmancoulter.com	<b>Beckman Coulter Inc.</b> Angela Suh asuh@beckman.com 250 S. Kraemer Blvd., Brea, CA 92821 714-961-3140 www.beckmancoulter.com
<b>Name of instrument/First year sold in U.S.</b> <b>List price/Total No. sold in 2011</b> <b>Number of units in clinical use in U.S./Outside U.S.</b> <b>Where designed/Manufactured/Where reagents manufactured</b> <b>Operational type/Reagent type</b> <b>Sample handling system/Model type</b> <b>Dimensions in inches (H × W × D)/Footprint in square feet</b>	UniCel DxC 600/2004 \$261,000/— >1,800 />2,900 U.S./U.S./U.S. and Ireland continuous random access/open reagent system racks, centrifugable/floor standing 62 × 62 × 41/17.7	UniCel DxC 800/2005 \$340,000/not available >700/>2,000 U.S./U.S./U.S. and Ireland continuous random access/open reagent system racks, centrifugable/floor standing 62 × 70 × 41/19.9	UniCel DxC 600i/2006 \$400,000/— >445/>150 U.S./U.S./U.S., Ireland, France continuous random access/open reagent system racks, closed-tube/floor standing 62 × 128 × 48/42.7
<b>Number of tests for which analyzer has FDA-cleared applications</b> <b>Tests released for clinical use in last 12 months</b>  <b>Tests cleared but not released for clinical use</b> <b>Tests not available in U.S. but submitted for 510(k) clearance</b> <b>Tests not available in U.S. but available in other countries</b>	>100 —  — — —	>100 —  — — —	>150 —  — HAV Ab, HAV IgM, HBcAb, HBc IgM, HBsAb, HBsAg, HBsAg confirmatory, CMV IgG, CMV IgM, rubella IgM (BVID assays can only be run on the Access 2 portion of DxC 600i in standalone mode) IL-6, PAPP-A PIGF, sVEGF R1, vitamin D
<b>Research-use-only assays</b> <b>Tests in development</b>	— HbA1c (next-generation)	— HbA1c (next-generation)	— HbA1c (next-generation)
<b>Methodologies supported/Immunoassay methodologies</b>  <b>Number of direct ion-selective electrode channels</b> <b>Number of different measured assays onboard simultaneously</b> <b>Number of different assays programmed and calibrated at once</b> <b>Number of user-definable (open) channels/Number active simultaneously</b> <b>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</b> <b>Shortest/Median onboard reagent stability/Refrigerated onboard</b> <b>Multiple reagent configurations supported</b> <b>Reagent container placed directly on system for use</b> <b>Instrument has same capabilities when third-party reagents used</b> <b>Walkaway capacity in minutes/Specimens/Tests or assays</b> <b>Uses disposable cuvettes/Maximum number stored</b> <b>Uses washable cuvettes/Replacement frequency</b> <b>Minimum sample volume aspirated precisely at one time</b> <b>Supplied with UPS (backup power)/Requires floor drain</b> <b>Requires dedicated water system/Water consumption per hour</b> <b>Noise generated in decibels</b> <b>Dedicated pediatric sample cup/Dead volume</b> <b>Primary tube sampling/Pierces caps on primary tubes</b> <b>Sample bar-code reading capability/Autodiscrimination</b>	photometry, potentiometry, near-infrared bidentate turbidimetric/particle enhanced turbidimetric, enzyme immunoassay, near-infrared particle immunoassay  5 65 100 100/65 65/about 3,500 modular; about 600 cartridges  168 hours/30 days/yes (2°–8°C) yes yes no 83/132/5,280 — yes/2-year warranty, semi-permanent 3 µL optional/no yes/16 L 60 yes/40 µL yes/yes yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes yes yes	photometry, potentiometry (ISE), near-infrared bidentate turbidimetric, direct turbidimetric, particle enhanced turbidimetric/enzyme immunoassay, near- infrared particle immunoassay  5 70 100 100/70 70/about 3,500 (modular); 600 cartridges  168 hours/30 days/yes (2°–8°C) yes yes no 83/132/5,280 no yes/2-year warranty, semi-permanent 3 µL optional/no yes/16 L 60 yes/40 µL (samples directly from bullet) yes/yes yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes yes yes	photometry, potentiometry (ISE), turbidimetric, enzyme immunoassay/chemiluminescence  5 89 >150 100/65 89/about 300 cartridges (chemistry), 50 per pack (immunoassay) 168 hours/28 days/yes (2°–10°C) yes yes no 180/96/5,280 yes/294 (immunoassay) yes/2-year warranty (chemistry) 3 µL optional/yes yes/16 L — yes/— yes/yes yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes yes yes
<b>Onboard test auto inventory (determines volume in container)</b> <b>Measures number of tests remaining/Short sample detection/Clot detection</b> <b>Hemolysis/Turbidity detection-quantitation</b> <b>Sample volume can be reduced</b> <b>Increased to rerun out-of-linear-range high/low results</b> <b>Autocalibration or autocalibration alert</b> <b>Calibrants stored onboard/Multipoint calibration supported</b> <b>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</b> <b>Automatic shutdown programmable/Startup programmable</b>	yes yes/yes/yes yes/yes yes yes yes no/yes 1 day/up to 90 days/up to 60 days/14 days none required	yes yes/yes/yes yes/yes yes yes yes no/yes 1 day/up to 90 days/up to 60 days/14 days none required	yes yes/yes/yes yes/yes yes no no no/yes 1 day/90 days/up to 60 days/14 days none required
<b>Stat time to completion of all analytes and throughput per hour for:</b> • Sodium, potassium, chloride, TCO2 • Sodium, potassium, chloride, TCO2, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP <b>Typical time delay from ordering stat test to aspiration of sample</b> <b>How often QC required/Onboard SW capability to review QC</b> <b>Onboard real-time QC/Support multiple QC lot numbers per analyte</b> <b>System can automatically transfer QC results to LIS</b>	6:15 minutes from standby, 96 specimens 6:15 minutes from standby, 96 specimens 13:07 minutes from standby, 57 specimens 16 seconds 24 hours/yes yes/yes yes	2:23 minutes from standby, 91 specimens 2:22 minutes from standby, 91 specimens 12:32 minutes from standby, 76 specimens 16 seconds 24 hours/yes yes/yes yes	<1 minute, 90 specimens <1 minute, 90 specimens 1.1 minute, — 2:16 24 hours/— yes/yes yes/yes
<b>Data-management capability/Instrument vendor supplies LIS interface</b>  <b>Interfaces to what LISs up and running in active user sites</b>  <b>Bidirectional interface capability</b> <b>Uses LOINC to transmit orders and results across interface</b> <b>How labs get LOINC codes for reagent kits</b>	onboard and optional add-on (SW manufacturer: Beckman Coulter)/yes (additional cost) Cerner, Misys, Meditech, Citation, MedLab, CHC, Siemens, McKesson, Labquest, CCA, VA-Mumps yes (broadcast download and host query) yes via e-mail	onboard and optional add-on (Beckman Coulter)/yes (additional cost) Cerner, Misys, Meditech, Citation, Medlab, CHC, Siemens, McKesson, Labquest, CCA, VA-Mumps yes (broadcast download and host query) yes via e-mail	onboard and optional add-on (SW manufacturer: Beckman Coulter)/— Cerner, Misys, Meditech, Citation, MedLab, CHC, Siemens, McKesson, Labquest, CCA, VA-Mumps yes (broadcast download and host query) yes via e-mail
<b>Interface available (or will be) to automated specimen-handling system</b>	yes, Beckman Coulter automation	yes, Beckman Coulter automation	no
<b>Modem servicing available/System can diagnose own malfunctions/            System can determine malfunctioning component</b> <b>On-site time of service engineer</b> <b>Mean time between failures/Mean time to repair failures</b> <b>Average time to complete maintenance by lab personnel</b>	yes/yes/yes  metro: same day, rural: same or next day — daily: none; weekly: 7 minutes (tech time); monthly: 11 minutes (tech time)	yes/yes/yes  metro: same day; rural: same or next day — weekly: 10 minutes (tech time); monthly: 18 minutes (tech time)	yes/yes/yes  metro: same day; rural: same or next day — daily: <15 minutes, weekly: 36 minutes; monthly: 11 minutes
<b>Onboard maintenance records/Maintenance training demo module</b> <b>Training provided with instrument purchase</b>	yes (includes audit trail of who replaced parts)/yes 5 days at company offices	yes (includes audit trail of who replaced parts)/yes 5 days at company offices	yes (includes audit trail of who replaced parts)/no 10 days at company offices
<b>Distinguishing product features (supplied by company)</b>	closed-tube sampling; serum indices/polychromatic correction; clot detection and correction; centrifugable racks, no-wait autoloader; calibration data provided on disk; Peltier ring with semi-permanent glass cuvettes; pulsed Xenon lamp; intuitive operator software; Remisol Advance Data Manager: stat notification, review by exception, reflex testing, add-on test notification	closed-tube sampling; serum indices/polychromatic correction; clot detection and correction; centrifugable racks; no-wait autoloader; calibration data provided on disk; Peltier ring with semi-permanent glass cuvettes; pulsed Xenon lamp; intuitive operator software; stat turnaround time; Remisol Advance Data Manager: stat notification, review by exception, reflex testing, add-on test notification	parallel processing of immunoassay and chemistry tests on a single system; ClozCap technology (closed-tube aliquotting and sampling) eliminates manual processes; chemistry and immunoassay reagent packs identical across UniCel systems; immunoassay: high-throughput analyzer; uses chemiluminescent assay technology and reagent packs for consistent results; loads consumables on the fly; chemistry: closed-tube sampling; serum indi- ces/polychromatic correction; clot detection and correc- tion; centrifugable racks; no-wait autoloader; calibration data provided on disk; Peltier ring with semi-permanent glass cuvettes; pulsed Xenon lamp; intuitive operator software; fast stat turnaround time

Note: a dash in lieu of an answer means company did not answer question or question is not applicable

## Chemistry analyzers for mid- and high-volume laboratories

Part 7 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>HIGH</b>	<b>HIGH</b>	<b>HIGH</b>
	<b>Beckman Coulter, Inc.</b>	<b>Beckman Coulter, Inc.</b>	<b>Beckman Coulter, Inc.</b>
	Angela Suh <a href="mailto:asuh@beckman.com">asuh@beckman.com</a> 250 S. Kraemer Blvd., Brea, CA 92821 714-961-3140 <a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a>	Angela Suh <a href="mailto:asuh@beckman.com">asuh@beckman.com</a> 250 S. Kraemer Blvd., Brea, CA 92821 714-961-3140 <a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a>	Angela Suh <a href="mailto:asuh@beckman.com">asuh@beckman.com</a> 250 S. Kraemer Blvd., Brea, CA 92821 714-961-3140 <a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a>
Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	UniCel DxC 660i Synchron Access Clinical System/2009 \$575,000/— 100/>150 U.S./U.S./U.S., France, Ireland batch, random access, continuous random access/ immunoassay: self-contained single-use cartridges, packages, slides; chemistry: open reagent system rack closed-tube/floor standing	UniCel DxC 680i Synchron Access Clinical System/2009 \$610,000/— >350/>500 U.S./U.S./U.S., France, Ireland batch, random access, continuous random access/ immunoassay: self-contained single-use cartridges, packages, slides; chemistry: open reagent system rack closed-tube/floor standing	UniCel DxC 860i Synchron Access Clinical System/2009 \$615,000/— >6/>20 U.S./U.S./U.S., France, Ireland batch, random access, continuous random access/ immunoassay: self-contained single-use cartridges, packages, slides; chemistry: open reagent system rack closed-tube/floor standing
Sample handling system/Model type Dimensions in inches (H × W × D)/Footprint in square feet	rack closed-tube/floor standing 68 × 147 × 48/49	rack closed-tube/floor standing 68 × 153 × 48/51	rack closed-tube/floor standing 68 × 155 × 48/51.7
Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months Tests cleared but not released for clinical use Tests not available in U.S. but submitted for 510(k) clearance Tests not available in U.S. but available in other countries	>150 — — — HAV Ab, HAV IgM, HBcAb, HBe IgM, HBsAb, HBsAg, HBsAg confirmatory, CMV IgG, CMV IgM, rubella IgM	>150 — — — HAV Ab, HAV IgM, HBcAb, HBe IgM, HBsAb, HBsAg, HBsAg confirmatory, CMV IgG, CMV IgM, rubella IgM	>150 — — — HAV Ab, HAV IgM, HBcAb, HBe IgM, HBsAb, HBsAg, HBsAg confirmatory, CMV IgG, CMV IgM, rubella IgM
Research-use-only assays Tests in development	IL-6, PAPP-A PIGF, sVEGF R1, vitamin D	IL-6, PAPP-A PIGF, sVEGF R1, vitamin D	IL-6, PAPP-A PIGF, sVEGF R1, vitamin D
Methodologies supported/Immunoassay methodologies	photometry, potentiometry (ISE), turbidimetric/particle enhanced, turbidimetric, enzyme immunoassay, near- infrared particle immunoassay, chemiluminescence, magnetic particle	photometry, potentiometry (ISE), turbidimetric/particle enhanced, turbidimetric, enzyme immunoassay, near- infrared particle immunoassay, chemiluminescence, magnetic particle	photometry, potentiometry (ISE), turbidimetric/particle enhanced, turbidimetric, enzyme immunoassay, near- infrared particle immunoassay, chemiluminescence, magnetic particle
Number of direct ion-selective electrode channels Number of different measured assays onboard simultaneously Number of different assays programmed and calibrated at once Number of user-definable (open) channels/Number active simultaneously Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when third-party reagents used Walkaway capacity in minutes/Specimens/Tests or assays Uses disposable cuvettes/Maximum number stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	5 115 115 100/100 115/immunoassay: 100 tests/kit; general chemistry: 300 tests/container 28 days/yes (2°–10°C) yes yes yes assay mix dependent/—/assay-dependent no/125 yes/— 3 µL yes/yes yes/up to 16 L 64 yes/20 yes/yes yes (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes	5 115 115 100/100 115/immunoassay: 100 tests/kit; general chemistry: 300 tests/container 28 days/yes (2°–10°C) yes yes yes assay mix dependent/—/assay-dependent no/125 yes/— 3 µL yes/yes yes/up to 16 L 64 yes/20 yes/yes yes (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes	5 120 120 100/100 120/immunoassay: 100 tests/kit; general chemistry: 300 tests/container 28 days/yes (2°–10°C) yes yes yes assay mix dependent/—/assay-dependent no/125 yes/— 3 µL yes/yes yes/up to 16 L 64 yes/20 yes/yes yes (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes
Reagent bar-code reading capability Bar code placement per CLSI standard Auto2A	yes yes	yes yes	yes yes
Onboard test auto inventory (determines volume in container) Measures number of tests remaining/Short sample detection/Clot detection Hemolysis/Turbidity detection-quantitation Sample volume can be reduced Increased to rerun out-of-linear-range high/low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse Automatic shutdown programmable/Startup programmable	yes yes/yes/yes yes/yes yes yes — no/yes —/—/assay-dependent/assay-dependent no/no	yes yes/yes/yes yes/yes yes yes — no/yes —/—/assay-dependent/assay-dependent no/no	yes yes/yes/yes yes/yes yes yes — no/yes —/—/assay-dependent/assay-dependent no/no
Stat time to completion of all analytes and throughput per hour for: • Sodium, potassium, chloride, TC02 • Sodium, potassium, chloride, TC02, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP	<1 minute, 90 specimens <1 minute, 90 specimens 1.1 minute, —	<1 minute, 90 specimens <1 minute, 90 specimens 1.1 minute, —	<1 minute, 90 specimens <1 minute, 90 specimens 1.1 minute, —
Typical time delay from ordering stat test to aspiration of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot numbers per analyte System can automatically transfer QC results to LIS	— 24 hours/yes yes/yes yes	— 24 hours/yes yes/yes yes	— 24 hours/yes yes/yes yes
Data-management capability/Instrument vendor supplies LIS interface	onboard and optional add-on (sw manufacturer: Beckman Coulter/Normand)/yes (additional cost)	onboard and optional add-on (sw manufacturer: Beckman Coulter/Normand)/yes (additional cost)	onboard and optional add-on (sw manufacturer: Beckman Coulter/Normand)/yes (additional cost)
Interfaces to what LISs up and running in active user sites Bidirectional interface capability Uses LOINC to transmit orders and results across interface How labs get LOINC codes for reagent kits	most commercially available LISs yes (broadcast download and host query) yes via e-mail	most commercially available LISs yes (broadcast download and host query) yes via e-mail	most commercially available LISs yes (broadcast download and host query) yes via e-mail
Interface available (or will be) to automated specimen-handling system	yes	yes	yes
Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component On-site time of service engineer Mean time between failures/Mean time to repair failures Average time to complete maintenance by lab personnel	yes/yes/yes metro: same day; rural: same or next day — daily: <10 minutes; weekly: <10 minutes; monthly: <18 minutes	yes/yes/yes metro: same day; rural: same or next day — daily: <10 minutes; weekly: <10 minutes; monthly: <18 minutes	yes/yes/yes metro: same day; rural: same or next day — daily: <10 minutes; weekly: <10 minutes; monthly: <18 minutes
Onboard maintenance records/Maintenance training demo module Training provided with instrument purchase	yes, includes audit trail/yes 5 days at company offices	yes, includes audit trail/yes 5 days at company offices	yes, includes audit trail/yes 5 days at company offices
Distinguishing product features (supplied by company)	parallel processing of immunoassay and chemistry tests on a single system; ClozCap technology (closed-tube aliquotting and sampling) eliminates manual processes; chemistry and immunoassay reagent packs identical across UniCel systems; immunoassay: high-throughput analyzer; uses chemiluminescent assay technology and reagent packs for consistent results; loads consumables on the fly; chemistry: closed-tube sampling; serum indices/polychromatic correction; clot detection and correction; centrifugable racks; no-wait autoloader; calibration data provided on disk; Peltier ring with semi- permanent glass cuvettes; pulsed Xenon lamp; intuitive operator software; fast stat turnaround time; Remisol Advance Data Manager: stat notification, review by exception, reflex testing, add-on test notification	parallel processing of immunoassay and chemistry tests on a single system; ClozCap technology (closed-tube aliquotting and sampling) eliminates manual processes; chemistry and immunoassay reagent packs identical across UniCel systems; immunoassay: high-throughput analyzer; uses chemiluminescent assay technology and reagent packs for consistent results; loads consumables on the fly; chemistry: closed-tube sampling; serum indices/polychromatic correction; clot detection and correction; centrifugable racks; no-wait autoloader; calibration data provided on disk; Peltier ring with semi- permanent glass cuvettes; pulsed Xenon lamp; intuitive operator software; fast stat turnaround time; Remisol Advance Data Manager: stat notification, review by exception, reflex testing, add-on test notification	parallel processing of immunoassay and chemistry tests on a single system; ClozCap technology (closed-tube aliquotting and sampling) eliminates manual processes; chemistry and immunoassay reagent packs identical across UniCel systems; immunoassay: high-throughput analyzer; uses chemiluminescent assay technology and reagent packs for consistent results; loads consumables on the fly; chemistry: closed-tube sampling; serum indices/polychromatic correction; clot detection and correction; centrifugable racks; no-wait autoloader; calibration data provided on disk; Peltier ring with semi- permanent glass cuvettes

*Note: a dash in lieu of an answer means company did not answer question or question is not applicable*

## Chemistry analyzers for mid- and high-volume laboratories

Part 8 of 14	<b>HIGH</b>	<b>MID</b>
<p>See <a href="http://captodayonline.com/productguides">captodayonline.com/productguides</a> for an interactive version of guide</p>	<p><b>Beckman Coulter Inc.</b>            Angela Suh <a href="mailto:asuh@beckman.com">asuh@beckman.com</a>            250 S. Kraemer Blvd., Brea, CA 92821            714-961-3140 <a href="http://www.beckmancoulter.com">www.beckmancoulter.com</a></p>	<p><b>The Binding Site</b>            Maureen Zettmeisl <a href="mailto:maureen.zettmeisl@thebindingsite.com">maureen.zettmeisl@thebindingsite.com</a>            5889 Oberlin Drive, Suite 101, San Diego, CA 92121            800-633-4484 ext. 333 <a href="http://www.thebindingsite.com">www.thebindingsite.com</a></p>
<p>Name of instrument/First year sold in U.S.            List price/Total No. sold in 2011            Number of units in clinical use in U.S./Outside U.S.            Where designed/Manufactured/Where reagents manufactured            Operational type/Reagent type</p>	<p>UniCel DxC 880i Synchron Access Clinical System/2008            \$650,000/—            &gt;24/&gt;100            U.S./U.S./U.S., Ireland and France            continuous random access/open reagent system for chemistry; self-contained single use cartridges for immunoassay            rack closed tube/floor standing</p>	<p>SPA PLUS (Specialist Protein Analyzer)/2007            —            —            Japan/Japan/United Kingdom            batch, random access/self-contained multi-use cartridges, packages, slides</p>
<p>Sample handling system/Model type</p>		<p>2 sample carousels each hold 45 samples: 30 primary tubes and 15 non-bar-coded sample tubes, cups/benchtop            20.5 × 31.5 × 25.2/14</p>
<p>Dimensions in inches (H × W × D)/Footprint in square feet</p>	<p>68 × 161 × 48/53.7</p>	
<p>Number of tests for which analyzer has FDA-cleared applications</p>	<p>&gt;150</p>	<p>free kappa light chain, free lambda light chain, IgG, IgA, IgM, IgD, IgG1, IgG2, IgG3, IgG4, IgA1, IgA2, albumin, beta-2-microglobulin, cystatin C, C3c, C4, haptoglobin, prealbumin</p>
<p>Tests released for clinical use in last 12 months            Tests cleared but not released for clinical use            Tests not available in U.S. but submitted for 510(k) clearance            Tests not available in U.S. but available in other countries</p>	<p>—            —            —            HAV Ab, HAV IgM, HbcAb, Hbc IgM, HBsAb, HBsAg, HBsAg confirmatory, CMV IgG, CMV IgM, rubella IgM</p>	<p>—            —            —            CH50, Hevylite IgG kappa and lambda, Hevylite IgA kappa and lambda, Hevylite IgM kappa and lambda, albumin CSF, IgG CSF, IgA CSF, IgM CSF, transferrin</p>
<p>Research-use-only assays            Tests in development</p>	<p>IL-6, PAPP-A            PIGF, sVEGF R1, vitamin D</p>	<p>tetanus toxoid, T. tox plasma screen only (RUO)            alpha-1-antitrypsin, alpha-1-acid-glycoprotein, C1 inactivator, ceruloplasmin, CRP, microalbumin</p>
<p>Methodologies supported/Immunoassay methodologies</p>	<p>photometry, potentiometry (ISE), turbidimetric/enzyme immunoassay, near-infrared particle immunoassay, chemiluminescence, magnetic particle/chemiluminescence; magnetic particle</p>	<p>—/turbidimetry</p>
<p>Number of direct ion-selective electrode channels            Number of different measured assays onboard simultaneously            Number of different assays programmed and calibrated at once            Number of user-definable (open) channels/Number active simultaneously            Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set            Shortest/Median onboard reagent stability/Refrigerated onboard            Multiple reagent configurations supported            Reagent container placed directly on system for use            Instrument has same capabilities when third-party reagents used            Walkaway capacity in minutes/Specimens/Tests or assays            Uses disposable cuvettes/Maximum number stored            Uses washable cuvettes/Replacement frequency</p>	<p>5            120            120            100/100            120/100 tests per kit (immunoassay); 300 tests per container (general chemistry)            316 hours/28 days/yes (2°–10°C)            yes            yes            no            assay mix dependent/112/assay-dependent            no/—            yes/2-year warranty, semi-permanent</p>	<p>—            24            —            —            24/100            672 hours/30 days/yes            yes            yes            no            ~60/45/6            no/60            yes/checks OD and when it reaches threshold OD (0.33) cuvettes should be changed</p>
<p>Minimum sample volume aspirated precisely at one time            Supplied with UPS (backup power)/Requires floor drain            Requires dedicated water system/Water consumption per hour            Noise generated in decibels            Dedicated pediatric sample cup/Dead volume            Primary tube sampling/Pierces caps on primary tubes            Sample bar-code reading capability/Autodiscrimination</p>	<p>3 µL            yes/yes            yes/up to 16 L            64            yes/20 µL (chemistry)            yes/yes            yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes</p>	<p>3 µL            yes/no            no/3.5 L            —            no/—            yes/no            yes, as sample is being aspirated, on sample transport, shortly before sample is aspirated (Codabar, codes 39 and 128)/—</p>
<p>Reagent bar-code reading capability            Bar code placement per CLSI standard Auto2A</p>	<p>yes            yes</p>	<p>yes            —</p>
<p>Onboard test auto inventory (determines volume in container)            Measures number of tests remaining/Short sample detection/Clot detection            Hemolysis/Turbidity detection-quantitation            Sample volume can be reduced            Increased to rerun out-of-linear-range high/low results            Autocalibration or autocalibration alert            Calibrants stored onboard/Multipoint calibration supported            Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse            Automatic shutdown programmable/Startup programmable</p>	<p>—            yes/yes/yes            yes/yes            yes            no            no            no/yes            24 hours/up to 90 days/up to 60 days/up to 90 days            no/no</p>	<p>no            yes/yes/no            no/no            yes            yes            yes            no/yes            —            no/no</p>
<p>Stat time to completion of all analytes and throughput per hour for:            • Sodium, potassium, chloride, TCO2            • Sodium, potassium, chloride, TCO2, glucose, urea, creatinine            • Albumin, direct and total bilirubin, AST, ALT, ALP            Typical time delay from ordering stat test to aspiration of sample            How often QC required/Onboard SW capability to review QC</p>	<p>&lt;1 minute, 90 specimens            &lt;1 minute, 90 specimens            &lt;1 minute, —            &lt;1 minute            24 hours/yes</p>	<p>—            —            —            —            —</p>
<p>Onboard real-time QC/Support multiple QC lot numbers per analyte            System can automatically transfer QC results to LIS</p>	<p>yes/yes            yes</p>	<p>yes/no            yes</p>
<p>Data-management capability/Instrument vendor supplies LIS interface</p>	<p>onboard and optional add-on (Beckman Coulter)/yes (additional cost)</p>	<p>yes, onboard (optional add-on)/no</p>
<p>Interfaces to what LISs up and running in active user sites</p>	<p>Cerner, Misys, Meditech, Citation, Medlab, CHC, Siemens, McKesson, Labquest, CCA, VA-Mumps</p>	<p>Cerner, Soft Computer Concepts, Cyberlab, Sunquest, Meditech, Data Innovations middleware, Creative Computing Applications Inc., Rubicon</p>
<p>Bidirectional interface capability            Uses LOINC to transmit orders and results across interface            How labs get LOINC codes for reagent kits</p>	<p>yes (broadcast download and host query)            yes            via e-mail</p>	<p>yes (broadcast download, host query)            no            —</p>
<p>Interface available (or will be) to automated specimen-handling system</p>	<p>yes (if cleaved, Dxl and DxC systems can interface with Beckman Coulter automation)</p>	<p>no</p>
<p>Modem servicing available/System can diagnose own malfunctions/            System can determine malfunctioning component            On-site time of service engineer            Mean time between failures/Mean time to repair failures</p>	<p>yes/yes/yes            metro: same day; rural: same or next day            —</p>	<p>no/no/no            24 hours            258 days with two scheduled preventive maintenance visits/4 hours on site</p>
<p>Average time to complete maintenance by lab personnel</p>	<p>daily: &lt;10 minutes; weekly: &lt;10 minutes;            monthly: &lt;18 minutes</p>	<p>daily: &lt;10 minutes; weekly: &lt;10 minutes;            monthly: &lt;15 minutes</p>
<p>Onboard maintenance records/Maintenance training demo module            Training provided with instrument purchase</p>	<p>yes (includes audit trail of who replaced parts/no contract-dependent)</p>	<p>no/no            5 days (includes installation)</p>
<p>Distinguishing product features (supplied by company)</p>	<p>parallel processing of immunoassay and chemistry tests on a single system; ClozCap technology (closed-tube aliquotting and -sampling) eliminates manual processes; chemistry and immunoassay reagent packs identical across UniCel systems; immunoassay: high-throughput analyzer; uses chemiluminescent assay technology and reagent packs for consistent results</p>	<p>prozone detection, autodilution; dual-compartment reaction cuvette, air-pressure mixing system and extensive washing processes, ideal for latex assays; low maintenance</p>
<p><i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i></p>		



## Chemistry analyzers for mid- and high-volume laboratories

Part 9 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>MID</b>	<b>MID</b>	<b>HIGH</b>
	<b>Carolina Liquid Chemistries Corp.</b> <b>Patti Shugart</b> contactsales@carolinachemistries.com 391 Technology Way, Winston-Salem, NC 27101 877-722-8910 www.carolinachemistries.com	<b>Carolina Liquid Chemistries Corp.</b> <b>Patti Shugart</b> contactsales@carolinachemistries.com 391 Technology Way, Winston-Salem, NC 27101 877-722-8910 www.carolinachemistries.com	<b>Carolina Liquid Chemistries Corp.</b> <b>Patti Shugart</b> contactsales@carolinachemistries.com 391 Technology Way, Winston-Salem, NC 27101 877-722-8910 www.carolinachemistries.com
Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	BioLis 24i/2008 \$75,000/50 300/4,000 Japan/Japan/U.S. batch, random access, discrete, continuous random access/open reagent system	CLC 480/— \$75,000/— —/— Japan/Japan/U.S. batch, random access, discrete, continuous random access/open reagent system	CLC 720/— \$110,000/— —/— China/China/U.S. batch, random access, discrete, continuous random access/open reagent system
Sample handling system/Model type	cup, bar-coded tubes, stat/benchtop	cup, primary, bar-coded tubes, stat/benchtop	carousel, all traditional sample tubes and cups/ floor-standing
Dimensions in inches (H × W × D)/Footprint in square feet	20 × 31 × 25/5	20 × 31 × 25/5	46.5 × 27.5 × 45/8.9
Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months Tests cleared but not released for clinical use Tests not available in U.S. but submitted for 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays Tests in development	100 direct (no-pretreat.) HbA1c & cystatin C, 1,5AG (GlycoMark) Lp-PLA2 — — — vitamin D, RPR syphilis	90 — — — — vitamin D, RPR vitamin D, RPR	80 — — — — vitamin D, syphilis vitamin D, syphilis
Methodologies supported/Immunoassay methodologies	photometry, potentiometry/—	photometry, potentiometry/—	photometry, potentiometry/—
Number of direct ion-selective electrode channels Number of different measured assays onboard simultaneously Number of different assays programmed and calibrated at once Number of user-definable (open) channels/Number active simultaneously Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when third-party reagents used Walkaway capacity in minutes/Specimens/Tests or assays Uses disposable cuvettes/Maximum number stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	3 39 39 39/39 39/300 (3 × 100) 7 days/14 days/yes yes yes yes 4 hours/40/39 no/— yes/6 months 3 µL no/no no/3.5 L — yes/30 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved)/—	3 39 39 39/39 39/300 7 days/14 days/yes yes yes yes 4 hours/40/39 no/— yes/~6 months 3 µL no/no no/3.5 L 40 yes/30 µL yes/no yes, on sample transport, shortly before sample is aspirated (codes 39 and 128)/—	4 77 77 77/77 77/250-300 7 days/14 days/yes (<10°C) yes yes yes —/60/77 no/— yes/~6 months 2 µL no/no yes/20 L <60 — yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes
Reagent bar-code reading capability Bar code placement per CLSI standard Auto2A	yes yes	yes yes	yes yes
Onboard test auto inventory (determines volume in container) Measures number of tests remaining/Short sample detection/Clot detection Hemolysis/Turbidity detection-quantitation Sample volume can be reduced Increased to rerun out-of-linear-range high/low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse Automatic shutdown programmable/Startup programmable	yes yes/yes/yes yes/yes yes no no yes/yes 24 hours/14 days/14 days/14 days yes/yes	yes yes/yes/yes yes/yes yes yes/no yes yes/yes 24 hours/14 days/14 days/7-14 days yes/yes	yes yes/yes/yes yes/yes yes yes/yes yes yes/yes daily/30 days/—/— yes/no
Stat time to completion of all analytes and throughput per hour for: • Sodium, potassium, chloride, TC02 • Sodium, potassium, chloride, TC02, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP Typical time delay from ordering stat test to aspiration of sample How often QC required/Onboard SW capability to review QC	12 minutes, 160 specimens 1 hour, 60 specimens 18 minutes, 240 specimens 5 minutes 2 levels per operational shift; shortest interval: 8 hours; longest: 24 hours/yes	12 minutes, 160 specimens 1 hour, 60 specimens 18 minutes, 240 specimens 5 minutes 2 levels per operational shift; shortest interval: 8 hours; longest: 24 hours/yes	— — — — once per shift; shortest interval: 8 hours/yes
Onboard real-time QC/Support multiple QC lot numbers per analyte System can automatically transfer QC results to LIS	yes/yes yes	yes/yes yes	yes/yes yes
Data-management capability/Instrument vendor supplies LIS interface	yes, onboard/yes (additional cost)	yes, onboard (optional add-on)/yes (additional cost)	yes, onboard/yes (additional cost)
Interfaces to what LISs up and running in active user sites Bidirectional interface capability Uses LOINC to transmit orders and results across interface How labs get LOINC codes for reagent kits	all common LISs yes (broadcast download, host query) — —	Lab Track, Orchard, Fletcher Flora, most common LIS yes (broadcast download and host query) yes tech representative will provide	all major LISs yes (broadcast download and host query) yes e-mail query
Interface available (or will be) to automated specimen-handling system	no	no	no
Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component On-site time of service engineer Mean time between failures/Mean time to repair failures Average time to complete maintenance by lab personnel	no/no/yes within 24 hours — weekly: 20 minutes; monthly: visual inspections, <5 minutes	yes/no/no within 24 hours — weekly: 30 minutes; monthly: visual inspection <5 minutes	yes/no/no within 24 hours — daily: 5 minutes; weekly: 10 minutes
Onboard maintenance records/Maintenance training demo module Training provided with instrument purchase	yes (includes audit trail of who replaced parts)/no 5 days on site	yes (includes audit trail of who replaced parts)yes 2-3 days on site, 2-4 days at company office	yes (includes audit trail of who replaced parts)yes 2-4 days on site, 2-4 days at company office
Distinguishing product features (supplied by company)	small size and large menu; 39 onboard chemistries; can run general and special chemistries from CMPs to D-dimer, cystatin C, insulin, and drugs of abuse, both qualitative and quantitative, and more than 80 other tests	large test menu; small size, quiet; no need for disposable reaction cuvettes	takes up little space; runs quietly on 110v; consumes very little water

*Note: a dash in lieu of an answer means company did not answer question or question is not applicable*

## Chemistry analyzers for mid- and high-volume laboratories

Part 10 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>HIGH</b>	<b>HIGH</b>	<b>MID</b>
	Ortho-Clinical Diagnostics Mark Steelman msteelma@its.jnj.com 1001 U.S. Route 202, Raritan, NJ 08869 585-453-3420 www.orthoclinical.com	Ortho-Clinical Diagnostics Mark Steelman msteelma@its.jnj.com 1001 U.S. Route 202, Raritan, NJ 08869 585-453-3420 www.orthoclinical.com	Ortho-Clinical Diagnostics Mark Steelman msteelma@its.jnj.com 1001 U.S. Route 202, Raritan, NJ 08869 585-453-3420 www.orthoclinical.com
Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	VITROS 4600 Chemistry System/2011 \$227,000/— — U.S./U.S./U.S. and United Kingdom batch, random access, discrete, continuous random access/self-contained multi-use cartridges, packages, slides	VITROS 5600 Integrated System/2008 \$410,000/— >900 worldwide U.S./U.S./U.S. and United Kingdom batch, random access, discrete, continuous random access/self-contained multi-use cartridges, packages, slides	VITROS 350/2005 \$110,000/— —/— U.S./U.S./U.S. batch, random access, discrete, continuous random access/self-contained single-use cartridges, packages, slides
Sample handling system/Model type Dimensions in inches (H × W × D)/Footprint in square feet	10-sample universal sample trays/floor-standing 52.5 × 92.2 × 33.4/21.4	universal sample tray/floor standing 68 × 110 × 34.9/26.7	rack/floor standing 47 × 45.5 × 28/8.8
Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months Tests cleared but not released for clinical use Tests not available in U.S. but submitted for 510(k) clearance Tests not available in U.S. but available in other countries	>75 — — — —	>110 iPTH — — HBeAg, aHBe, rub IgM, tox IgG, tox IgM, CMV IgG, CMV IgM	>40 — — — —
Research-use-only assays Tests in development	— —	— syphilis (ex-US), aHBE, HBeAg, total vitamin D	— —
Methodologies supported/Immunoassay methodologies	photometry, potentiometry, colorimetric, immuno-rate, turbidimetric, spectrophotometric	photometry, potentiometry (ISE), thin film reflectance/homogeneous EMIT, microparticle agglutination, enhanced chemiluminescence	potentiometry, colorimetric, rate, immuno-rate
Number of direct ion-selective electrode channels Number of different measured assays onboard simultaneously Number of different assays programmed and calibrated at once Number of user-definable (open) channels/Number active simultaneously Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when third-party reagents used Walkaway capacity in minutes/Specimens/Tests or assays Uses disposable cuvettes/Maximum number stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	3 125 125 20/10 125/100 48 hours/14 days/yes (10°C) yes yes yes varies/160/8,940 yes/348 no/— 2 µL available (not included)/no no/— <60 no special sample cup required/35 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	3 150 150 20/10 150/100 48 hours/30 days/yes (2°–8°C) yes yes yes varies/90/11,440 yes/348 no/— 2 µL available (not included)/no no/0 idle: 60; operational: 65 no special sample cup required/35 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	3 60 60 — 60/18, 50, 60 48 hours/14 days/no yes yes — varies/40/3,600 — — 6 µL available (not included)/no no/— 61 no special sample cup required/35 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes
Reagent bar-code reading capability Bar code placement per CLSI standard Auto2A	yes yes	yes yes	yes yes
Onboard test auto inventory (determines volume in container) Measures number of tests remaining/Short sample detection/Clot detection Hemolysis/Turbidity detection-quantitation Sample volume can be reduced Increased to rerun out-of-linear-range high/low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse	yes yes/yes/yes yes/yes system autodilutes no/no yes no/yes at lot change/at lot change/at lot change/at lot change	yes yes/yes/yes yes/yes system autodilutes no yes no/yes reagent lot change/reagent lot change/reagent lot change/reagent lot change	yes yes/yes/yes no/no no no no/yes reagent lot changes
Automatic shutdown programmable/Startup programmable	no/no	no/no	no/no
Stat time to completion of all analytes and throughput per hour for: • Sodium, potassium, chloride, TCO2 • Sodium, potassium, chloride, TCO2, glucose, urea, creatinine • Albumin, direct and total bilirubin, AST, ALT, ALP	5.5 minutes, 100 specimens 5.75 minutes, 90 specimens 7.5 minutes, 60 specimens	5.5 minutes, 100 specimens 5.75 minutes, 90 specimens 7.5 minutes, 60 specimens	6 minutes, 60 specimens 6 minutes 24 seconds, 40 specimens 6 minutes 40 seconds, 44 specimens
Typical time delay from ordering stat test to aspiration of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot numbers per analyte System can automatically transfer QC results to LIS	10 seconds once per 24 hours/yes yes/yes yes	about 10 seconds once per 24 hours/yes yes/yes yes	12 seconds once per 24 hours/yes yes/yes yes
Data-management capability/Instrument vendor supplies LIS interface	onboard/no	onboard/no	onboard/no (optional)
Interfaces to what LISs up and running in active user sites	all major LIS vendors	all major LIS vendors	all major LIS vendors
Bidirectional interface capability Uses LOINC to transmit orders and results across interface How labs get LOINC codes for reagent kits	yes (broadcast download and host query) no LOINC database	yes (broadcast download and host query) no LOINC database	yes (broadcast download) no —
Interface available (or will be) to automated specimen-handling system	yes (enGen LAS)	yes (enGen LAS)	yes (enGen LAS)
Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component On-site time of service engineer Mean time between failures/Mean time to repair failures Average time to complete maintenance by lab personnel	yes/yes/yes 4–8 hours — daily: 9 minutes; weekly: 5 minutes; monthly: 31 minutes	yes/yes/yes 4–8 hours — —	no/yes/yes varies by location, usually 4–8 hours — —
Onboard maintenance records/Maintenance training demo module Training provided with instrument purchase	yes, includes audit trail/yes varies on site, 5 days at company offices	yes, includes audit trail/yes 5 days on site, 5 days at company offices	no/yes 3 days on site, 5 days at company offices
Distinguishing product features (supplied by company)	standardized reagents, consumables, and software with other Vitros systems; MicroSlide technology provides low cost per reportable result and high reagent efficiency without the maintenance, preparation, carryover, and interference associated with traditional water-based and indirect ISE systems; no plumbing, drains, vents, or deionized water required; all waste is contained in used test slides or disposable cuvette; onboard e-Connectivity interactive management system	capability to add or remove reagents and consumables, and empty solid and liquid waste while operating; sample-centered processing integration approach eliminates need to move sample trays or aliquote samples between chemistry and immunoassay processing modules; integrates chemistry, immunoassay, and infectious-disease testing, and process them in parallel; integrated MicroTip technology expands menu availability, such as DATs, TDMS, specific proteins, %HbA1c and user-defined channels; MicroSensor technology detects interfering levels of hemolysis, icterus, and turbidity; eConnectivity assists with remote diagnostics, software, and test parameter downloads and updates	MicroSlide technology provides low cost per reportable result and high reagent efficiency without the maintenance, preparation, carryover, and interference associated with traditional water-based and indirect ISE systems; QC procedures are required once each day and calibration intervals up to six months with minimal interferences from hemolysis, lipemia; no plumbing, drains, vents, or deionized water required; all waste is contained in used test slides that are disposed of daily

*Note: a dash in lieu of an answer means company did not answer question or question is not applicable*

## Chemistry analyzers for mid- and high-volume laboratories

Part 11 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>HIGH</b>	<b>MID</b>
	<b>Ortho-Clinical Diagnostics</b> Mark Steelman msteelma@its.inj.com 1001 U.S. Route 202, Raritan, NJ 08869 585-453-3420 www.orthoclinical.com	<b>Randox Laboratories Ltd</b> Graeme McNeill graeme.mcneill@randox.com 515 Industrial Blvd., Kearneysville, WV 25430 304-728-2890 www.randox.com
<b>Name of instrument/First year sold in U.S.</b>	VITROS 5,1 FS Chemistry System/2004	RX Imola/2006
<b>List price/Total No. sold in 2011</b>	\$225,000/—	—/—
<b>Number of units in clinical use in U.S./Outside U.S.</b>	>1,600 worldwide	—
<b>Where designed/Manufactured/Where reagents manufactured</b>	U.S./U.S./U.S.	Japan/Japan/United Kingdom
<b>Operational type/Reagent type</b>	random access, discrete, continuous random access/self-contained single-use cartridges, packages, slides; user-defined assay capability	random access/self-contained multi-use cartridges, packages, slides
<b>Sample handling system/Model type</b>	universal sample tray/floor standing	ring/benchtop
<b>Dimensions in inches (H × W × D)/Footprint in square feet</b>	52.5 × 92.2 × 33.4/21.4	27 × 38 × 23/2.3
<b>Number of tests for which analyzer has FDA-cleared applications</b>	>70	>100
<b>Tests released for clinical use in last 12 months</b>	—	haptoglobin, ceruloplasmin, salicylate, acetaminophen, txb cardio, H-FABP
<b>Tests cleared but not released for clinical use</b>	—	—
<b>Tests not available in U.S. but submitted for 510(k) clearance</b>	—	—
<b>Tests not available in U.S. but available in other countries</b>	—	—
<b>Research-use-only assays</b>	—	—
<b>Tests in development</b>	—	liquid CK, liquid CK-MB, D-dimer
<b>Methodologies supported/Immunoassay methodologies</b>	photometry, potentiometry, immuno-rate, turbidimetric, colorimetric, spectrophotometric/—	photometry, potentiometry (ISE), latex-enhanced immunoturbidimetric/—
<b>Number of direct ion-selective electrode channels</b>	3 (direct)	3
<b>Number of different measured assays onboard simultaneously</b>	125	63
<b>Number of different assays programmed and calibrated at once</b>	125	63
<b>Number of user-definable (open) channels/Number active simultaneously</b>	20/10	10/10
<b>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</b>	125/up to 100	63/50 to 11,250
<b>Shortest/Median onboard reagent stability/Refrigerated onboard</b>	48 hours/14 days/yes (10°C)	8 hours/28 days/yes (8°–15°C)
<b>Multiple reagent configurations supported</b>	yes	yes
<b>Reagent container placed directly on system for use</b>	yes	yes
<b>Instrument has same capabilities when third-party reagents used</b>	yes	no
<b>Walkaway capacity in minutes/Specimens/Tests or assays</b>	varies/160/8,940	664/72/76,115
<b>Uses disposable cuvettes/Maximum number stored</b>	yes/348	no/90
<b>Uses washable cuvettes/Replacement frequency</b>	no/disposable	yes/5 years
<b>Minimum sample volume aspirated precisely at one time</b>	2 µL	2 µL
<b>Supplied with UPS (backup power)/Requires floor drain</b>	available (not included)/no	no/yes
<b>Requires dedicated water system/Water consumption per hour</b>	no/—	yes/18 L
<b>Noise generated in decibels</b>	<60	75
<b>Dedicated pediatric sample cup/Dead volume</b>	no special sample cup required/35 µL	yes/50 µL
<b>Primary tube sampling/Pierces caps on primary tubes</b>	yes/no	yes/no
<b>Sample bar-code reading capability/Autodiscrimination</b>	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes
<b>Reagent bar-code reading capability</b>	yes	yes
<b>Bar code placement per CLSI standard Auto2A</b>	yes	—
<b>Onboard test auto inventory (determines volume in container)</b>	yes	yes
<b>Measures number of tests remaining/Short sample detection/Clot detection</b>	yes/yes/yes	yes/yes/yes
<b>Hemolysis/Turbidity detection-quantitation</b>	yes/yes	yes/yes
<b>Sample volume can be reduced</b>	system autodilutes	yes
<b>Increased to rerun out-of-linear-range high/low results</b>	no	yes
<b>Autocalibration or autocalibration alert</b>	no	yes
<b>Calibrants stored onboard/Multipoint calibration supported</b>	no/yes	yes/yes
<b>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</b>	reagent lot changes	daily/28 days/7 days/28 days
<b>Automatic shutdown programmable/Startup programmable</b>	no/no (instrument maintained in ready mode)	yes/yes
<b>Stat time to completion of all analytes and throughput per hour for:</b>		
• Sodium, potassium, chloride, TCO2	5.5 minutes, 100 specimens	13.15 minutes, 80 specimens
• Sodium, potassium, chloride, TCO2, glucose, urea, creatinine	5.75 minutes, 90 specimens	13.43 minutes, 80 specimens
• Albumin, direct and total bilirubin, AST, ALT, ALP	7.5 minutes, 60 specimens	13.15 minutes, 67 specimens
<b>Typical time delay from ordering stat test to aspiration of sample</b>	~10 seconds	30 seconds
<b>How often QC required/Onboard SW capability to review QC</b>	once per 24 hours/yes	recommend 2 levels run per day/shortest: daily; longest: customer's discretion/yes
<b>Onboard real-time QC/Support multiple QC lot numbers per analyte</b>	yes/yes	yes/yes
<b>System can automatically transfer QC results to LIS</b>	yes	yes/yes
<b>Data-management capability/Instrument vendor supplies LIS interface</b>	onboard (optional add-on)/no	onboard/no
<b>Interfaces to what LISs up and running in active user sites</b>	all major LIS vendors	no
<b>Bidirectional interface capability</b>	yes (broadcast download and host query)	yes (host query)
<b>Uses LOINC to transmit orders and results across interface</b>	no	no
<b>How labs get LOINC codes for reagent kits</b>	LOINC database	—
<b>Interface available (or will be) to automated specimen-handling system</b>	yes (enGen LAS)	no
<b>Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component</b>	yes/yes/yes	no/yes/yes
<b>On-site time of service engineer</b>	varies by location; usually 4–8 hours	within 24 hours
<b>Mean time between failures/Mean time to repair failures</b>	—	2 per 3 years/within 8 working hours
<b>Average time to complete maintenance by lab personnel</b>	—	daily 5 minutes; weekly: 15 minutes; monthly: 1 hour
<b>Onboard maintenance records/Maintenance training demo module</b>	no/yes	no/no
<b>Training provided with instrument purchase</b>	yes	3 days on site
<b>Distinguishing product features (supplied by company)</b>	MicroSlide technology provides low cost per reportable result and high reagent efficiency without the maintenance, preparation, carryover, and interference associated with traditional water-based and indirect ISE systems; QC required once each day and calibration intervals up to lot change with minute interferences from hemolysis, lipemia; no plumbing, drains, vents, or deionized water required; all waste is contained in used test slides or disposable cuvette; eConnectivity interactive management system onboard	benchtop analyzer provides consolidation of testing in an established compact platform; dedicated multi-speed mixers allow optimum mixing for each assay; direct ISE prevents pseudohyponatremia; crash, liquid level, bubble, and clot detection; large clinical test menu; stat capabilities; user-friendly software

*Note: a dash in lieu of an answer means company did not answer question or question is not applicable*

## Chemistry analyzers for mid- and high-volume laboratories

Part 12 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>HIGH</b>	<b>MID</b>
	<b>Roche Diagnostics</b> Sheila Brewer sheila.brewer@roche.com 9115 Hague Rd., Indianapolis, IN 46250 317-521-2000 us.labsystems.roche.com	<b>Roche Diagnostics</b> Adam Sterle adam.sterle@roche.com 9115 Hague Rd., Indianapolis, IN 46250 317-521-2000 us.labsystems.roche.com
<b>Name of instrument/First year sold in U.S.</b>	cobas 8000 modular analyzer series (cobas c 702, cobas c 701, cobas c 502, cobas e 602)/2010	cobas 6000 analyzer series (cobas c 501, e 601)/2006
<b>List price/Total No. sold in 2011</b>	—/—	—/>250
<b>Number of units in clinical use in U.S./Outside U.S.</b>	>109/>1,570	>1,678/ >9,490
<b>Where designed/Manufactured/Where reagents manufactured</b>	Japan/Japan/Germany	Japan/Japan/U.S., Germany
<b>Operational type/Reagent type</b>	random access, continuous random access/self-contained single-use cartridges/packages/slides	continuous random access/self-contained multi-use cartridges, packages, slide
<b>Sample handling system/Model type</b>	five-position rack/floor standing	five-position rack/floor standing
<b>Dimensions in inches (H × W × D)/Footprint in square feet</b>	varies based on configuration	varies based on configuration
<b>Number of tests for which analyzer has FDA-cleared applications</b>	>145	>160
<b>Tests released for clinical use in last 12 months</b>	c 502: partner channels for homocysteine and freelite chain kappa and lamda, CEDIA carbamazepine, DRI methadone metabolite, and DRI oxycodone assays; gentamicin; c501/c502: albumin bromocresol purple; OF opiates, cocaine, amphetamine; e601/e602: hGH, anti-HAV (IgM and IgG)	c 501: ferritin gen.4, (BCP)triglycerides/glycerol blanked, amphetamines II; c501/c502 albumin bromocresol purple; OF opiates, cocaine, amphetamine; e601: anti-HBc IgM; RBC folate, estradiol II; ferritin (200), troponin T stat anti-HAV IgM, rubella IgM, testosterone II, pro BNP STAT; e601/e602: hGH, Anti-HAV (IgM and IgG)
<b>Tests cleared but not released for clinical use</b>	—	—
<b>Tests not available in U.S. but submitted for 510(k) clearance</b>	vit. D, HE4, thyroglobulin, PCP and metamphetamine oral fluid	vit. D, HE4, thyroglobulin, PCP and metamphetamine oral fluid
<b>Tests not available in U.S. but available in other countries</b>	free β-HCG, PAPP-Am, PTH (1-84), anti-HBc, anti-HBc IgM, HBsAg, anti-HBe, HIV Ag, HIV Ag confirmatory test, HIV combi, HSV type 1, HSV type 2, toxo IgM, CMV IgG, CMV IgM CA 72-4, cyfra 21-1, NSE, HE4, digitoxin, troponin T high sensitive, troponin T high sensitive stat, Tg confirmatory test, PLGF, SFLT-1, procalcitonin, interleukin 6, vitamin D, HE4, anti HBc, thyroglobulin	free β-HCG, PAPP-Am, PTH (1-84), anti-HBc, anti-HBc IgM, HBsAg, anti-HBe, HIV Ag, HIV Ag confirmatory test, HIV combi, HSV type 1, HSV type 2, toxo IgM, CMV IgG, CMV IgM CA 72-4, cyfra 21-1, NSE, HE4, digitoxin, troponin T high sensitive, troponin T high sensitive stat, Tg confirmatory test, PLGF, SFLT-1, procalcitonin, interleukin 6, vitamin D, HE4, anti HBc, thyroglobulin
<b>Research-use-only assays</b>	sFLT1, PIGF (not for use in diagnostic procedures)	sFLT1, PIGF (not for use in diagnostic procedures)
<b>Tests in development</b>	THC oral fluid, chromate (SV), creatinine (SV), nitrite (SV), oxidant (SV), pH (SV), specific gravity (SV), lidocaine, cycloproine, tacrolimus, sirolimus, troponin T high sensitive, troponin T high sensitive stat, procalcitonin, IL6, toxo IgM, syphilis, HSV Type I and II, CMV IgM and IgG, anti HBc, anti HBc IgM, total vitamin D, HSV type 1, HSV type 2, IGF-1, HIV combi, HE4, PTH 1-84, others	THC oral fluid, chromate (SV), creatinine (SV), nitrite (SV), oxidant (SV), pH (SV), specific gravity (SV), lidocaine, cycloproine, tacrolimus, sirolimus, troponin T high sensitive, troponin T high sensitive stat, procalcitonin, IL6, toxo IgM, syphilis, HSV type I and II, CMV IgM and IgG, anti HBc, anti HBc IgM, total vitamin D, HSV type 1, HSV type 2, IGF-1, HIV combi, HE4, PTH 1-84, others
<b>Methodologies supported/Immunoassay methodologies</b>	photometry, potentiometry (ISE), electrochemiluminescence/electrochemiluminescence on cobas e 602	photometry, potentiometry (ISE), electrochemiluminescence/electrochemiluminescence on cobas e 601
<b>Number of direct ion-selective electrode channels</b>	3 indirect	3
<b>Number of different measured assays onboard simultaneously</b>	up to 283	88
<b>Number of different assays programmed and calibrated at once</b>	>300	>100
<b>Number of user-definable (open) channels/Number active simultaneously</b>	varies/all	40 per system/all
<b>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</b>	283/3,000	148 (plus 3 ISE)/100–800
<b>Shortest/Median onboard reagent stability/Refrigerated onboard</b>	96 hours/60 days/yes (5°–20°C)	21 days/>60 days/yes (5°–20°C)
<b>Multiple reagent configurations supported</b>	yes	yes
<b>Reagent container placed directly on system for use</b>	yes	yes
<b>Instrument has same capabilities when third-party reagents used</b>	yes	yes
<b>Walkaway capacity in minutes/Specimens/Tests or assays</b>	varies based on configuration/300/—	varies/250/—
<b>Uses disposable cuvettes/Maximum number stored</b>	no	no
<b>Uses washable cuvettes/Replacement frequency</b>	yes/monthly	yes/once per month
<b>Minimum sample volume aspirated precisely at one time</b>	0.1 µL	1.5 µL
<b>Supplied with UPS (backup power)/Requires floor drain</b>	yes/yes	yes/yes
<b>Requires dedicated water system/Water consumption per hour</b>	yes/10–36 L	yes/10–12 L
<b>Noise generated in decibels</b>	<85	≤65
<b>Dedicated pediatric sample cup/Dead volume</b>	yes/50 µL	yes/50 µL
<b>Primary tube sampling/Pierces caps on primary tubes</b>	yes/no	yes/no
<b>Sample bar-code reading capability/Autodiscrimination</b>	on sample transport, shortly before sample is aspirated (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes
<b>Reagent bar-code reading capability</b>	yes	yes
<b>Bar code placement per CLSI standard Auto2A</b>	yes	yes
<b>Onboard test auto inventory (determines volume in container)</b>	yes	yes
<b>Measures number of tests remaining/Short sample detection/Clot detection</b>	yes/yes/yes	yes/yes/yes
<b>Hemolysis/Turbidity detection-quantitation</b>	yes/yes	yes/yes
<b>Sample volume can be reduced</b>	yes	yes
<b>Increased to rerun out-of-linear-range high/low results</b>	yes	yes
<b>Autocalibration or autocalibration alert</b>	yes	yes
<b>Calibrants stored onboard/Multipoint calibration supported</b>	no/yes	no/yes
<b>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</b>	24 hours/typically by lot/bottle change/typically by lot	24 hours/once per lot/varies/once per lot
<b>Automatic shutdown programmable/Startup programmable</b>	yes/yes	yes/yes
<b>Stat time to completion of all analytes and throughput per hour for:</b>		
• Sodium, potassium, chloride, TCO2	4.5 minutes, 600 specimens	5.5 minutes, 133–266 specimens
• Sodium, potassium, chloride, TCO2, glucose, urea, creatinine	4.5 minutes, 600–1,800 specimens	7.5 minutes, 150–300 specimens
• Albumin, direct and total bilirubin, AST, ALT, ALP	10.5 minutes, 285–855 specimens	10.5 minutes, 85–170 specimens
<b>Typical time delay from ordering stat test to aspiration of sample</b>	<1 minute	<1 minute
<b>How often QC required/Onboard SW capability to review QC</b>	24 hours/shortest: 24 hours; longest: 24 hours	typically once per 24 hours
<b>Onboard real-time QC/Support multiple QC lot numbers per analyte</b>	yes/yes	yes/yes
<b>System can automatically transfer QC results to LIS</b>	yes/yes	yes
<b>Data-management capability/Instrument vendor supplies LIS interface</b>	onboard (optional add-on)/no	onboard (optional add-on)/no
<b>Interfaces to what LISs up and running in active user sites</b>	all major LIS vendors	all major LIS vendors
<b>Bidirectional interface capability</b>	yes (broadcast download and host query)	yes (broadcast download and host query)
<b>Uses LOINC to transmit orders and results across interface</b>	yes	yes
<b>How labs get LOINC codes for reagent kits</b>	Web site	Web site
<b>Interface available (or will be) to automated specimen-handling system</b>	yes, Roche Diagnostics MPA system	yes, Roche Diagnostics MPA system
<b>Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component</b>	yes/yes/yes	yes/yes/yes
<b>On-site time of service engineer</b>	<8 hours	<8 hours
<b>Mean time between failures/Mean time to repair failures</b>	averages 203 days per module	averages 180 days per module
<b>Average time to complete maintenance by lab personnel</b>	4–5 minutes hands-on daily maintenance	3–5 minutes of hands-on daily maintenance
<b>Onboard maintenance records/Maintenance training demo module</b>	yes/yes	yes (includes audit trail of who replaced parts)/yes
<b>Training provided with instrument purchase</b>	varies on site, 5 days at vendor offices	varies on site, 5 days at vendor offices
<b>Distinguishing product features (supplied by company)</b>	24 modular configurations for a range of throughput and consolidation needs; up to four modules per system; high speed: 9,800 tests per hour; innovative design elements: intelligent sample routing with fast transportation and return lines, independent processing lines within each module, the module sample buffer, ready-to-use harmonized reagent cassette concept	flexible modular system—can be upgraded on site; second-generation, integrated platform; ready-to-use bar-coded reagents; automation connectivity; small sample size
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>		

## Chemistry analyzers for mid- and high-volume laboratories

Part 13 of 14	<b>MID</b>	<b>MID</b>	<b>HIGH</b>
See <a href="http://captodayonline.com/productguides">captodayonline.com/productguides</a> for an interactive version of guide	Siemens Healthcare Diagnostics Inc. Matthew Fitzgerald matthew.t.fitzgerald@siemens.com 1717 Deerfield Rd., Deerfield, IL 60015 847-236-7404 www.usa.siemens.com/diagnostics	Siemens Healthcare Diagnostics Inc. Jason F. Ong jason.f.ong@siemens.com 1717 Deerfield Rd., Deerfield, IL 60015 847-236-7328 www.usa.siemens.com/diagnostics	Siemens Healthcare Diagnostics Inc. Jason F. Ong jason.f.ong@siemens.com 1717 Deerfield Rd., Deerfield, IL 60015 847-236-7328 www.usa.siemens.com/diagnostics
Name of instrument/First year sold in U.S. List price/Total No. sold in 2011 Number of units in clinical use in U.S./Outside U.S. Where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	Dimension Vista 500 Intelligent Lab System/2009 \$278,271/— >400/>100 U.S./U.S./U.S., Germany batch, continuous random access/self-contained multi-use flex containers	ADVIA 1800/2006 \$299,000/— —/— Japan/Japan/Ireland random access/open reagent system	ADVIA 2400/2003 \$305,000/— —/— Japan/Japan/Ireland random access/open reagent system
Sample handling system/Model type	sample rack and aliquot plate system/floor standing	carousel rack-handler option, automation option/floor standing	carousel, rack-handler option, automation option/floor standing
Dimensions in inches (H × W × D)/Footprint in square feet	55.5 × 84.75 × 43.875/26	45 × 58 × 34/14	1,157 × 1,711 × 934 mm/—
Number of tests for which analyzer has FDA-cleared applications Tests released for clinical use in last 12 months	>125, includes vendor-supported applications 10	>100 ferritin, α1-acid glycoprotein, concentrated carbon dioxide, concentrated glucose hexokinase, concentrated glucose oxidase	>100 ferritin, α1-acid glycoprotein, concentrated carbon dioxide, concentrated glucose hexokinase, concentrated glucose oxidase
Tests cleared but not released for clinical use	—	—	—
Tests not available in U.S. but submitted for 510(k) clearance	—	neonatal bilirubin, tricyclics, serum benzo, serum barb	—
Tests not available in U.S. but available in other countries	—	—	—
Research-use-only assays	—	—	—
Tests in development	fertility panel, plasma proteins, hormones, infectious disease; LOCI vitamin D, cortisol, BNP, and intact PTH	ecstasy	—
Methodologies supported/Immunoassay methodologies	nephelometry/LOCI advanced chemiluminescence, EMIT technology, particle enhanced turbidimetric immunoassay (PETINIA), affinity column mediated immunoassay (ACMIA)	photometry, potentiometry, turbidimetric	photometry, potentiometry turbidimetric/—
Number of direct ion-selective electrode channels	3 (indirect)	3	3
Number of different measured assays onboard simultaneously	>100	52 colorimetric, 3 ISE	46 colorimetric, 3 ISE
Number of different assays programmed and calibrated at once	>100	100	100
Number of user-definable (open) channels/Number active simultaneously	10/>100	100/52 (plus 3 ISE)	100/49
Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set	100/20 to 1,200	52/850	49/850
Shortest/Median onboard reagent stability/Refrigerated onboard	24 hours/30 days/yes (2°–8°C)	7 days/45 days/yes	7 days/45 days/yes
Multiple reagent configurations supported	no	yes	yes
Reagent container placed directly on system for use	yes	yes	yes
Instrument has same capabilities when third-party reagents used	yes	yes	yes
Walkaway capacity in minutes/Specimens/Tests or assays	>45/150/61,404	32,000 photometric	32,000 photometric
Uses disposable cuvettes/Maximum number stored	yes/>1,600 washed disposal cuvettes and 1,000 LOCI vessels	no/221	no/340
Uses washable cuvettes/Replacement frequency	yes/automatic as needed	yes/every 4 months	yes/every 4 months
Minimum sample volume aspirated precisely at one time	50 µL	2 µL of diluted specimen	2 µL of diluted specimen
Supplied with UPS (backup power)/Requires floor drain	yes/no	yes/yes	yes/yes (or sink)
Requires dedicated water system/Water consumption per hour	no/10.8 L	yes/25 L	yes/40 L
Noise generated in decibels	<65	<45	<50
Dedicated pediatric sample cup/Dead volume	no/10 µL, if using small sample cup	yes/<50 µL	yes/~50 µL
Primary tube sampling/Pierces caps on primary tubes	yes/no	yes/no	yes/no
Sample bar-code reading capability/Autodiscrimination	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, UPC, Codabar, codes 39 and 128)/yes	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/—	yes/—
Reagent bar-code reading capability	yes	yes	yes
Bar code placement per CLSI standard Auto2A	yes	yes	yes
Onboard test auto inventory (determines volume in container)	yes	yes	yes
Measures number of tests remaining/Short sample detection/Clot detection	yes/yes/yes	yes/yes/yes	yes/yes/yes
Hemolysis/Turbidity detection-quantitation	yes/yes	yes/yes	yes/yes
Sample volume can be reduced	no	yes	yes
Increased to rerun out-of-linear-range high/low results	no	yes	yes
Autocalibration or autocalibration alert	yes	yes	yes
Calibrants stored onboard/Multipoint calibration supported	yes/yes	yes/yes	yes/yes
Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse	4 hours, automatic/30–90 days/30 days/30 days	daily/45 days/30 days/30 days	daily/45 days/30 days/30 days
Automatic shutdown programmable/Startup programmable	no/no	yes/yes	yes/yes
Stat time to completion of all analytes and throughput per hour for: • Sodium, potassium, chloride, TC02	1.9 minutes, 166 panels	5 minutes, —	5 minutes, —
• Sodium, potassium, chloride, TC02, glucose, urea, creatinine	5.5 minutes, 125 specimens	10 minutes, —	10 minutes, —
• Albumin, direct and total bilirubin, AST, ALT, ALP	9.4 minutes, 83 specimens	10 minutes, —	10 minutes, —
Typical time delay from ordering stat test to aspiration of sample	<2 minutes	10 seconds	10 seconds
How often QC required/Onboard SW capability to review QC	24 hours/yes	per laboratory protocol/—	per laboratory protocol/yes
Onboard real-time QC/Support multiple QC lot numbers per analyte	yes/yes	yes/yes	yes/yes
System can automatically transfer QC results to LIS	yes	yes	yes
Data-management capability/Instrument vendor supplies LIS interface	onboard/no	yes/—	yes/—
Interfaces to what LISs up and running in active user sites	all major LIS vendors	Soft, Misys, Cerner, Meditech, Multidata, Seacoast, Triple G, CCA, Computer Service and Support Q, Fletcher Flora, HDS, PSA consultants, Siemens, others	Soft, Misys, Cerner, Meditech, Multidata, Seacoast, Triple G, CCA, Computer Service and Support Q, Fletcher Flora, HDS, PSA consultants, Siemens, others
Bidirectional interface capability	yes (broadcast download and host query)	yes (broadcast download and host query)	yes (broadcast download and host query)
Uses LOINC to transmit orders and results across interface	no	yes	yes
How labs get LOINC codes for reagent kits	via e-mail	via e-mail and software	via software
Interface available (or will be) to automated specimen-handling system	yes, Advia automation	yes (all systems)	yes (with Advia WorkCell)
Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component	yes/yes/yes	yes/yes/yes	yes/yes/yes
On-site time of service engineer	2–8 hours	—	varies by location, generally <4 hours
Mean time between failures/Mean time to repair failures	—	—	—
Average time to complete maintenance by lab personnel	daily: 5 minutes; weekly: 10 minutes; monthly: 10 minutes	automated daily maintenance	automated daily maintenance
Onboard maintenance records/Maintenance training demo module	no/yes	yes/yes	—/yes
Training provided with instrument purchase	4 days at company offices	yes	yes
Distinguishing product features (supplied by company)	ultra-integrated chemistry platform with LOCI advanced chemiluminescence and nephelometry onboard; enhanced workflow efficiency with automated features, such as autocalibration, auto QC, and system twinning; proactive service and support through RealTime Solutions service	comprehensive menu; >100 assays, including chemistry, special chemistry, TDMs, DAUs, special proteins; long-life ISEs; 90,000 tests; unlimited open channels; third-party applications available; 3-second cycle time; 1,800 tests per hour; automation-ready; concentrated reagents available for high-volume chemistries, walkaway capability; clot detect; liquid level sense; auto reruns, dilutions, and repeats	comprehensive menu, including routine chemistry, TDMs, TAUs, special chemistry, and special proteins; provides unlimited open channels and walkaway capability (>450 specimens) when combined with the universal rack handler; offers micro-volume sample and reagent technology, multiple reagent wedge sizes, 2-second cycle time; fast throughput; sample-saver technology allows automatic repeats, dilutions, and reflex testing
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			

## Chemistry analyzers for mid- and high-volume laboratories

Part 14 of 14 <i>See captodayonline.com/productguides for an interactive version of guide</i>	<b>HIGH</b>	<b>MID</b>
	<b>Siemens Healthcare Diagnostics Inc.</b> <b>Matthew Fitzgerald</b> matthew.t.fitzgerald@siemens.com 1717 Deerfield Rd., Deerfield, IL 60015 847-236-7404 www.usa.siemens.com/diagnostics	<b>Siemens Healthcare Diagnostics Inc.</b> <b>Christina Tassone</b> christina.tassone@siemens.com 1717 Deerfield Rd., Deerfield, IL 60015 847-236-7222 www.usa.siemens.com/diagnostics
<b>Name of instrument/First year sold in U.S.</b>	Dimension Vista 1500 Intelligent Lab System/2006	Dimension EXL with LM Integrated Chemistry System/2009
<b>List price/Total No. sold in 2011</b>	\$543,500 (USD)/—	—
<b>Number of units in clinical use in U.S./Outside U.S.</b>	>500/>250	—
<b>Where designed/Manufactured/Where reagents manufactured</b>	U.S./U.S./U.S. and Germany	U.S./U.S./U.S.
<b>Operational type/Reagent type</b>	continuous random access/self-contained multi-use cartridges-packages	batch, random access, continuous random access/self-contained multi-use cartridges/packages/slides
<b>Sample handling system/Model type</b>	sample rack and aliquot plate system/floor standing	segmented sample wheel/floor-standing
<b>Dimensions in inches (H × W × D)/Footprint in square feet</b>	55 × 84 × 43/26	49 × 82 × 44 (without monitor)/25.1 (with printer shelf down)
<b>Number of tests for which analyzer has FDA-cleared applications</b>	>125	>90
<b>Tests released for clinical use in last 12 months</b>	10	mycophenolic acid (MPA)
<b>Tests cleared but not released for clinical use</b>	—	—
<b>Tests not available in U.S. but submitted for 510(k) clearance</b>	—	—
<b>Tests not available in U.S. but available in other countries</b>	—	—
<b>Research-use-only assays</b>	—	—
<b>Tests in development</b>	fertility panel, plasma proteins, cardiac, infectious disease; LOCI vitamin D, cortisol, BNP, intact PTH	LOCI B12, LOCI folate, LOCI BNP, LOCI cortisol, LOCI vitamin D
<b>Methodologies supported/Immunoassay methodologies</b>	photometry, potentiometry (ISE), advanced LOCI chemiluminescence technology, nephelometry, EMIT, PETINIA, PETIA, ACMA, turbidimetric	photometry, potentiometry, others/LOCI, ACMA, EMIT, PETINIA and turbidimetric
<b>Number of direct ion-selective electrode channels</b>	3 (indirect)	3
<b>Number of different measured assays onboard simultaneously</b>	>100 methods simultaneously/>100 methods	91
<b>Number of different assays programmed and calibrated at once</b>	>100	190
<b>Number of user-definable (open) channels/Number active simultaneously</b>	10/>100	10/10
<b>Number of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</b>	>100/20 to 1,200	91/15–360
<b>Shortest/Median onboard reagent stability/Refrigerated onboard</b>	24 hours/30 days/yes (2°–8°C)	24 hours/30 days/yes (2°–8°C)
<b>Multiple reagent configurations supported</b>	no	yes
<b>Reagent container placed directly on system for use</b>	yes	yes
<b>Instrument has same capabilities when third-party reagents used</b>	yes	yes
<b>Walkaway capacity in minutes/Specimens/Tests or assays</b>	>45 minutes/150/61,404	can be hours/60/>2,000
<b>Uses disposable cuvettes/Maximum number stored</b>	yes/>1,600 washed, disposable cuvettes and 1,000 LOCI vessels	yes/12,000
<b>Uses washable cuvettes/Replacement frequency</b>	yes/automatic	no/—
<b>Minimum sample volume aspirated precisely at one time</b>	50 µL	2 µL
<b>Supplied with UPS (backup power)/Requires floor drain</b>	yes/no	yes/no
<b>Requires dedicated water system/Water consumption per hour</b>	no/21.6 L	yes/up to 5 L
<b>Noise generated in decibels</b>	67	<75
<b>Dedicated pediatric sample cup/Dead volume</b>	no (can use routine sample cup)/10–20 µL	yes/30 µL
<b>Primary tube sampling/Pierces caps on primary tubes</b>	yes/no	yes/no
<b>Sample bar-code reading capability/Autodiscrimination</b>	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes	yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 and 128)/yes
<b>Reagent bar-code reading capability</b>	yes	yes
<b>Bar code placement per CLSI standard Auto2A</b>	yes	yes
<b>Onboard test auto inventory (determines volume in container)</b>	yes	yes
<b>Measures number of tests remaining/Short sample detection/Clot detection</b>	yes/yes/yes	yes/yes/yes
<b>Hemolysis/Turbidity detection-quantitation</b>	yes/yes	yes/yes
<b>Sample volume can be reduced</b>	no	yes
<b>Increased to rerun out-of-linear-range high/low results</b>	no	no
<b>Autocalibration or autocalibration alert</b>	yes	yes
<b>Calibrants stored onboard/Multipoint calibration supported</b>	yes/yes	yes (Na, K, Cl)/yes
<b>Typical calib. frequency for ISE/Metabolites/Therapeutic drugs/Drugs of abuse</b>	automatic every 4 hours/30–90 days/30 days/30 days	autocalibration every 2 hours/60–90 days/30 days
<b>Automatic shutdown programmable/Startup programmable</b>	no/no	no/no
<b>Stat time to completion of all analytes and throughput per hour for:</b>		
• Sodium, potassium, chloride, TC02	1.9 minutes, 166 panels	2 minutes (not TC02, EC02 for enzymatic), 62 specimens, 187 ISE and 437 photometric tests
• Sodium, potassium, chloride, TC02, glucose, urea, creatinine	5.5 minutes, 125 specimens	5.5 minutes (EC02 not TC02 [enzymatic]), 62 specimens, 187 ISE and 437 photometric tests
• Albumin, direct and total bilirubin, AST, ALT, ALP	9.4 minutes, 83 specimens	—
<b>Typical time delay from ordering stat test to aspiration of sample</b>	<2 minutes	24 seconds
<b>How often QC required/Onboard SW capability to review QC</b>	24 hours/yes	24 hours or with lot change /yes
<b>Onboard real-time QC/Support multiple QC lot numbers per analyte</b>	yes/yes	yes/yes
<b>System can automatically transfer QC results to LIS</b>	yes, via e-mail	no
<b>Data-management capability/Instrument vendor supplies LIS interface</b>	onboard/no	yes, onboard, optional add-on (EasyLink Informatics System, SW manufacturer: Siemens Healthcare Diagnostics)/yes (additional cost)
<b>Interfaces to what LISs up and running in active user sites</b>	all major LIS vendors	all major LIS vendors
<b>Bidirectional interface capability</b>	yes (broadcast download and host query)	yes (broadcast download, host query)
<b>Uses LOINC to transmit orders and results across interface</b>	no	no
<b>How labs get LOINC codes for reagent kits</b>	via e-mail	—
<b>Interface available (or will be) to automated specimen-handling system</b>	yes, Avia automation	—
<b>Modem servicing available/System can diagnose own malfunctions/ System can determine malfunctioning component</b>	yes/yes/yes	yes/yes/yes
<b>On-site time of service engineer</b>	2–8 hours	2–8 hours
<b>Mean time between failures/Mean time to repair failures</b>	—	—
<b>Average time to complete maintenance by lab personnel</b>	daily: 5 minutes; weekly: 10 minutes; monthly: 10 minutes	daily: 5 minutes; weekly: 10 minutes; monthly: 23 minutes
<b>Onboard maintenance records/Maintenance training demo module</b>	in development/yes	no/no
<b>Training provided with instrument purchase</b>	4 days on site, 4 days at company office	5 days on site, 4 days at company offices
<b>Distinguishing product features (supplied by company)</b>	intelligent lab system with customer-driven design, ultra-integration of technologies; LOCI advanced chemiluminescence and automation onboard for efficiency, simplicity, sensitivity, and convenience to provide an efficient workflow for the laboratory; autocalibration and auto QC onboard; proactive services and support through RealTime Solution	analyzer integrates general chemistry with homogeneous LOCI and heterogeneous immunoassays onboard; allows a single platform for more than 95 percent of most requested tests; eliminates sample splitting between general chemistry tests and immunoassays; fully automated onboard ISD assays; QCC PowerPak onboard; reagent management system standard

*Note: a dash in lieu of an answer means company did not answer question or question is not applicable*