Vendors selling simplicity and banking on the basics

Anne Ford

n today's global market, everyone seems to be thinking big, and highvolume hematology labs are no exception. Yet practicality still prevails.

"One area that is no longer in high demand is monoclonal antibody testing integrated into a routine hematology analyzer," says Bayer spokeswoman Nancy Lavon. "Although very attractive at first, these esoteric tests are not always practical for the routine hematology analyzer and may actually have a negative impact on workflow. There has been a return to the basics quality, simplicity, reliability."

Case in point: Beckman Coulter's electronic Interlaboratory Quality Assurance Program, or eIQAP. Whereas enrollees in the program's previous incarnation had to mail in diskettes containing their QA information so Beckman Coulter could upload the information to a master database, now laboratories can submit and access hematology QA data via the Internet. "It's proving to be a huge timesaver and is much more efficient for labs," says Alan Burton, Beckman's marketing director for cellular analysis products. "This program eliminates numerous clerical hassles and processing time."

The company is now launching Command Central, a combination of software and hardware. "Command Central is a particularly exciting development as it provides a single point of contact with all the connected instruments," says Burton. "Now a single user can access and monitor up to 12 Beckman Coulter instruments including hematology, chemistry, and immunoassay analyzers—all from one central workstation." Burton adds that Beckman Coulter will soon introduce a new version of its DL 2000 data manager, which "allows labs to consolidate and manage test information and apply decision rules from multiple hematology analyzers."

With Bayer's Advia CentraLink networking solution, meanwhile, labs that own multiple Advia 2120 analyzers can consolidate data management. "This provides the ability to review and edit results at any workstation, to review patient results and cytograms at any microscope station with electronic diff pad entry," Lavon says. "Additional workstations can be placed wherever necessary—for example, in the hematology supervisor's or pathologist's office."

The Advia 2120 system, released in April, is the company's newest hematology analyzer. Next year, Bayer plans to introduce the Advia Autoslide, which will integrate with the 2120 and provide automated slide making and staining. With regard to future trends, Lavon says she sees an increased demand for Web-based services.

Sysmex hematology marketing manager Brian Verne agrees. His company plans to launch a new online customer support service— SNCS, or Sysmex Network Customer Support-in 2005. SNCS "offers remote maintenance and quality control by linking customers using Sysmex products with the Sysmex technical assistance center via the Internet," he says. Laboratories will be able to instantly access their daily QC and peer group comparisons. They'll also be able to monitor equipment trouble and receive online remote-access support. SNCS, Verne adds, will be available for all Sysmex instruments.

Several companies have recently launched or plan to launch new applications on their existing analyzers or brand-new products. Beckman Coulter, for example, expected to release a new body fluid application on its Coulter LH 700 series analyzers at CAP TODAY press time. The new application, Burton says, "will allow labs to analyze cerebrospinal fluid, s e rous fluids, and synovial fluids that have been treated with hyaluronidase."

Sysmex, meanwhile, has received FDA clearance for its body fluids application, which includes synovial, plurals, and CSF, on its XE series of instruments. It also plans to add new capabilities in 2005, such as immature platelet fraction and reticulocyte hemoglobin equivalent on the XE instruments. Already on the market is Sysmex's IG Master software, which provides enumerated immature granulocyte counts.

Pending regulatory approval, Abbott Diagnostics will launch a highvolume hematology analyzer, called the Cell-Dyn Sapphire, in 2005, says Abbott public affairs manager Amy Woodworth. Abbott currently markets, as part of its Cell-Dyn series, the Cell-Dyn 4000, which offers measurements of argon-ion laser light scatter and focused-flow impedance and supports high-volume workloads. The company is developing additional Cell-Dyn instruments.

ABX reports that it is developing leukocyte differential staining using thiazole orange and flow cytometry analysis. At the same time, the company continues its integration with Horiba; it now represents the medical diagnostics branch of Horiba and is officially known as Horiba ABX Diagnostics. But the company's aim remains the same, says marketing director Tom Brown: "The goal at Horiba ABX is to continue to simplify the preanalytical, analytical, and postanalytical phases of the hematology process. We believe that expensive track systems can be eliminated through onboard auto-rerun and auto-reflex capabilities, streamlining the workflow process."

Finally, while Six Sigma and Lean principles are nothing new, the increasing demand for them is. Bayer's Lavon characterizes the rise in Six Sigma's popularity as "a more sophisticated approach to instrument selection," while Sysmex's Verne says the interest in Lean principles stems from cost constraints and the continuing shortage of qualified medical technologists. That, too, is why "customers continue to demand reliability and performance in the instruments they acquire," he adds. "More and more customers are not able to acquire a comparable backup analyzer. Reliable, feature-rich analyzers have become a need, whereas before they were a luxury. What was once thought of as a 'nice-tohave' feature will now become mandatory."

CAP TODAY's survey of high-volume hematology analyzers on pages 24–44 includes products from the aforementioned manufacturers. Vendors supplied the information listed. Readers interested in a particular analyzer should confirm that it has the stated features and capabilities.

Anne Ford is a writer in Chicago.

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Abbott Diagnostics Abbott Diagnostics Part 1 of 11 Hematology Business Unit **Hematology Business Unit** 5440 Patrick Henry Dr. 5440 Patrick Henry Dr. Santa Clara, CA 95054 Santa Clara, CA 95054 800-933-5535 800-933-5535 See related article, page 22 www.abbott.com www.abbott.com Name of instrument Cell-Dyn 3200 Cell-Dyn 3700 1997/1997 First year sold-installed in U.S./outside U.S. 1999/1999 No. units installed in U.S./outside U.S./list price >700/>1.500/\$165.000 >300/>500/\$180.000 SL Model. \$140.000 CS Model standard menu (left) plus: RDW, MPV Chartable standard menu (left) plus: RDW, MPV, retic #&%, IRF Test menu: All instruments have: WBC, RBC, Hb, Hct, MCV, •Laboratory MCH, MCHC, Plt, %&# neut, •Flags mono, lymph, eos, baso band #&%, IG #&%, variant lymph #&%, blast #&%, PCT, PDW, NRBC #&% band, IG, variant lymph, blast, PCT, PDW, NRBC #&% and retic scatter profile band, IG, variant lymph, blast, NRBC, NWBC, RRBC, FWBC, RBC morph., suspect populations, band, blast, variant lymph, IG, NRBC, RRBC, NWBC, LRI, high/low interp. message, LRI, URI, LURI, WBC URI, LURI, RBC morph., FWBC, high/low interp. message, WBC FDA-cleared tests but not clinically released none none Tests not available but submitted for clearance none none Tests in development none none For research use only atypical depolarization flag outside U.S. none 3-dimensional optical RBC analysis with advanced MCV measurement Tests unique to analyzer IRF MAPSS (Multi-Angle Polarized Scatter Sep.) MAPSS (Multi-Angle Polarized Scatter Sep.) 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CBCs per hr/max. CBCs & diffs. per hr 71/71 90/90 Recommended average frequency of calib. 6 months verification 6 months •Modes calibrated/parameters calibrated open & closed/WBC, RBC, Hb, MCV, Plt, MPV open & closed/WBC, RBC, Hb, MCV, Plt Frequency of blood/latex controls as per regulatory requirement/n/a as per regulatory requirement/n/a Min. specimen vol. open/closed/sample dead vol. closed 150 $\mu L/250$ $\mu L/1$ mL (sample loader) 130 µL/355 µL/1.0 mL Tube sampling supported yes (13x75 mm) yes Veterinary capability no yes Microsample capability yes yes Prepares microscopic slides automatically or flags yes (flags only) yes problems for slide prep If auto. slidemaker available, No. installed/list price 80/\$125,000 80/\$125,000 Archives patient data for later comparison yes yes Patient-specific archiving yes yes Max. archived data accessible when system online 10.000 results 10.000 results 10.000 results 10,000 results Memory capacity-numeric results-No. specimens Memory capacity—histo/cytograms-No. specimens •Stored in conjunction with CBC data 10.000 results 10.000 results yes yes •Histo/cytogram images & CBC data printed as 1 report yes yes Saved results can be recalled and retransmitted yes yes Saved data can be sorted for reprocessing or report transmission yes yes Performs delta checks no no Tags and holds results for followup, confirm. testing, or rerun yes yes Parameters for flags for holding samples are defined by user or vendor user or vendor Some results can be transmitted to LIS while others held yes yes Scattergram display: cell-specific color yes yes Histogram display: color with threshhold yes yes Choice of desired specimen &/or result info. displayed yes yes LIS interface formats supported proprietary proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient numeric and flag results, histograms and scatterplots, instrument to LIS; Information transferred on LIS interface demographics, orders, LIS to instrument-broadcast patient demographics, orders, LIS to instrument-broadcast

LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mont, or collation system yes package insert; www.e-abbott.com;800-323-9100 ves. proprietary yes package insert; www.e-abbott.com; 800-323-9100 ves_proprietary

Tabulation does not represent an endorsement by the College of Ame	rican Pathologists	Survey editor: Raymond D. Aller, MD
Distinguishing features	MAPSS cell-by-cell analysis provides a better diff.; focused flow 2-D optical RBC and Plt analysis provides better separation between microcytic RBCs and large Plts; uses only 3 reagents; 3-D MCV	MAPSS cell-by-cell analysis provides a better diff.; retic with reportable IRF (immature retic. fraction); 60-species veterinary package
Acquisition program based on cost-per-reportable result	yes	yes
Time required for maintenance by lab personnel Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	daily: 30 sec; weekly: 5 min; monthly: 10 min yes same day yes/no in development	daily: 30 sec; bi-weekly: 5 m in; monthly: 10 min yes same day yes/no in development
Bar-code symbologies read on tube Accommodates bar-code placement per NCCLS standard Auto2A	Codabar, codes 39 & 128, interl. 2 of 5 yes	Codabar, codes 39 & 128, interl. 2 of 5 yes
Optional data mgmt. or collation system Software features Interface avail. or planned to auto. specimen-handling system	yes, proprietary enhanced QC, data archiving, data collation from multiple instruments Lab-InterLink, MDS/Autolab, Roche (planned), Labotix	yes, proprietary enhanced QC, data archiving, data collation from multiple instruments Lab-InterLink (planned), MDS/AutoLab, Roche (planned), Labotix (planned)

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Survey editor: Raymond D. Aller, MD

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December 2004

High-volume hematology analyzers

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| Part 2 of 11 | | Hematology Business Unit | Nancy Lavon nancy.lavon.b@bayer.com

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| | | Santa Clara, CA 95054 | Tarrytown, NY 10591

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| | | 800-933-5535 | 800-431-1970

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| See related article, pa | ge 22 | www.abbott.com | www.bayerdiag.com

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| Name of instrument | | Cell-Dyn 4000 | Advia 120 Hematology System

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| First year sold-installe | | 1997/1997 | 1998/1998

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| No. units installed in u | .S./outside U.S./list price | >350/>500/\$250,000 | 800/3,500/\$169,000-\$189,000

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MCH, MCHC, Plt, %&# neut</td><td></td><td>viability fraction (WVF)</td><td>%: hypo, hyper, macro, micro; calc. Hb, MPXI;
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112.5 µL-aspir. vol./same/387 µL-dead vol.
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yes (250 µL) in Sarstedt Multivette & Becton Dickinson Microtainer tubes
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meric results–No. specimens
to/cytograms–No. specimens
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for followup, confirm. testing, or rerun
or holding samples are defined by
ansmitted to LIS while others held
ell-specific color
or with threshhold
imen &/or result info. displayed
upported
d on LIS interface
ed with results
des for reagent kits
r collation system
ned to auto. specimen-handling system
read on tube
de placement per NCCLS standard Auto2A
ttenance by lab personnel
records
tion of problem to engineer on site
mited to software problems</td><td>open-closed one proc./WBC, RBC, Hb, MCV, PH, MPV
as per regulatory requirement/n/a
112.5 µL-aspir. vol./same/387 µL-dead vol.
yes
(flags only)
80/\$125,000
yes
yes
10,000 results
10,000 results
10,000</td><td>open, closed, autosampler/all measured parameters
once per shift/not required
157 µL/157 µL/<300 µL (tube size depend ent)
yes (2, 3, 5, 7 mL—all sizes-open tube)
yes
yes
yes
Advia S60, >100/\$35,000
yes
no
10,000 samples
10,000
10,000
yes
yes
yes
yes
yes
yes
yes
yes
yes
yes</td></tr><tr><td>Recommended averag
•Modes calibrated/
Frequency of blood/lat
Min. specimen vol. op/
Tube sampling suppor
Veterinary capability
Microsample capability
Prepares microscopic
problems for slide p
If auto. slidemaker aver
Archives patient data
Patient-specific archiv
Max. archived data ac
Memory capacity—nu
Memory capacity—nu
Memory capacity—nu
Memory capacity—nu
Memory capacity—nu
Memory capacity—nu
Sotred in conjunct
•Histo/cytogram im
Saved results can be or
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Saved results can be tor
Saved results can be tor
Scattergram display: col
Choice of desired spec
LIS interface formats s
Information transferre
LOINC codes transmitt
How labs get LOINC co
Optional data mgmt. o
• Software features
Interface avail. or plan
Bar-code symbologies
Accommodates bar-coo
Time required for main
Onboard maintenance
Time from communica
Onboard diagnostics//
Mfr. can perform dag</td><td>parameters calibrated
ex controls
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slides automatically or flags
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to/cytograms–No. specimens
to/cytograms–No. specimens
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ecalled and retransmitted
ed for reprocessing or report transmission
or followup, confirm. testing, or rerun
or holding samples are defined by
ansmitted to LIS while others held
ell-specific color
or with threshhold
imen &/or result info. displayed
supported
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ed with results
des for reagent kits
r collation system
ned to auto. specimen-handling system
read on tube
de placement per NCCLS standard Auto2A
thenance by lab personnel
records
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mited to software problems
nostics via modem
ased on cost-per-reportable result</td><td>open-closed one proc./WBC, RBC, Hb, MCV, PH, MPV
as per regulatory requirement/n/a
112.5 µL-aspir. vol./same/387 µL-dead vol.
yes
no
yes (250 µL) in Sarstedt Multivette & Becton Dickinson Microtainer tubes
yes (flags only)
80/\$125,000
yes
yes
yes
10,000 results
10,000 results
10,000 results
10,000 results
10,000 results
10,000 results
yes
yes
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yes
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yes
ye</td><td>open, closed, autosampler/all measured parameters
once per shift/not required
157 µL/157 µL/<300 µL (tube size depend ent)
yes
yes
yes
yes
Advia \$60, >100/\$35,000
yes
no
10,000 samples
10,000
10,000
yes
yes
yes
yes
yes
yes
yes
yes
yes
yes</td></tr></tbody></table> |

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December 2004

High-volume hematology analyzers

Part 3 of 11			
Part 3 of 11		Bayer Diagnostics	Bayer Diagnostics
		Nancy Lavon nancy.lavon.b@bayer.com	Nancy Lavon nancy.lavon.b@bayer.com
		555 White Plains Rd.	555 White Plains Rd.
		Tarrytown, NY 10591	Tarrytown, NY 10591
		800-431-1970	800-431-1970
See related article, p	age 22	www.bayerdiag.com	www.bayerdiag.com
eee related an acto, p			mm.bujordiag.com
Name of instrument		Advia 70	Advia 2120 Hematology System
•	lled in U.S./outside U.S.	2001/2001	2004/2004
No. units installed in	U.S./outside U.S./list price	100/300/\$89,000	>60/>70/\$225,000
Test menu:	•Chartable	standard menu (left) plus: RDW, MPV	standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic %&4
All instruments have:	onarabio		CHCMr, cellular Hgb, MCVr; CSF: WBC, RBC, PMN, MN, neut, lymph, mo
WBC, RBC, Hb, Hct, MC	:v. •Laboratorv	none	% hypo, hyper, macro, micro; MPXI, % blast, PMN, MN, large PLT count
MCH, MCHC, Plt, %&# ne</td><td></td><td></td><td>fragment count; RBC ghost count</td></tr><tr><td>mono, lymph, eos, baso</td><td>•Flags</td><td>diff., WBC, N, B, L, RBC, ABN, PL, CI, PIt/RBC</td><td>_</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td>it not clinically released</td><td>-</td><td>none</td></tr><tr><td></td><td>ut submitted for clearance</td><td>-</td><td>none</td></tr><tr><td>Tests in developmen</td><td></td><td>-</td><td>NRBC, MPC, MPM</td></tr><tr><td>For research use onl</td><td></td><td>Pct, PDW</td><td>IRF, CSF, eos</td></tr><tr><td>Tests unique to analy</td><td>yzer</td><td>-</td><td>CHCM, HDW, CHr, CHCMr, cellular Hgb, MPC, MPM, CSF: WBC, RBC, PM</td></tr><tr><td></td><td></td><td></td><td>MN, neut, lymph, mono</td></tr><tr><td>Differential method(s</td><td>s) used</td><td>optical & enhanced impedance</td><td>peroxidase WBC—peroxidase cytochem. staining w/ light scatter &</td></tr><tr><td></td><td>,</td><td></td><td>absorption; baso—cytochem. stripping w/ 2-angle laser light scatter</td></tr><tr><td>Linearity:</td><td>•WBC count (10⁹/L)/RBC count (10¹²/L)</td><td>0.1-99/0.02-9.99</td><td>0.02–400; CSF WBC 0–5,000/0–7.0; CSF RBC 0–1,500</td></tr><tr><td>·····,·</td><td>•Hemoglobin (g/dL)/platelet (10⁹/L)</td><td>1.5–30/10–2,000</td><td>0-22.5/5-3,500</td></tr><tr><td></td><td>•MCV (fL) or Hct (%)</td><td>30–150 (MCV)</td><td>30–180 (MCV)</td></tr><tr><td>Precision:</td><td>•WBC count/RBC count</td><td>2.0%/1.2%</td><td>2.7%/1.2%</td></tr><tr><td>1 100131011.</td><td></td><td></td><td></td></tr><tr><td></td><td>•Hb/platelet</td><td>1.0%/3–10%</td><td>0.93%/2.93%</td></tr><tr><td></td><td>•MCV or Hct</td><td>1.0% (MCV)</td><td>0.78% (MCV)</td></tr><tr><td>Accuracy of outpart</td><td>ad diff compared with manual diff</td><td>neut% R>0.0 jumnh% D>0.0 mono% D=0.7 acc%/ D=0.0 hacc%/ D=0.5</td><td>neut% R=0.007 /vmnh% D=0.007 mana% D=0.042 acc% D=0.070</td></tr><tr><td>-</td><td>ted diff. compared with manual diff.,</td><td>neut% R>0.9, lymph% R>0.9, mono% R>0.7, eos% R>0.8, baso% R>0.5</td><td>neut% R=0.997, lymph% R=0.997, mono% R=0.943, eos% R=0.979,</td></tr><tr><td>per NCCLS H-20A</td><td>es:eWBC</td><td>in complete RBC lysis</td><td>baso% R=0.772, luc% R=0.944 incomplete BBC lysis (nerovidase only)</td></tr><tr><td>Interfering substance</td><td>€9.~ WDU</td><td>incomplete RBC lysis</td><td>incomplete RBC lysis (peroxidase only)</td></tr><tr><td></td><td>•RBC</td><td>cold anglutining</td><td>cold agglutinins, extreme sickle cell</td></tr><tr><td></td><td>•RBC •MCV or Hct</td><td>cold agglutinins extremely high white blood cell count (Hct)</td><td>cold agglutunins, extreme sickle cell none</td></tr><tr><td></td><td>•MCV of Hct •Platelet</td><td>RBC fragments</td><td>none</td></tr><tr><td></td><td>. 1010101</td><td></td><td></td></tr><tr><td></td><td>•Hb</td><td>lipemia, elevated WBC</td><td>extreme lipemia, high WBC, extreme high bili. interference w/ colorime</td></tr><tr><td></td><td>115</td><td></td><td>Hgb only, none with cellular Hgb</td></tr><tr><td>Interfering substance</td><td>es: differential</td><td>NRBCs, unlysed RBC, platelet clumps</td><td>inclomplete RBC lysis, complete myeloperox. deficiency</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>Age- and sex-specifi</td><td>-</td><td>yes</td><td>yes</td></tr><tr><td>Max. CBCs per hr/ma</td><td>ax. CBCs & diffs. per hr</td><td>70/70</td><td>120/120</td></tr><tr><td>Recommended avg.</td><td></td><td>every 6 months per governmental requirements</td><td>6 months</td></tr><tr><td></td><td>d/parameters calibrated</td><td>open & closed/all measured parameters</td><td>autosampler, closed, open/all measured parameters</td></tr><tr><td>Frequency of blood/l</td><td>atex controls</td><td>one level per shift/not required</td><td>once per shift/not required</td></tr><tr><td>Min. specimen vol. o</td><td>pen/closed/sample dead vol. closed</td><td>90 μL/180 μL/120 μL</td><td>175 μL/175 μL/<300 (tube size dependent)</td></tr><tr><td>Tube sampling supp</td><td>orted</td><td>yes (12x75)</td><td>yes (2, 3, 5, 7 mL—all sizes open)</td></tr><tr><td>Veterinary capability</td><td>,</td><td>no</td><td>available 2005</td></tr><tr><td>Microsample capabi</td><td>lity</td><td>yes</td><td>yes</td></tr><tr><td>• •</td><td>c slides automatically or flags</td><td>yes</td><td>if integrated to Advia Autoslide</td></tr><tr><td>problems for slide</td><td>• •</td><td></td><td></td></tr><tr><td>•</td><td></td><td>Advia \$60,>100/\$35,000</td><td>—</td></tr><tr><td>•</td><td>vailable, No. installed/list price</td><td></td><td></td></tr><tr><td>If auto. slidemaker a</td><td>· ·</td><td>Ves</td><td>Ves</td></tr><tr><td>If auto. slidemaker a</td><td>a for later comparison</td><td>yes ves</td><td>yes no</td></tr><tr><td>If auto. slidemaker a Archives patient data Patient-specific arch</td><td>a for later comparison living</td><td>yes</td><td>no</td></tr><tr><td>If auto. slidemaker a Archives patient data Patient-specific arch Max. archived data a</td><td>a for later comparison living accessible when system online</td><td>yes 100,000</td><td>no 10,000</td></tr><tr><td>If auto. slidemaker a Archives patient data Patient-specific arch Max. archived data a Memory capacity—r</td><td>a for later comparison living accessible when system online numeric results–No. specimens</td><td>yes 100,000 100,000</td><td>no 10,000 10,000</td></tr><tr><td>If auto. slidemaker a Archives patient data Patient-specific arch Max. archived data a Memory capacity—r Memory capacity—t</td><td>a for later comparison living accessible when system online numeric results-No. specimens listo/cytograms-No. specimens</td><td>yes 100,000 100,000 100,000</td><td>no 10,000 10,000 10,000</td></tr><tr><td>If auto. slidemaker a Archives patient dat. 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Patient-specific arch Max. archived data a Memory capacity—r Memory capacity—r •Stored in conjum •Histo/cytogram i Saved results can be Saved data can be so Performs delta checi Tags and holds resu Parameters for flags Some results can be Scattergram display: c</td><td>a for later comparison iving accessible when system online numeric results-No. specimens iisto/cytograms-No. specimens cition with CBC data mages & CBC data printed as 1 report e recalled and retransmitted rted for reprocessing or report transmission ks tts for followup, confirm. testing, or rerun for holding samples are defined by transmitted to LIS while others held cell-specific color olor with threshhold</td><td>yes 100,000 100,000 yes yes yes yes yes yes all results for that sample are transmitted at once yes yes</td><td>no 10,000 10,000 yes yes yes yes yes yes user or vendor yes yes yes</td></tr><tr><td>If auto. slidemaker a Archives patient dat. 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Patient-specific arch Max. archived data a Memory capacity—r Memory capacity—r •Stored in conjum •Histo/cytogram i Saved results can be Saved data can be so Performs delta checi Tags and holds resu Parameters for flags Some results can be Scattergram display: c</td><td>a for later comparison iving accessible when system online numeric results-No. specimens iisto/cytograms-No. specimens ction with CBC data mages & CBC data printed as 1 report e recalled and retransmitted rted for reprocessing or report transmission ks ts for followup, confirm. testing, or rerun for holding samples are defined by transmitted to LIS while others held : cell-specific color olor with threshhold ecimen &/or result info. displayed</td><td>yes 100,000 100,000 yes yes yes yes yes yes all results for that sample are transmitted at once yes yes</td><td>no 10,000 10,000 yes yes yes yes yes yes user or vendor yes yes yes</td></tr><tr><td>If auto. slidemaker a Archives patient dat. Patient-specific arch Max. archived data a Memory capacity—r •Stored in conjune •Histo/cytogram i Saved results can be Saved data can be so Performs delta checi Tags and holds resu Parameters for flags Some results can be Scattergram display: c Choice of desired sp</td><td>a for later comparison iving accessible when system online numeric results-No. specimens isto/cytograms-No. specimens ction with CBC data mages & CBC data printed as 1 report recalled and retransmitted rted for reprocessing or report transmission ks tts for followup, confirm. testing, or rerun for holding samples are defined by transmitted to LIS while others held c cell-specific color olor with threshhold ecimen &/or result info. displayed s supported</td><td>yes 100,000 100,000 100,000 yes yes yes yes no yes user all results for that sample are transmitted at once yes yes yes yes yes</td><td>no 10,000 10,000 10,000 yes yes yes yes yes user or vendor yes yes yes yes proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient</td></tr><tr><td>If auto. slidemaker a Archives patient dat. Patient-specific arch Max. archived data a Memory capacity—r •Stored in conjune •Histo/cytogram i Saved results can be Saved data can be so Performs delta check Tags and holds resul Parameters for flags Some results can be Scattergram display: c Choice of desired sp LLS interface formats</td><td>a for later comparison iving accessible when system online numeric results-No. specimens isto/cytograms-No. specimens ction with CBC data mages & CBC data printed as 1 report recalled and retransmitted rted for reprocessing or report transmission ks tts for followup, confirm. testing, or rerun for holding samples are defined by transmitted to LIS while others held c cell-specific color olor with threshhold ecimen &/or result info. displayed s supported</td><td>yes 100,000 100,000 100,000 yes yes yes yes no yes user all results for that sample are transmitted at once yes yes yes yes yes</td><td>no 10,000 10,000 yes yes yes yes yes yes yes yes</td></tr><tr><td>If auto. slidemaker a Archives patient dat. 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December 2004

High-volume hematology analyzers

Part 4 of 11		Beckman Coulter Inc. Martha M. Diaz/Cellular Analysis Marketing mmdiaz@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000	Beckman Coulter Inc. Martha M. Diaz/Cellular Analysis Marketing mmdiaz@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000
See related article, pag	ge 22	714-993-8847 www.beckmancoulter.com	714-993-8847 www.beckmancoulter.com
Name of instrument		LH 1500 Hematology Automation Series	Coulter LH 700 Series
First year sold–installe No. units installed in U	ed in U.S./outside U.S. .S./outside U.S./list price	2002/2003 >25/3/varies	2001 1,000/>1,100/LH 750: \$195,000; LH 755: \$367,500
Test menu: All instruments have:	•Chartable	standard menu (left) plus: RDW, MPV, retic %&#, IRF, graded RBC morph, NRBC %&#, TNC & RBC on CSF, synovial and serous fluids</td><td>standard menu (left) plus: RDW, MPV, retic #&%, IRF, MPV, graded RBC mo NRBC %&#, TNC & RBC on CSF, synovial and serous fluids</td></tr><tr><td>WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso</td><td></td><td> user-definable age-, gender-, &/or location-based ref.; intervals, action & critical limits; user-def. RBC morph.; user-selectable sensitivity for diff.,</td><td>— user-definable age-, gender-, &/or location-based ref.; intervals, action & critical limits; user-def. RBC morph.; gradient msgs. (=+, ++, +++); user-</td></tr><tr><td>FDA-cleared tests but Tests not available but</td><td>not clinically released t submitted for clearance</td><td>abnormal population suspect messages none none</td><td>selectable sensitivity for diff. abnormal population suspect messages — none</td></tr><tr><td>Tests in development</td><td></td><td>n/a</td><td>none</td></tr><tr><td>For research use only Tests unique to analyz</td><td>er</td><td>PCT, PDW, high light scatter retics, mean sphered cell volume (MSCV) NRBC, MSCV, body fluids</td><td>PCT, PDW, high light scatter retics, mean sphered cell volume NRBC, mean sphered cell volume</td></tr><tr><td>Differential method(s)</td><td>used</td><td>Coulter's 3-D VCS biophysical flow cytometry with IntelliKinetics, AccuGate & Accuflex technologies</td><td>Coulter's 3-D VCS biophysical flow cytometry with IntelliKinetics, Accu & Accuflex technologies</td></tr><tr><td>Linearity:</td><td>•WBC count (10⁹/L)/RBC count (10¹²/L)</td><td>0-400/0-8.0</td><td>0-400/0-8.0</td></tr><tr><td></td><td>•Hemoglobin (g/dL)/platelet (10⁹/L)</td><td>0-25/0-3,000</td><td>0–25/0–3,000</td></tr><tr><td>Propinion</td><td>•MCV (fL) or Hct (%)</td><td>50–200 (MCV) -1 70/ (-0.99/</td><td>50–200 (MCV)</td></tr><tr><td>Precision:</td><td>WBC count/RBC count Hb/platelet</td><td><1.7%/<0.8% <0.8%/<3.3%</td><td><1.7%/<0.8% <0.8%/<3.3%</td></tr><tr><td></td><td>•Hb/platelet •MCV or Hct</td><td><0.8%/<3.3% <0.8% (MCV)</td><td><0.8%/<3.3% <0.8% (MCV)</td></tr><tr><td>Accuracy of automate per NCCLS H-20A</td><td>d diff. compared with manual diff.,</td><td>lymph% = $\pm 1.5\%$, neut% = $\pm 2.0\%$, mono% = $\pm 1.0\%$, eos% = $\pm 0.5\%$, baso% = $\pm 0.5\%$</td><td>lymph%= $\pm 1.5\%$, neut%= $\pm 2.0\%$, mono%= $\pm 1.0\%$, eos%= $\pm 0.5\%$, baso%= $\pm 0.5\%$</td></tr><tr><td>Interfering substances</td><td>:•WBC</td><td>unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle</td><td>unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed pa</td></tr><tr><td></td><td>•RBC</td><td>>35 fL, large Plt very high WBC, high conc. large Plt, autoagglutinins</td><td>>35 fL, large Plt very high WBC, high conc. large Plt, autoagglutinins</td></tr><tr><td></td><td>•MCV or Hct •Platelet</td><td>very high WBC, high conc. large Plt, autoagglutinins very small RBCs & WBC frags. may interfere</td><td>MCV & Hct: very high WBC, high conc. large Plt, autoagglutinins very small RBCs & WBC frags. may interfere</td></tr><tr><td>Interfering substances</td><td>•Hb • differential</td><td>very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs high triglycerides may affect lysing</td><td>very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs high triglycerides may affect lysing</td></tr><tr><td>Age- and sex-specific</td><td></td><td>yes</td><td>yes</td></tr><tr><td>Max. CBCs per hr/max</td><td>-</td><td>105 per analyzer on automation system/105 per analyzer on automation sys.</td><td>105/105</td></tr><tr><td>Recommended avg. fre</td><td></td><td>twice per year</td><td>2 times per yr</td></tr><tr><td></td><td>parameters calibrated</td><td>primary/RBC, WBC, Hgb, MCV, Plt, MPV</td><td>primary/RBC, WBC, Hb, MCV, Plt, MPV</td></tr><tr><td>Frequency of blood/lat</td><td></td><td>per CLIA, CAP, JCAHO, state or lab SOP/once per day</td><td>per CLIA, CAP, JCAHO, state or lab SOP/once per day</td></tr><tr><td></td><td>en/closed/sample dead vol. closed</td><td>200 μL/300 μL, 550 μL with slidemaker/1.0 mL</td><td>200 µL/300 µL, 550 µL with slidemaker/1.0 mL</td></tr><tr><td>Tube sampling suppor</td><td>leu</td><td>yes</td><td>yes (multiple sizes & styles)</td></tr><tr><td>Veterinary capability Microsample capabilit</td><td>v</td><td>no yes</td><td>no ves</td></tr><tr><td></td><td>y slides automatically or flags</td><td>yes yes</td><td>yes yes, both</td></tr><tr><td>problems for slide p</td><td></td><td>>350 U.S./\$110.000</td><td>>350 U.S./\$110,000</td></tr><tr><td>Archives patient data</td><td>· ·</td><td>yes</td><td>yes</td></tr><tr><td>Patient-specific archiv</td><td>•</td><td>yes</td><td>yes</td></tr><tr><td>Max. archived data ac</td><td>cessible when system online</td><td>20,000</td><td>20,000 samples</td></tr><tr><td></td><td>meric results–No. specimens</td><td>20,000</td><td>20,000</td></tr><tr><td></td><td>to/cytograms-No. specimens</td><td>5,000</td><td>5,000</td></tr><tr><td> Stored in conjuncti </td><td></td><td>yes</td><td>yes</td></tr><tr><td></td><td>ages & CBC data printed as 1 report</td><td>yes</td><td>yes</td></tr><tr><td></td><td>ecalled and retransmitted ed for reprocessing or report transmission</td><td>yes ves</td><td>yes ves</td></tr><tr><td>Saved data can be sort Performs delta checks</td><td></td><td>-</td><td>yes yes</td></tr><tr><td></td><td></td><td>yes yes</td><td>yes</td></tr><tr><td></td><td>or holding samples are defined by</td><td>user or vendor</td><td>user or vendor</td></tr><tr><td></td><td>ansmitted to LIS while others held</td><td>yes</td><td>yes</td></tr><tr><td>Scattergram display: c</td><td></td><td>yes</td><td>yes</td></tr><tr><td></td><td></td><td>yes</td><td>yes</td></tr><tr><td>Histogram display: col</td><td></td><td>yes</td><td></td></tr><tr><td>Histogram display: col</td><td>or with threshhold imen &/or result info. displayed</td><td>yes</td><td>yes</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s</td><td>imen &/or result info. displayed</td><td>yes RS-232</td><td>RS-232, proprietary</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre</td><td>imen &/or result info. displayed supported d on LIS interface</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt</td><td>imen &/or result info. displayed supported d on LIS interface ed with results</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt How labs get LOINC co</td><td>imen &/or result info. displayed supported d on LIS interface ed with results ides for reagent kits</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no —</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt</td><td>imen &/or result info. displayed supported d on LIS interface ed with results ides for reagent kits</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, extensive decision rules delta checking, patient results & graphics, centralized management of all</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features</td><td>simen &/or result info. displayed supported d on LIS interface ed with results ides for reagent kits r collation system</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no yes, Orchard Software Aqueduct enhanced QC, data archiving, data colleciton from multiple instruments, extensive decision rules, delta checking, patient results & graphics</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, extensive decision rules delta checking, patient results & graphics, centralized management of all instruments</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features Interface avail. or plan Bar-code symbologies</td><td>imen &/or result info. displayed supported d on LIS interface ed with results vides for reagent kits r collation system ned to auto. specimen-handling system read on tube</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no — yes, Orchard Software Aqueduct enhanced QC, data archiving, data colleciton from multiple instruments, extensive decision rules, delta checking, patient results & graphics Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, extensive decision rules delta checking, patient results & graphics, centralized management of all instruments Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features Interface avail. or plan Bar-code symbologies Accommodates bar-co</td><td>imen &/or result info. displayed supported d on LIS interface ed with results ides for reagent kits r collation system ned to auto. specimen-handling system read on tube de placement per NCCLS standard Auto2A</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; 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patient demographics, patient orders, LIS to instrument—broadcast no </td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, extensive decision rules delta checking, patient results & graphics, centralized management of all instruments Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7 yes daily: 0; weekly: 0; m onthly: 2 min yes yes/no</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features Interface avail. or plan Bar-code symbologies Accommodates bar-coo Time required for mair Onboard maintenance Time from communica Onboard diagnostics/II Mftr. can perform diag</td><td>eimen &/or result info. displayed supported d on LIS interface ed with results udes for reagent kits r collation system ned to auto. specimen-handling system read on tube de placement per NCCLS standard Auto2A itenance by lab personnel records tion of problem to engineer on site imited to software problems</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no yes, Orchard Software Aqueduct enhanced QC, data archiving, data colleciton from multiple instruments, extensive decision rules, delta checking, patient results & graphics Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7 yes daily: automation system= 5 min, analyzer=0; weekly; automation=10 min, analyzer=0; monthly: automation=15 min, analyzer=2 min yes —</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, extensive decision rules delta checking, patient results & graphics, centralized management of all instruments Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7 yes daily: 0; weekly: 0; m onthly: 2 min</td></tr><tr><td>Histogram display: col Choice of desired spec LIS interface formats s Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features Interface avail. or plan Bar-code symbologies Accommodates bar-coo Time required for mair Onboard maintenance Time from communica Onboard diagnostics/II Mftr. can perform diag</td><td>eimen &/or result info. displayed supported d on LIS interface ed with results ides for reagent kits r collation system ned to auto. specimen-handling system read on tube de placement per NCCLS standard Auto2A intenance by lab personnel records tion of problem to engineer on site imited to software problems inostics via modem ased on cost-per-reportable result</td><td>yes RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no yes, Orchard Software Aqueduct enhanced QC, data archiving, data colleciton from multiple instruments, extensive decision rules, delta checking, patient results & graphics Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7 yes daily: automation system= 5 min, analyzer=0; weekly; automation=10 min, analyzer=0; monthly: automation=15 min, analyzer=2 min yes/no yes/no</td><td>RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patie demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, extensive decision rules delta checking, patient results & graphics, centralized management of all instruments Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7 yes daily: 0; weekly: 0; m onthly: 2 min yes yes/no yes</td></tr></tbody></table>	

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December 2004

High-volume hematology analyzers

Part 5 of 11		Beckman Coulter Inc. Martha M. Diaz/Cellular Analysis Marketing mmdiaz@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000	Beckman Coulter Inc. Martha M. Diaz/Cellular Analysis Marketing mmdiaz@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000
See related article, pa	age 22	714-993-8847 www.beckmancoulter.com	714-993-8847 www.beckmancoulter.com
	led in U.S./outside U.S. U.S./outside U.S./list price	Coulter LH 500 2003/2003 >200/0/\$145,000	Coulter HmX 1999 HmX AL, 1999 HmX CP >400/>600/\$135.000 AL: \$120.000 CP
Test menu:	•Chartable	standard menu (left) plus: retic #, retic %, MRV, IRF, RDW, MPV	standard menu (left) plus: RDW, MPV, retic #&%, graded RBC morph., IRF,
All instruments have:	•Laboratory	_	_
WBC, RBC, Hb, Hct, MC MCH, MCHC, Plt, %&# neu mono, lymph, eos, baso	v, ^{t,} ∙Flags	user-definable age-, gender- &/or location-based ref. intervals, action & critical	comprehensive high/low, definitive & suspect messages
	t not olinically roloacod	limits; user-def. RBC morph.; gradient msgs.	8080
	t not clinically released It submitted for clearance	none	none none
Tests in development For research use only		none PCT, PDW	none PCT, PDW
Tests unique to analy		none	none
Differential method(s) used	Coulter's 3-D biophysical flow cytometry with AccuGate 500, Reaction	Coulter's 3-D VCS technology
Linearity:	•WBC count (10 ⁹ /L)/RBC count (10 ¹² /L)	Manager technologies 0-200/0-8.0	0-99.9/0-7.0
Linearity.	•Hemoglobin (g/dL)/platelet (109/L)	0-25/0-2,000	0-25/0-999
Precision:	•MCV (fL) or Hct (%) •WBC count/RBC count	50–150 (MCV) 2 .5%/2 .0%	50–150 (MCV) <2.5%/<2.0%
Frecision:	•Hb/platelet	2.3%2.0% 1.5%/5.0%	<2.3%/<2.0% <1.5%/<5.0%
	•MCV or Hct	2 % (MCV)	<2.0% (MCV)
-	ed diff. compared with manual diff.,	lymph= ± 1.5 % mean diff.; mono= ± 1.5 % mean diff.; neut= ± 2.0 % mean	lymph%= \pm 3.0%, mono%= \pm 2.0%, neut%= \pm 3.0%, eos%= \pm 1.0%,
per NCCLS H-20A Interfering substance	s:•WBC	diff.; baso= ± 0.5 % mean diff.; eos= ± 0.5 % mean diff. none	baso%=±1.0% unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed pa
			>35 fL, large Plt
	•RBC •MCV or Hct	none	very high WBC, high conc. of very large Plt, autoagglutinins MCV & Hct: very high WBC, high conc. of large Plt, autoagglutinins
	•Platelet	none	very small RBCs & WBC frags. may cause no fit
	•Hb	none	very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs
Interfering substance	s: differential	not designated	high triglycerides may affect lysing
Age- and sex-specific	÷	yes	gender-specific printout
Max. CBCs per hr/ma Recommended avg. f	x. CBCs & diffs. per hr requency of calib	75/75 timing not specified	75/75 timing not specified
-	/parameters calibrated	primary/RBC, WBC, Hb, MCV, Plt, MPV	primary/RBC, WBC, Hb, MCV, Plt, MPV
Frequency of blood/la	itex controls pen/closed/sample dead vol. closed	not specified/once per day 125 µL/185 µL/tube dependent	not specified/once per day 125 µL/185 µL/50 µL predilute/0.5 mL
Tube sampling suppo		yes (10.25 x 75 mm or less; 13 x 75 mm or less)	yes (multiple sizes & styles)
Veterinary capability Microsample capabili	tv	no yes	no ves
Prepares microscopic	slides automatically or flags	no	yes no
problems for slide If auto. slidemaker av	prep vailable, No. installed/list price	_	n/a
Archives patient data	for later comparison	yes	yes
Patient-specific archi	-	yes na nan	yes
	ccessible when system online umeric results–No. specimens	20,000 20,000	5,000 samples 5,000
Memory capacity—hi	sto/cytograms-No. specimens	5,000	5,000
 Stored in conjunc Histo/cytogram in 	tion with CBC data nages & CBC data printed as 1 report	yes yes	yes yes
Saved results can be	recalled and retransmitted	yes	yes
Saved data can be sor Performs delta check	ted for reprocessing or report transmission s	yes yes	yes no
Tags and holds result	ts for followup, confirm. testing, or rerun	-	yes
	for holding samples are defined by transmitted to LIS while others held	user	user or vendor
Some results can be Scattergram display:	transmitted to LIS while others held cell-specific color	yes yes	yes, through a selective batch process 4 colors/cell types
Histogram display: co	lor with threshhold	yes	colors without thresholds
choice of desired spe	cimen &/or result info. displayed	yes	no
LIS interface formats Information transferre		RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient	RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; pati demographics, orders, LIS to instrument - brockent
LOINC codes transmit	tted with results	demographics, orders, LIS to instrument—broadcast no	demographics, orders, LIS to instrument—broadcast no
How labs get LOINC c	-	technical support	technical support
Optional data mgmt. • Software features		yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, data collation from multiple instruments, common database, extensive decision rules, delta checking, patient results & graphics, centralized management of instruments	yes, DL 2000, Orchard Software Aqueduct enhanced QC, data archiving, common database, delta checking, patient results & graphics
•	nned to auto. specimen-handling system	_	Beckman Coulter
Bar-code symbologie Accommodates bar-co	s read on tube ode placement per NCCLS standard Auto2A	Codabar, codes 39 & 128, ASTM, interl. 2 of 5, NW7 yes	Codabar, codes 39 & 128, interl. 2 of 5, NW7 no
Time required for mail	intenance by lab personnel e records	none yes	none no
Time from communic	ation of problem to engineer on site	<u> </u>	-
	limited to software problems gnostics via modem	yes/no yes	yes/no no
Onboard diagnostics/ Mftr. can perform dia			
Mftr. can perform dia	based on cost-per-reportable result	yes	yes

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High-volume hematology analyzers

Part 6 of 11			
		Beckman Coulter Inc.	Horiba ABX Diagnostics Inc.
		Martha M. Diaz/Cellular Analysis Marketing mmdiaz@beckman.com 200 S. Kraemer Blvd.	Tom Brown tbrown@us.abx.fr 34 Bunsen
		Brea, CA 92822-8000	Irvine, CA 92618
		714-993-8847	888-903-5001 ext. 535
See related article, pa	ige 22	www.beckmancoulter.com	www.abx.com
Name of instrument		Coulter Ac•T 5diff Family; Ac•T 5diff AL	Pentra 60C+ Hematology Analyzer
•	ed in U.S./outside U.S.	2001/2000; 2003/2003	2000/2000
No. units installed in l	U.S./outside U.S./list price	400/600/\$43,500 cap pierce model; \$38,500 open vial model; AL: 30/; \$54,500 autoloader	286/400/\$49,500
Test menu:	•Chartable	standard menu (left) plus: RDW, MPV	standard menu (left) plus: RDW, MPV
All instruments have:			stanuaru menu (ieri) pius. no w, wir v
WBC, RBC, Hb, Hct, MC\ MCH, MCHC, Plt, %&# neu		atyp. lymph. # (ATL#), atyp. lymph % (ATL%), immature cells # (IMM#),	atyp. lymph, atyp. lymph %, LIC, LIC %
mono, lymph, eos, baso	•Flags	immature cells % (IMM%), PCT, PDW complete operator selectable flagging	operator selectable flagging
	-		
	t not clinically released It submitted for clearance	none	none
Tests in development		none	none none
For research use only	,	PCT, PDW, IMM, ATL	none
Tests unique to analy	zer	none	none
Differential method(s)	used	AcV technology combining cytochemistry, focused flow impedance, and light	DHSS technology combining cytochemistry, focused flow impedance, &
l incority:	sWPC count (109/1)/PPC (4010/1)	absorbance prinicples of measurement	absorbance principles of measurement
Linearity:	•WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) •Hemoglobin (g/dL)/platelet (10 ⁹ /L)	0.4–91.3/0.3–8.0*; AL: 0.4–120.0/0.3–8.0 0–22/10–1,000*; AL: 1.3–24.0/10.0–1,000	0–120/0–8 0.7–24/0–1,900
	•MCV (fL) or Hct (%)	1.8–63.8 (Hct)*	0.7–67% (Hct)
Precision:	•WBC count/RBC count	<2%/<2%	<2%/<2%
	•Hb/platelet	<1%/<5%	<1%/<5%
	•MCV or Hct	<1.0% (Hct); AL: <2.0% (Hct)	<2% (Hct)
Accuracy of automate	ed diff. compared with manual diff.,	not available in NCCLS H-20A format	neut% = 0.99, lymph% = 0.98, mono% = 0.96, eos% = 0.89,
per NCCLS H-20A		NDDCo Ditalumno lower Ditaluce mainte i DDC	baso% = 0.54
Interfering substance	5.• WDG	NRBCs, Plt clumps, large Plts, lyse-resistant RBCs	NRBCs, Plt clumps, lyse-resistant RBCs
	•RBC	cold agglutinins, Plt clumps, WBC overlinearity	cold agglutinins
	•MCV or Hct	Hct: lipemic samples, high WBC, cold aggluts	Hct: extreme leukocytosis
	•Platelet	RBC and WBC fragments	microcytes, Pit clumps
	•Hb	elevated WBC, lipemia	extreme lipemia/leukocytosis
Interfering substance	s: differential	lyse-resistant RBCs, NRBCs, lipemia	NRBC, lyse-resistant RBCs, extreme hyperbilirubinemia
Age- and sex-specific	reference ranges	yes	yes
•	x. CBCs & diffs. per hr	60/60; 80/80	60/60
Recommended average	ge frequency of calib. //parameters calibrated	not specified by time open or closed/RBC, WBC, Hb, Hct, Plt	6 months closed-open/WBC, RBC, Hb, Hct, Plt, MPV
Frequency of blood/la	-	not specified/none	per CLIA standards/none
• •	en/closed/sample dead vol. closed	30 μL for CBC/30 μL/varies by tube size;	53 μL/53 μL/0.5 mL
		53 μL for CBC-diff/53 μL for CBC-diff./varies by tube size	
Tube sampling suppo	rted	yes (multiple sizes)	yes (multiple sizes)
Veterinary capability Microsample capabili	ty	no yes	yes yes
	slides automatically or flags	no	no
problems for slide p	-		
If auto. slidemaker av	ailable, No. installed/list price	n/a	-
Archives patient data	-	yes	yes
Patient-specific archi	-	NO 10 000 complete	yes, with Hemalink Data Manager
	ccessible when system online umeric results–No. specimens	10,000 samples 10,000	unlimited with Hemalink Data Manager 10,000, unlimited with Hemalink Data Manager
Memory canacity—ni		10,000	10,000, unlimited with Hemalink Data Manager
	sto/cytograms–No. specimens		
Memory capacity—hi •Stored in conjunct	sto/cytograms–No. specimens tion with CBC data	yes	yes
Memory capacity—hi •Stored in conjunct •Histo/cytogram in	sto/cytograms–No. specimens tion with CBC data 1ages & CBC data printed as 1 report	yes	yes yes
Memory capacity—hi •Stored in conjunct •Histo/cytogram in Saved results can be	sto/cytograms–No. specimens tion with CBC data nages & CBC data printed as 1 report recalled and retransmitted	yes yes	yes yes yes
Memory capacity—hi •Stored in conjunct •Histo/cytogram in Saved results can be Saved data can be sor	sto/cytograms–No. specimens tion with CBC data nages & CBC data printed as 1 report recalled and retransmitted ted for reprocessing or report transmission	yes yes	yes yes yes yes
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Memory capacity—hi •Stored in conjunct •Histo/cytogram in Saved results can be Saved data can be sor Performs delta checkk Tags and holds result Parameters for flags 1	sto/cytograms-No. specimens tion with CBC data nages & CBC data printed as 1 report recalled and retransmitted ted for reprocessing or report transmission s s for followup, confirm. testing, or rerun for holding samples are defined by	yes yes yes no yes user or vendor	yes yes yes yes yes
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Memory capacity—hi •Stored in conjunct •Histo/cytogram in Saved results can be Saved data can be sor Performs delta check Tags and holds result Parameters for flags I Some results can be to Scattergram display: co Choice of desired spe LIS interface formats Information transferre LOINC codes transmit How labs get LOINC co Optional data mgmt. of • Software features Interface avail. or plant Bar-code symbologies Accommodates bar-cc Time required for main Onboard maintenance Ime from communic Onboard diagnostics/	sto/cytograms-No. specimens tion with CBC data nages & CBC data printed as 1 report recalled and retransmitted ted for reprocessing or report transmission s is for followup, confirm. testing, or rerun for holding samples are defined by transmitted to LIS while others held cell-specific color lor with threshhold cimen &/or result info. displayed supported ed on LIS interface ted with results odes for reagent kits or collation system s read on tube ode placement per NCCLS standard Auto2A intenance by lab personnel e records ation of problem to engineer on site limited to software problems	yes yes yes yes no yes user or vendor yes, through user-defined criteria no yes yes proprietary; proprietary ASTM numeric & flag results, histograms & diff. plots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, optional data mgmt., extensive decision rules, delta checking, patient results & graphics available, centralized management of all instruments no Codabar, codes 39 & 128, interl. 2 of 5, EAN 8 & 13 yes no pes, no	yes yes yes yes yes yes yes yes
Memory capacity—hi •Stored in conjunct •Histo/cytogram in Saved results can be Saved data can be sor Performs delta check Tags and holds result Parameters for flags I Some results can be to Scattergram display: co Choice of desired spe LIS interface formats Information transferre LOINC codes transmit How labs get LOINC c Optional data mgmt. o • Software features Interface avail. or plan Bar-code symbologies Accommodates bar-cc Time required for main Onboard maintenance Ime from communic Onboard diagnostics/	sto/cytograms-No. specimens tion with CBC data nages & CBC data printed as 1 report recalled and retransmitted ted for reprocessing or report transmission s is for followup, confirm. testing, or rerun for holding samples are defined by transmitted to LIS while others held cell-specific color lor with threshhold cimen &/or result info. displayed supported ed on LIS interface ted with results odes for reagent kits or collation system s read on tube ode placement per NCCLS standard Auto2A intenance by lab personnel e records ation of problem to engineer on site limited to software problems	yes yes yes yes no yes user or vendor yes, through user-defined criteria no yes yes proprietary; proprietary ASTM numeric & flag results, histograms & diff. plots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL 2000, Command Central, Orchard Software Aqueduct enhanced QC, data archiving, common database, optional data mgmt., extensive decision rules, delta checking, patient results & graphics available, centralized management of all instruments no Codabar, codes 39 & 128, interl. 2 of 5, EAN 8 & 13 yes	yes yes yes yes yes yes yes yes yes yes
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December 2004

High-volume hematology analyzers

		Horiba ABX Diagnostics Inc.	Horiba ABX Diagnostics Inc.
Part 7 of 11		Tom Brown tbrown@us.abx.fr	Tom Brown tbrown@us.abx.fr
		34 Bunsen	34 Bunsen
		Irvine, CA 92618	Irvine, CA 92618
		888-903-5001 ext. 535	888-903-5001 ext. 535
See related article, pa	ge 22	www.abx.com	www.abx.com
Name of instrument		Pentra 120 Retic Hematology Analyzer	Pentra 80
First year sold-installe	ed in U.S./outside U.S.	1999/1997	2003/2002
No. units installed in U	I.S./outside U.S./list price	89/650/\$125,000	98/300/\$70,000
Test menu:	•Chartable	standard menu (left) plus: RDW, IRF, MPV	standard menu (left) plus: RDW, MPV
All instruments have:			
WBC, RBC, Hb, Hct, MCV		LIC#, LIC%, atyp lymph #&%, CRC%, RETL%, RETM%, RETH%, IMR%, MRV,	atyp. lymph, atyp. lymph%, LIC, LIC%
MCH, MCHC, Plt, %&# neut mono, lymph, eos, baso	·	MFI%	an and a stable flaming
	•Flags	operator selectable flagging	operator selectable flagging
FDA-cleared tests but	not clinically released	none	none
Tests not available bu	t submitted for clearance	none	none
Tests in development		none	none
For research use only		none	none
Tests unique to analyz	er	-	none
Differential method(s)	used	cytochemistry, focused flow impedance, light absorbance	DHSS technology combining cytochemistry, focused flow impedance & li
		·····	absorbance principles of measurement
Linearity:	•WBC count (10 ⁹ /L)/RBC count (10 ¹² /L)	0–150/0.5–8.1	0–120/0–8
	•Hemoglobin (g/dL)/platelet (10 ⁹ /L)	2-25/0-2,000	1.3–24/0–1,900 (>2 g/dL Hgb)
Provision	•MCV (fL) or Hct (%)	0–80 (Hct)	2–67% (Hct)/0–2,800 (<2 g/dL Hgb)
Precision:	•WBC count/RBC count •Hb/platelet	<2%/<2% <1%/<5%	<2%/<2% <1%/<5%
	•MCV or Hct	<1%/<5% <2% (Hct)	<1%/<5% <2% (Hct)
Accuracy of automate	d diff. compared with manual diff.,	neut% =0.99, lymph% =0.99, mono% =0.92, eos% =0.97, baso% =0.71	neut% =0.99, lymph% =0.99, mono% =0.36, eos% =0.61
per NCCLS H-20A			
Interfering substances	s:•WBC	NRBCs, Plt clumps/lyse-resistant RBCs	NRBCs, Plt clumps, lyse-resistant RBCs
	•RRC	cold addutining	cold andutining
	•RBC	cold agglutinins	cold agglutinins
	•MCV or Hct	Hct: extreme leukocytosis	Hct: extreme leukocytosis
	•Platelet	microcytes, Plt clumps	microcytes, Plt clumps
	•Hb	extreme lipemia/leukocytosis	extreme lipemia, leukocytosis
Interfering substances	: differential	NRBCs, lyse-resistant RBCs, extreme hyperbilirubinemia	NRBCs, lyse-resistant RBCs, extreme hyperbilirubinem ia
A			
Age- and sex-specific Max. CBCs per hr/max		yes 120/120	yes 80/80
Recommended averag	•	6 months	6 months
-	parameters calibrated	closed, open/WBC, RBC, Hb, Hct, Plt	closed rack/WBC, RBC, Hb, Hct, Plt, MPV
Frequency of blood/lat	tex controls	per CLIA standards/not required	per CLIA standards/none
Frequency of blood/lat	tex controls en/closed/sample dead vol. closed	per CLIA standards/not required 130 μL/200 μL/1 mL	per CLIA standards/none 53 μL/53 μL/0.5 mL
Frequency of blood/lat Min. specimen vol. op Tube sampling suppor	en/closed/sample dead vol. closed		•
Frequency of blood/lat Min. specimen vol. op Tube sampling suppor Veterinary capability	en/closed/sample dead vol. closed ted	130 µL/200 µL/1 mL yes yes	⁵ 3 µL/03 µL/0.5 mL yes no
Frequency of blood/lat Min. specimen vol. op Tube sampling suppor Veterinary capability Microsample capabilit	en/closed/sample dead vol. closed ted y	130 µL/200 µL/1 mL yes yes yes	53 μL/53 μL/0.5 mL yes no yes
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December 2004

High-volume hematology analyzers

		Horiba ABX Diagnostics Inc.	Horiba ABX Diagnostics Inc.
Part 8 of 11		Tom Brown tbrown@us.abx.fr	Tom Brown tbrown@us.abx.fr
		34 Bunsen	34 Bunsen
		Irvine, CA 92618	Irvine, CA 92618
.		888-903-5001 ext. 535	888-903-5001 ext. 535
See related article, pag	e 22	www.abx.com	www.abx.com
Name of instrument		Pentra XL 80	Pentra DX120/FDA SUBMISSION PENDING
First year sold-installe	d in U.S./outside U.S.	2004/2003	—/2004
No. units installed in U	.S./outside U.S./list price	8/80/\$90,000	0/25/—
Toot monu	- Chortable	standard many (left) plus automatic dilution of sugrange results (MDC v 2	standard many (left) plus, NDDCs, ratioulogytes, IDC
Test menu:	Chartable	standard menu (left) plus: automatic dilution of overrange results (WBC x 3, RBC/hgb/Plt x 2), RDW, MPV	standard menu (left) plus: NRBCs, reticulocytes, IRF
All instruments have:	•Laboratory	atyp. lymph, atyp. lymph%, LIC, LIC%	LIC%&#, atyp lymphs %&#, IMG %&#, IML %&#, IMM %&#, RETL%, RET</td></tr><tr><td>WBC, BBC, Hh, Hct, MCV,</td><td>•</td><td></td><td>RETH%, IMR%, MRU, MFI%, CRC%</td></tr><tr><td>MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso</td><td>•Flags</td><td>operator selectable flagging</td><td>-</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>FDA-cleared tests but I</td><td>not clinically released</td><td>none</td><td>pending 510(k)</td></tr><tr><td></td><td>submitted for clearance</td><td>none</td><td>pending 510(k)</td></tr><tr><td>Tests in development</td><td></td><td>_</td><td>pending 510(k)</td></tr><tr><td>For research use only</td><td></td><td>none</td><td>-</td></tr><tr><td>Tests unique to analyze</td><td>ər</td><td>automatic dilution protocol</td><td>-</td></tr><tr><td>Differential method(s)</td><td>ucod</td><td>DHSS technology combining cytochemistry, focused flow impedance & light</td><td>cytochemistry (chlorazolic black) and absorbance</td></tr><tr><td>Differential method(s)</td><td>1560</td><td>absorbance</td><td>Cytochemistry (chiorazone black) and absorbance</td></tr><tr><td>Linearity:</td><td>•WBC count (10⁹/L)/RBC count (10¹²/L)</td><td>0-120/0-8</td><td>0–150/0.5–8.1</td></tr><tr><td>-</td><td>•Hemoglobin (g/dL)/platelet (10⁹/L)</td><td>0-24/0-1,900 (>2 g/dL Hgb)</td><td>2–25/0–2,000</td></tr><tr><td></td><td>•MCV (fL) or Hct (%)</td><td>0–67% (Hct)/0–2,800 (<2 g/dL Hgb)</td><td>0–80 (Hct)</td></tr><tr><td></td><td>•WBC count/RBC count</td><td><2%/<2%</td><td><2%/<2%</td></tr><tr><td></td><td>•Hb/platelet</td><td><1%/<5%</td><td><1%/<5%</td></tr><tr><td></td><td> MCV or Hct I diff. compared with manual diff., </td><td><2% (Hct) neut% =0.99, lymph% =0.98, mono% =0.96, eos% =0.89,</td><td><2% (Hct) neut%=0.99, lymph% =0.98, mono% =0.92, eos% =0.97,</td></tr><tr><td>per NCCLS H-20A</td><td>ann oomparoa with manual unit,</td><td>baso%=0.54</td><td>heat%=0.99, lympin% =0.98, mono% =0.92, e05% =0.97, baso%=0.71</td></tr><tr><td>Interfering substances:</td><td>•WBC</td><td>NRBCs, Plt clumps, lyse-resistant RBCs</td><td>NRBCs, Plt clumps, lyse-resistant RBCs</td></tr><tr><td>-</td><td></td><td></td><td></td></tr><tr><td></td><td>•RBC</td><td>cold agglutinins</td><td>cold agglutinins</td></tr><tr><td></td><td>•MCV or Het</td><td>Hot avtrama laukocutosis</td><td>Het: avtrame lauk ocutorie</td></tr><tr><td></td><td>•MCV or Hct</td><td>Hct: extreme leukocytosis</td><td>Hct: extreme leukocytosis</td></tr><tr><td></td><td>•Platelet</td><td>microcytes, Plt clumps</td><td>microcytes, Plt clumps</td></tr><tr><td></td><td>•Hb</td><td>extreme lipemia, leukocytosis</td><td>extreme lipemia, leukocytosis</td></tr><tr><td>Interfering substances:</td><td>differential</td><td>NRBCs, lyse-resistant RBCs, extreme hyperbilirubinemia</td><td>NRBCs, lyse-resistant RBCs, extreme hyperbilirubinem ia</td></tr><tr><td>Age- and sex-specific</td><td>reference ranges</td><td>yes</td><td>yes</td></tr><tr><td>Max. CBCs per hr/max.</td><td></td><td>80/80</td><td>120/120</td></tr><tr><td>Recommended average</td><td>-</td><td>6 months</td><td>6 months</td></tr><tr><td> Modes calibrated/ </td><td>parameters calibrated</td><td>open, closed/WBC, RBC, Hb, Hct, Plt, MPV</td><td>open, closed/WBC, RBC, Hb, Hct, Plt, MPV</td></tr><tr><td>Frequency of blood/late</td><td></td><td>per CLIA standards/none</td><td>per CLIA standards/none</td></tr><tr><td>Min. specimen vol. ope</td><td>n/closed/sample dead vol. closed</td><td>30 for CBC/53 for CBC & diff/0.5 mL</td><td>130 µL/200 µL/1 mL</td></tr><tr><td>Tube sampling support</td><td>ed</td><td>yes (autoloader 13 x 75; closed tube 16 sizes + micro)</td><td>yes</td></tr><tr><td>Veterinary capability</td><td>54</td><td>yes</td><td>no</td></tr><tr><td>Microsample capability</td><td>1</td><td>yes</td><td>no</td></tr><tr><td>Prepares microscopic s</td><td>slides automatically or flags</td><td>yes</td><td>yes</td></tr><tr><td>problems for slide pr</td><td></td><td></td><td></td></tr><tr><td>it auto. sildemaker ava</td><td>ilable, No. installed/list price</td><td>—/—</td><td>—/—</td></tr><tr><td>Archives patient data f</td><td>or later comparison</td><td>yes</td><td>yes</td></tr><tr><td>Patient-specific archivi</td><td>•</td><td>yes, with Hemalink Data Manager</td><td>yes</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>•</td><td>cessible when system online</td><td>unlimited with Hemalink Data Manager; 10,000 instrument only</td><td>unlimited Data Manager; 10,000 instrument only</td></tr><tr><td>Max. archived data acc</td><td>•</td><td>unlimited with Hemalink Data Manager; 10,000 instrument only</td><td>unlimited Data Manager; 10,000 instrument only unlimited Data Manager</td></tr><tr><td>Max. archived data acc Memory capacity—nur Memory capacity—his</td><td>sessible when system online neric results–No. specimens to/cytograms–No. specimens</td><td>unlimited with Hemalink Data Manager; 10,000 instrument only unlimited with Hemalink Data Manager</td><td>unlimited Data Manager; 10,000 instrument only unlimited Data Manager unlimited Data Manager</td></tr><tr><td>Max. archived data acc Memory capacity—nur Memory capacity—his •Stored in conjunction</td><td>cessible when system online neric results–No. specimens to/cytograms–No. specimens on with CBC data</td><td>unlimited with Hemalink Data Manager; 10,000 instrument only unlimited with Hemalink Data Manager yes</td><td>unlimited Data Manager; 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		800-379-7639	800-379-7639
See related article, page 2	2	www.sysmex.com/usa	www.sysmex.com/usa
Name of instrument		Sysmex XE-2100	Sysmex XE-2100L
First year sold–installed in No. units installed in U.S./o		2000 650/2,000/\$225,000	2001 100/300/\$200,000
Test menu: •Ch	nartable	standard menu (left) plus: NRBC %&#, retic %&#*, RDW-SD, RDW-CV, IRF,</td><td>standard menu (left) plus: MPV, RDW-SD, RDW-CV, NRBC %&#,</td></tr><tr><td>All instruments have:</td><td></td><td>Pit-O, HPC#, MPV, IG%, IG#</td><td>IG%, IG#</td></tr><tr><td>WBC, RBC, Hb, Hct, MCV, •La MCH, MCHC, Plt, %&# neut,</td><td>boratory</td><td>none</td><td>none</td></tr><tr><td>mana humb and have</td><td>ags</td><td>Plt clumps, RBC agglut, turbidity, WBC ABN scattergram, RBC ABN distrib.,</td><td>Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast, le</td></tr><tr><td></td><td></td><td>Plt ABN distrib., RBC lyse resistance, blasts, left shift, atyp. lymph., ABN</td><td>atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse</td></tr><tr><td>FDA-cleared tests but not</td><td>clinically released</td><td>lymph./blast., ret. ABN scattergram none</td><td>RBC agglut., turbidity none</td></tr><tr><td>Tests not available but sub</td><td>-</td><td>none</td><td>none</td></tr><tr><td>Tests in development For research use only</td><td></td><td>RET-He, IPF P-LCR, PCT, PDW</td><td>none P-LCR, PCT, PDW</td></tr><tr><td>Tests unique to analyzer</td><td></td><td>NRBC, HPC#, IG%, IG#</td><td>HPC#, NRBC, IG%, IG#</td></tr><tr><td>Differential method(s) use</td><td>d</td><td>fluorescent flow cytometry, RF/DC detecting method</td><td>fluorescent flow cytometry, RF/DC detecting method</td></tr><tr><td>Linearity: •W</td><td>BC count (10⁹/L)/RBC count (10¹²/L)</td><td>0–170/0–8</td><td>0–170/0–8</td></tr><tr><td></td><td>emoglobin (g/dL)/platelet (10º/L) CV (fL) or Hct (%)</td><td>0–25/0–5,000 0–60 (Hct)</td><td>0–25/0–5,000 0–60 (Hct)</td></tr><tr><td></td><td>BC count/RBC count</td><td><3%/<1.5%</td><td>3%/1.5%</td></tr><tr><td></td><td>b/platelet GV or Het</td><td><1.0%/<4.0%</td><td>1.0%/4.0%</td></tr><tr><td>•M</td><td>CV or Hct</td><td><1.0% (Hct)</td><td>1.0 % (Hct)</td></tr><tr><td></td><td>ff. compared with manual diff.,</td><td>neut% R=0.95, lymph% R=0.95, mono% R=0.79, eos% R=0.92,</td><td>neut% R=0.95, lymph% R=0.96, mono% R=0.79, eos% R=0.92,</td></tr><tr><td>per NCCLS H-20A</td><td>PC .</td><td>baso% R=0.82, NRBC% R=0.96, IG% R=0.80</td><td>baso% R=0.82, NRBC% R=0.96, IG% R=0.80</td></tr><tr><td>Interfering substances:•W</td><td></td><td>cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs</td><td>cold agglut., Pit aggreg., cryoglob., lyse-resistant RBCs, NRBCs</td></tr><tr><td>•RE</td><td>3C</td><td>cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis</td><td>cold agglut., severe microcytosis, frag. RBCs, leukocytosis (>10</td></tr><tr><td>•M</td><td>CV or Hct</td><td>Hct: cold agglutinins, leukocytosis (>100,000/µL), ABN red cell fragility, spherocytosis</td><td>Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocyto (>100,000/µL)</td></tr><tr><td></td><td></td><td>spilerocytosis</td><td>(>100,000/µL)</td></tr><tr><td>●PI; ●Ht</td><td>atelet</td><td>pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts lipemia, ABN proteins in blood plasma, severe leukocytosis (>100,000/µL)</td><td>pseudothrombocytopenia, Plt aggreg., incr. microc ytosis, megal lipemia, ABN proteins, leukocytosis (>100,000/µL)</td></tr><tr><td>Interfering substances: dif</td><td></td><td>lyse-resistant RBCs</td><td>lyse-resistant RBCs</td></tr><tr><th>Age- and sex-specific refe</th><th>rence ranges</th><th>yes</th><th>yes</th></tr><tr><td>Max. CBCs per hr/max. CB</td><td>Cs & diffs. per hr</td><td>150/150</td><td>150/150</td></tr><tr><td> Recommended average free Modes calibrated/para </td><td></td><td>twice per year open, closed, capillary/WBC, RBC, Hb, Hct, Plt</td><td>twice per year open, closed, capillary/WBC, RBC, Hb, Hct, Plt</td></tr><tr><td>Frequency of blood/latex of</td><td></td><td>per CLIA requirements/not required</td><td>per CLIA requirements/not required</td></tr><tr><td></td><td>losed/sample dead vol. closed</td><td>130 µL/200 µL/1 mL</td><td>130 μL/200 μL/1 mL</td></tr><tr><td>Tube sampling supported Veterinary capability</td><td></td><td>yes no</td><td>yes no</td></tr><tr><td>Microsample capability</td><td></td><td>yes</td><td>yes</td></tr><tr><td>Prepares microscopic slide</td><td>es automatically or flags</td><td>yes with Alpha or HST upgrade</td><td>yes with Alpha or HST upgrade</td></tr><tr><td>problems for slide prep If auto. slidemaker availab</td><td>le, No. installed/list price</td><td>>1,000</td><td>>1,000</td></tr><tr><td>Archives patient data for la</td><td>ater comparison</td><td>yes</td><td>yes</td></tr><tr><td>Patient-specific archiving</td><td></td><td>yes</td><td>yes</td></tr><tr><td>Max. archived data access Memory capacity—numeri</td><td></td><td>10,000 samples 10,000</td><td>10,000 samples 10,000 samples</td></tr><tr><td>Memory capacity—humen Memory capacity—histo/c</td><td></td><td>10,000</td><td>10,000 samples</td></tr><tr><td> Stored in conjunction v </td><td>with CBC data</td><td>yes</td><td>yes</td></tr><tr><td> Histo/cytogram images Saved results can be recal </td><td>s & CBC data printed as 1 report lled and retransmitted</td><td>yes yes</td><td>yes yes</td></tr><tr><td></td><td>or reprocessing or report transmission</td><td></td><td>yes</td></tr><tr><td>Performs delta checks</td><td>followup confirm toting</td><td>yes</td><td>yes</td></tr><tr><td></td><td>followup, confirm. testing, or rerun olding samples are defined by</td><td>yes user or vendor</td><td>yes user or vendor</td></tr><tr><td>Some results can be trans</td><td>mitted to LIS while others held</td><td>yes</td><td>yes</td></tr><tr><td>Scattergram display: cell-s Histogram display: color w</td><td>-</td><td>yes ves</td><td>yes ves</td></tr><tr><td></td><td>nn threshnold n &/or result info. displayed</td><td>yes yes</td><td>yes yes</td></tr><tr><td>LIS interface formats supp</td><td>orted</td><td>RS-232C/TCP IP</td><td>RS-232C, TCP IP</td></tr><tr><td>Information transferred on</td><td></td><td>numeric & flag results, histograms & scatterplots, instrument to LIS; patient</td><td>numeric & flag results, histograms & scatterplots, instrument to</td></tr><tr><td></td><td></td><td>demographics, orders, LIS to instrument—broadcast; host query for patient</td><td>demographics, orders, LIS to instrument—broadcast; host quer</td></tr><tr><td>LOINC codes transmitted v</td><td>vith results</td><td>demographics & orders —</td><td>demographics & orders —</td></tr><tr><td>How labs get LOINC codes</td><td></td><td>n/a</td><td>n/a</td></tr><tr><td>Optional data mgmt. or col</td><td>lation system</td><td>yes, proprietary</td><td>yes, proprietary</td></tr><tr><td>· Software features</td><td></td><td>enhanced QC, data archiving, data collation from multiple instruments, online QC</td><td>enhanced QC, data archiving, data collation from multiple instru online QC</td></tr><tr><td> Software features </td><td></td><td>Roche, Labotix, IDS, A&T</td><td>Roche, Labotix, A&T, IDS</td></tr><tr><td></td><td>to auto. specimen-handling system</td><td></td><td></td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea</td><td>d on tube</td><td>Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13</td><td>Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea</td><td></td><td></td><td>Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea Accommodates bar-code p Time required for mainten</td><td>d on tube lacement per NCCLS standard Auto2A ance by lab personnel</td><td>yes daily: 15 min walkaway</td><td>yes daily: 15 min walkaway</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea Accommodates bar-code pl Time required for mainten Onboard maintenance reco</td><td>d on tube lacement per NCCLS standard Auto2A ance by lab personnel</td><td>yes</td><td>yes</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea Accommodates bar-code p Time required for mainten Onboard maintenance reco Time from communication Onboard diagnostics/limite</td><td>d on tube lacement per NCCLS standard Auto2A ance by lab personnel ords of problem to engineer on site ed to software problems</td><td>yes daily: 15 min walkaway yes territory dependent yes/no</td><td>yes daily: 15 min walkaway yes territory dependent yes/no</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea Accommodates bar-code p Time required for mainten Onboard maintenance reco Time from communication Onboard diagnostics/limite</td><td>d on tube lacement per NCCLS standard Auto2A ance by lab personnel ords of problem to engineer on site ed to software problems</td><td>yes daily: 15 min walkaway yes territory dependent</td><td>yes daily: 15 min walkaway yes territory dependent</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea Accommodates bar-code pi Time required for mainten Onboard maintenance rec Time from communication Onboard diagnostics/limite Mftr. can perform diagnost</td><td>d on tube lacement per NCCLS standard Auto2A ance by lab personnel ords of problem to engineer on site ed to software problems</td><td>yes daily: 15 min walkaway yes territory dependent yes/no</td><td>yes daily: 15 min walkaway yes territory dependent yes/no</td></tr><tr><td>Interface avail. or planned Bar-code symbologies rea Accommodates bar-code pi Time required for mainten Onboard maintenance rec Time from communication Onboard diagnostics/limite Mftr. can perform diagnos</td><td>d on tube lacement per NCCLS standard Auto2A ance by lab personnel ords of problem to engineer on site ed to software problems tics via modem</td><td>yes daily: 15 min walkaway yes territory dependent yes/no yes</td><td>yes daily: 15 min walkaway yes territory dependent yes/no yes</td></tr></tbody></table>	

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Part 10 of 11		Sysmex America Inc. Barb Connell 1 Nelson C. White Pkwy.	Sysmex America Inc. Nilam Patel 1 Nelson C. White Pkwy.
	-	Mundelein, IL 60060 800-379-7639	Mundelein, IL 60060 800-379-7639
See related article, page	ge 22	www.sysmex.com/usa	www.sysmex.com/usa
Name of instrument First year sold-installe No. units installed in U	ed in U.S./outside U.S. .S./outside U.S./list price	Sysmex XE-2100D 2004/2004 //\$200,000	Sysmex XE-Alpha N/HST-N 2000 >1,000 worldwide/\$360,000–\$1,000,000
Test menu:	•Chartable	standard menu (left) plus: RDW-SD, RDW-CV, IG%, IG#	standard menu (left) plus: NRBC %&#, retic %&#, RDW-SD, Ri Plt-O, HPC#, MPV, IG%, IG#</td></tr><tr><td>All instruments have: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut,</td><td></td><td>none</td><td>none</td></tr><tr><td>mono, lymph, eos, baso</td><td>•Flags</td><td>Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast, left shift, atyp. lymph., ABN lymph./blast, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity</td><td>Pit clumps, RBC agglut., turbidity, WBC ABN scattergram, RB Pit ABN distrib., RBC lyse resistance, blasts, left shift, atyp. I ABN lymph./blast, ret. 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CBCs per hr/max Recommended averag</td><td>-</td><td>150/150 twice per year</td><td>150/150 per analyzer on automation system</td></tr><tr><td>-</td><td>parameters calibrated</td><td>twice per year open, closed, capillary/WBC, RBC, Hb, Hct, Plt</td><td>twice per year open, closed, capillary/WBC, RBC, Hb, Hct, Plt</td></tr><tr><td>Frequency of blood/lat</td><td>ex controls</td><td>per CLIA requirements/not required</td><td>per CLIA requirements/not required</td></tr><tr><td>Min. specimen vol. ope Tube sampling suppor</td><td>en/closed/sample dead vol. closed</td><td>130 μL/200 μL/1 mL yes</td><td>130 μL/200 μL/1 mL yes</td></tr><tr><td>Veterinary capability</td><td></td><td>no</td><td>no</td></tr><tr><td>Microsample capabilit</td><td>-</td><td>yes</td><td>yes</td></tr><tr><td>Prepares microscopic problems for slide p</td><td>slides automatically or flags rep</td><td>yes, with Alpha or HST upgrade</td><td>yes</td></tr><tr><td>lf auto. slidemaker ava</td><td>ilable, No. installed/list price</td><td>>1,000/—</td><td>>1,000/\$250,000</td></tr><tr><td>Archives patient data f</td><td>for later comparison</td><td>yes</td><td>yes</td></tr><tr><td>Patient-specific archiv</td><td>-</td><td>yes</td><td>yes</td></tr><tr><td></td><td>cessible when system online meric results–No. specimens</td><td>10,000 samples 10,000 samples</td><td>10,000 samples 10,000</td></tr><tr><td>Memory capacity—his</td><td>to/cytograms-No. specimens</td><td>10,000</td><td>10,000</td></tr><tr><td>Stored in conjuncti Histo/cytogram im</td><td></td><td>yes ves</td><td>yes ves</td></tr><tr><td></td><td>ages & CBC data printed as 1 report ecalled and retransmitted</td><td>yes yes</td><td>yes yes</td></tr><tr><td>Saved data can be sort</td><td>ed for reprocessing or report transmission</td><td>yes</td><td>yes</td></tr><tr><td>Performs delta checks Tags and holds results</td><td>for followup, confirm. testing, or rerun</td><td>yes ves</td><td>yes yes</td></tr><tr><td>-</td><td>or holding samples are defined 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kits</td><td>n/a ves proprietary</td><td>ves proprietary</td></tr><tr><td>nformation transferre OINC codes transmitt Iow labs get LOINC co</td><td>des for reagent kits</td><td>n/a yes, proprietary enhanced QC, data archiving, data collation from multiple instruments,</td><td>yes, proprietary enhanced QC, data archiving, data collation from multiple in</td></tr><tr><td>Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features</td><td>des for reagent kits r collation system</td><td>yes, proprietary enhanced QC, data archiving, data collation from multiple instruments, online QC</td><td>enhanced QC, data archiving, data collation from multiple in online QC</td></tr><tr><td>Information transferre LOINC codes transmitt How labs get LOINC co Optional data mgmt. o • Software features Interface avail. or plan Bar-code symbologies</td><td>des for reagent kits r collation system ned to auto. specimen-handling system</td><td>yes, proprietary 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main Onboard maintenance Time from communica Onboard diagnostics//ii Mftr. can perform diag</td><td>des for reagent kits r collation system ned to auto. specimen-handling system read on tube de placement per NCCLS standard Auto2A ntenance by lab personnel records tion of problem to engineer on site imited to software problems</td><td>yes, proprietary enhanced QC, data archiving, data collation from multiple instruments, online QC Lab InterLink, MDS/AutoLab, Beckman Coulter, Roche, Labotix, A&T Codabar, codes 39 & 128, ASTM, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes daily: 15 min walkaway yes contract and territory dependent yes/no</td><td>enhanced QC, data archiving, data collation from multiple in online QC Roche, Labotix, IDS, A&T Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes daily: 15 min walkaway yes territory dependent yes/no</td></tr></tbody></table>

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Sysmex America Inc. Sysmex America Inc. Part 11 of 11 Peggy Barranco Peggy Barranco 1 Nelson C. White Pkwy. 1 Nelson C. White Pkwy. Mundelein, IL 60060 Mundelein, IL 60060 800-379-7639 800-379-7639 See related article, page 22 www.sysmex.com/usa www.sysmex.com/usa Name of instrument Sysmex XT-2000i Sysmex XT-1800i First year sold-installed in U.S./outside U.S. 2002 2002 No. units installed in U.S./outside U.S./list price 200/500/\$145.000 150/500/\$125.000 Chartable standard menu (left) plus: retic %&#, IRF, Plt-0, MPV, RDW-SD, RDW-CV standard menu (left) plus: MPV, RDW-SD, RDW-CV Test menu: All instruments have: WBC, RBC, Hb, Hct, MCV, •Laboratory MCH, MCHC, Plt, %&# neut, none none mono, lymph, eos, baso •Flags Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, ret ABN scattergram, NRBC resistance, RBC agglut., turbidity, NRBC none FDA-cleared tests but not clinically released none Tests not available but submitted for clearance none none Tests in development none none IG%&# IG%&# For research use only Tests unique to analyzer Plt-0 Differential method(s) used fluorescent flow cytometry fluorescent flow cytometry •WBC count (10⁹/L)/RBC count (10¹²/L) 0-310/0-8 0-310/0-8 Linearity: •Hemoglobin (g/dL)/platelet (10⁹/L) 0-25/0-2,000 0-25/0-2,000 •MCV (fL) or Hct (%) 0-60 (Hct) 0-60 (Hct) Precision: •WBC count/RBC count 3.0%/1.5% 3.0%/1.5% •Hb/platelet 1.5%/4.0% 1.5%/4.0% •MCV or Hct 1 .5% (Hct) 1.5% (Hct) Accuracy of automated diff. compared with manual diff., neut% R=0.95. lvmph% R=0.96. mono% R=0.90. eos% R=0.94. neut% R=0.95, lymph% R=0.96, mono% R=0.90, eos% R=0.94, per NCCLS H-20A baso% R=0.76 baso% R=0.76 Interfering substances:•WBC cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs •RBC cold agglut., severe microcytosis, frag. RBCs, leukocytosis (>100,000/ μ L) cold agglut., severe microcytosis, frag. RBCs, leukocytosis (>100,000/ μ L) MCV or Hct Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/µL) (>100,000/µL) pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts Platelet pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts •Hb lipemia, ABN proteins, leukocytosis (>100,000/µL) lipemia, ABN proteins, leukocytosis (>100,000/µL) Interfering substances: differential lyse-resistant RBCs lyse-resistant RBCs Age- and sex-specific reference ranges yes yes Max. CBCs per hr/max. CBCs & diffs. per hr 80/80 80/80 Recommended average frequency of calib. every 6 months every 6 months Modes calibrated/parameters calibrated open, closed, capillary/WBC, RBC, Hb, Hct, Plt open, closed, capillary/WBC, RBC, Hb, Hct, Plt Frequency of blood/latex controls per CLIA requirements/not required per CLIA requirements/not required Min. specimen vol. open/closed/sample dead vol. closed 85 µL/150 µL/1 mL 85 uL/150 uL/1 mL Tube sampling supported yes yes Veterinary capability planned for 2005 no **Microsample capability** yes yes Prepares microscopic slides automatically or flags no no problems for slide prep If auto. slidemaker available, No. installed/list price _ Archives patient data for later comparison yes yes Patient-specific archiving ves yes 10,000 samples 10,000 samples Max. archived data accessible when system online Memory capacity-numeric results-No. specimens 10,000 samples 10,000 samples Memory capacity-histo/cytograms-No. specimens 10,000 10,000 •Stored in conjunction with CBC data yes yes •Histo/cytogram images & CBC data printed as 1 report yes yes Saved results can be recalled and retransmitted yes yes Saved data can be sorted for reprocessing or report transmission yes yes Performs delta checks yes yes Tags and holds results for followup, confirm. testing, or rerun yes yes Parameters for flags for holding samples are defined by user or vendor user or vendor Some results can be transmitted to LIS while others held yes yes Scattergram display: cell-specific color yes yes Histogram display: color with threshhold yes yes Choice of desired specimen &/or result info. displayed yes yes LIS interface formats supported RS-232C, TCP IP, ASTM RS-232C, TCP IP, ASTM numeric & flag results, histograms & scatterplots, instrument to LIS; patient Information transferred on LIS interface numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast; host query for patient demographics, orders, LIS to instrument-broadcast; host query for patient

demographics & orders

demographics & orders

	—	—
How labs get LOINC codes for reagent kits	n/a	n/a
Optional data mgmt. or collation system	yes, proprietary	yes, proprietary
Software features	enhanced QC, data archiving, data collation from multiple instruments, online QC	enhanced QC, data archiving, data collation from multiple instruments, online QC
Interface avail. or planned to auto. specimen-handling system	n/a	n/a
Bar-code symbologies read on tube	Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13	Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13
Accommodates bar-code placement per NCCLS standard Auto2A	yes	yes
Time required for maintenance by lab personnel	daily: 15 min walkaway	daily: 15 min walkaway
Onboard maintenance records	yes	yes
Time from communication of problem to engineer on site	contract and territory dependent	contract and territory dependent
Onboard diagnostics/limited to software problems	yes/no	yes/no
Mftr. can perform diagnostics via modem	yes	yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	remote diagnostics; online QC; random access; fluorescent optical platelets; discrete testing; reagent monitoring; customized chartable report formats	remote diagnostics; online QC; random access; discrete testing; reagent monitoring; chartable report formats

Tabulation does not represent an endorsement by the College of American Pathologists

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