

Hematology analyzers

Part 1 of 12	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	CELL-DYN Ruby 2006/2006/— —/—/\$185,000	CELL-DYN Sapphire 2005/2005/— >100/>300/\$250,000
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags FDA-cleared tests but not clinically released Tests not available but submitted for clearance	standard menu (left) plus: MPV, RDW, RETIC %&# #&# for bands, IG, blast, var lymph NRBC, FWBC, NWBC, RRBC, band, IG, blast, variant lymph, RBC morph., DFLT, MCHC, LRI, URI, LURI, ATYPDEP, high/low interp. message, WBC none none	standard menu (left) plus: MPV, RDW, retic %&#, IRF, NRBC %&#, CD61, CD3T %&#, CD4T %&#, CD8T %&#, 4/8 — band, IG, blast, variant lymph, nvWBC, rstRBC, IR, Plt clmp, ASYM, FP, CD61 agg, clot detected during aspiration, short sample none none
Tests in development For research use only Tests unique to analyzer	none none atypical depolarization flag	optical RBC morphology none CD61 for Plts, WVF, CD3/4, CD3/8 (immuno T-cell)
Differential method(s) used Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	MAPSS (Multi-Angle Polarized Scatter Separation) 0.00–246 × 10 ³ /μL/0.00–7.50 × 10 ⁶ /μL 0.00–25.0 g/dL/0.00–3,000 × 10 ³ /μL 58–139 fL: (MCV) 2.4%/1.8% 1.4%/3.8% 0.8% (MCV) neut% r=0.983, slope=0.97, y=-1.98; lymph r=0.921, slope=0.95, y=0.94; mono r=0.711, slope=1.10, y=1.93; eos r=0.952, slope=1.04, y=0.01; baso r=0.146, slope=0.18, y=1.22 fragile WBC, neutrophil aggregates, lytic-resistant RBC, NRBC, Plt clumps, cryofibrinogen, cryoglobulin elevated WBC, increased numbers of giant Plt, auto agglutination, in vitro hemolysis MCV: elevated WBC, hyperglyc., in vitro hemolysis, increased No. of giant Plts WBC fragments, in vitro hemolysis, microcytic RBC, cryofibrinogen, cryoglobulins, Plt clumping, increased No. of giant Plt elevated WBC, increased plasma substances (triglycerides, bilirubin, in vivo hemolysis), lytic-resistant RBC	optical scatter & 3-color fluorescence 0.4–250.0 × 10 ³ μL/ 0.22–7.50 × 10 ⁶ μL 1.0–24.8 g/dL (cyanide free)/11.0–2,000.0 × 10 ³ μL 37.0–179 fL (MCV) ≤2.7%/≤1.5% ≤1.0%/≤4.0% ≤1.0% (MCV) neut% r=0.942 slope 0.947 y=0.446; lym% r=0.936 slope=0.943 y=2.811; mono% r=0.623 slope=1.057 y=0.851; eos% r=0.446 slope=1.024 y=0.288; baso% r=0.232 slope=0.257 y=0.350 Plt clumps, neut aggregates, HbC crystals, lyse-resist. RBCs, cryoglob., cryofibr., frag. WBC, nRBC autoagg., cold agg., elevated WBC, giant Plts, hemolysis, sm WBC MCV: autoagg., cold agg., elevated WBC, giant Plt, hemolysis, hyperglycemia auto & cold agg., cryoglob., cryofibrin., giant Plt, micro RBC, Plt clumps, RBC frag., WBC frag., Plt satellitism lipids>700 mg/dL, WBCs>250 × 10 ⁹ /L, bilirubin>33 mg/dL, Hb crystals
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	fragile WBC, neutrophil aggregates, lytic-resistant RBC, NRBC, Plt clumps, cryofibrinogen, cryoglobulin, paraproteins	see WBC
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes up to 84/up to 84 6 months verification	yes 106/106 6 months verification
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	open or closed/WBC, RBC, Hgb, MCV, Plt per local regulatory requirements/— 150 μL/230 μL/1.2 mL yes (13 × 75 mm) no no no >200/\$125,000	open-closed single procedure/WBC, RBC, Hb, Plt, MPV per regulatory requirement/— 117 μL/117 μL/0.5 mL, 0.3 mL for 10.25 × 64 mm tubes yes (11.5–13 × 65–75 mm, 10.25 × 64 mm, 8.5 × 66 mm [Sarstedt Monovette]) no yes yes (flags only) —/\$125,000
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes
LIS interface formats supported Information transferred on LIS interface	LIS1/LIS2 CLSI numeric & flag results, histograms and scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast; host query for patient demographics and orders	ASTM 1394 numeric & flag results, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast; host query for patient demographics & orders
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	no — yes enhanced QC, data archiving, data collation from multiple instruments	no — yes enhanced QC, data archiving, data collation from multiple instruments, remote viewing
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube	— Codabar, codes 39 & 128, interl. 2 of 5, ISBT	none Codabar, codes 39 & 128, interl. 2 of 5
Accommodates bar-code placement per CLSI standard Auto2A	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 Mfr. can perform diagnostics via modem	daily: 30 sec; weekly: 5 min; monthly: 10 min yes — yes/no yes	daily: 30 sec; weekly: 10 min; monthly: 5 min yes — yes/no no
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	touch-sensitive screen, all optical technology; onboard maintenance videos; lyse-resistant RBC mode; rules-based result annotations	Four optical and three fluorescent detectors providing multiple scatterplot analysis; 2-D optical platelets that avoid interferences; fluorescent analysis of reticulocytes, NRBCs, and three-color monoclonal analysis on a routine hematology analyzer; OpenFlow MAB test selections

Hematology analyzers

Part 2 of 12	Abbott Hematology Karen Semiao karen.semiao@abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 408-567-3384 www.abbottdiagnostics.com	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	CELL-DYN Emerald —/2008/0 0/100/\$30,000	CELL-DYN 3700 1999/1999/— —/—/\$180,000 SL Model, \$140,000 CS Model
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags	WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, lymph %&#, gran %&#, mid %&#, RDW, MPV dispersional data alerts, suspect measurand flags and count invalidation flags	standard menu (left) plus: RDW, MPV, RETIC %&#, IRF band, IG, variant lymph, blast, PCT, PDW, NRBC %&# and retic scatter profile suspect populations, band, blast, variant lymph, IG, NRBC, RRBC, NWBC, LRI, URI, LURI, RBC morph., FWBC, high/low interp. message, WBC
FDA-cleared tests but not clinically released Tests not available but submitted for clearance	none all tests on the CELL-DYN Emerald have been submitted for 510(k) clearance CELL-DYN Emerald is not for sale in the United States	none none
Tests in development For research use only Tests unique to analyzer	none PCT and PDW none	none none IRF
Differential method(s) used Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	impedance counting 0.4–96.1 K/ μ L/0.22–7.61 M/ μ L 3.3–24.6 g/dL/9–1,375 K/ μ L 5.3–75.6% (Hct)/48.8–115 fL (MCV) 3.5% (95% confidence limit)/2.0% (95% confidence limit) 2.1% (95% confidence limit)/6.1% (95% confidence limit) 1.7% Hct (95% confidence limit)/0.8% MCV (95% confidence limit) —/—	MAPSS (Multi-Angle Polarized Scatter Separation) 0–250 K/ μ L/0–8 M/ μ L 0–24 g/dL/0–2,000 K/ μ L 50–200 fL (MCV) \leq 2.5%/ \leq 1.5% \leq 1.2%/ \leq 5.0% \leq 1.0% (MCV) neut %&#: \geq 0.95, —; lymph %&#: \geq 0.94, —; mono %&#: \geq 0.86, —; eos %&#: \geq 0.84, —; baso %&#: \geq 0.73, —
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	cryoglobulin, cryofibrinogen, heparin, monoclonal proteins, nucleated red cells, platelet clumping, unlysed red cells cryoglobulin, cryofibrinogen, giant platelets, high white cell count (>50,000 K/ μ L) cryoglobulin, cryofibrinogen, giant platelets, high white cell count (>50,000 K/ μ L) hyperglycemia (>600 mg/dL) cryoglobulin, cryofibrinogen, hemolysis (in vivo and in vitro), microcytic red cells, red cell inclusions, white cell fragments carboxyhemoglobin (>10%), cryoglobulin, cryofibrinogen, hemolysis (in vivo) heparin, high white cell count (>50,000 K/ μ L), hyperbilirubinemia, lipemia, monoclonal proteins platelet aggregates, NRBCs, giant platelets, cryoglobulins, incomplete lysis of RBC, small lymphocytes, fibrin clots, shift in WBC cell distribution due to EDTA anticoagulant equilibration	NRBCs (WIC only), lytic-resistant RBCs, Plt clumps, cryoglobulin and cryofibrinogen, fragile WBCs increased No. giant Pits, autoagglutination, in vitro hemolysis MCV: elevated WBC count, increased No. giant Pits, hyperglycemia, in vitro hemolysis WBC fragments, in vitro hemolysis, microcytic RBCs, cryoglobulin, Plt clumps, increased No. giant Pits increased plasma substances (triglycerides, bilirubin, in vivo hemolysis), lyse-resistant RBCs
Interfering substances: differential	see WBC	see WBC
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	no 60/60 scheduled calibration of the CELL-DYN Emerald must conform to the guidelines established by the regulatory agencies governing the laboratory open mode, as system has only one mode/WBC, RBC, HGB, MCV, PLT per regulatory requirement/— 9.8 μ L/—/— yes (multiple sizes due to open mode)	yes 90/90 6 months verification
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	—	open & closed/WBC, RBC, Hb, MCV, Plt as per regulatory requirement/— 130 μ L/355 μ L/1.0 mL yes (13 \times 75 mm) yes yes yes (flags only)
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes no 60,000 results on USB and 1,500 results on internal memory 60,000 results on USB and 1,500 results on internal memory 60,000 results on USB and 1,500 results on internal memory yes yes yes yes no no no no no no no yes	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes no yes user or vendor yes yes yes yes
LIS interface formats supported Information transferred on LIS interface	proprietary (instrument or vendor specific) numeric and flag results, instrument to LIS	proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	no — no	no — yes enhanced QC, data archiving, data collation from multiple instruments
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube	— Codabar, codes 39 & 128, interl. 2 of 5, Chinese post, code 93, EAN8, EAN13, EAN128, IATA, industrial 2of5, Italian pharmaceutical, matrix 2 of 5, MSI/Plessey, UK/Plessey, Telepen, TriOptic, S-Code, UPC A, UPC E	— Codabar, codes 39 & 128, interl. 2 of 5
Accommodates bar-code placement per CLSI standard Auto2A	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 Mfr. can perform diagnostics via modem	daily: 3 min; monthly: 5 min; bi-annually: 10 min yes dependent upon service contract no/no no	daily: 30 sec; bi-weekly: 5 min; monthly: 10 min yes — yes/no —
Acquisition program based on cost-per-reportable result	no	yes
Distinguishing features	small: sample size, reagent volumes used, and physical size; reliable: system averages one service call per year; easy to use: system has touchscreen software with intuitive icons and minimal layers	MAPSS cell-by-cell analysis provides enhanced diff.; retic. with reportable IRF (immature retic. fraction); 60-species veterinary package

Hematology analyzers

Part 3 of 12	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000 714-993-8438 www.beckmancoulter.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	CELL-DYN 3200 1997/1997/— —/—/\$165,000	LH 1500 Hematology Automation Series 2002/2003/15 >65/25/varies
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, % neut, mono, lymph, eos, baso): • Laboratory • Flags FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	standard menu (left) plus: RDW, MPV band %%, IG %%, variant lymph %%, blast %%, PCT, PDW, NRBC %%, band, IG, variant lymph, blast, NRBC, NWBC, RRBC, FWBC, RBC morph., high/low interp. message, LRI, URI, LURI, WBC none none none atypical depolarization flag outside U.S. 3-D optical RBC analysis with advanced MCV measurement	standard menu (left) plus: RDW, MPV, retic %%, IRF, graded RBC morph., NRBC %%, TNC & RBC on CSF, synovial and serous fluids — user-definable age-, gender-, &/or location-based ref. intervals; action & critical limits; user-def. RBC morph.; user-selectable sensitivity for diff., abnormal population suspect messages — — — MSCV, HLR %%, PDW, PCT, WBC research population data (RPD) LH 780: MAF, RSF, RDWR-SD, RDWR-CV IVD: NRBC, body fluids; RUO: MSCV, WBC RPD
Differential method(s) used Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin Interfering substances: differential	MAPSS (Multi-Angle Polarized Scatter Separation) 0–250 K/ μ L/0–8 M/ μ L 0–25 g/dL/0–1,750 K/ μ L 34–172 fL (MCV) \leq 2.7%/1.5% \leq 1.0%/4.0% \leq 1.0% (MCV) neut %%: \geq 0.95, —; lymph %%: \geq 0.94, —; mono %%: \geq 0.86, —; eos %%: \geq 0.84, —; baso %%: \geq 0.73, — NRBCs, lytic-resistant RBCs, Plt clumps, cryoglobulin and cryofibrinogen, fragile WBCs elevated WBC count, increased No. giant Plts, autoagglutination, in vitro hemolysis MCV: elevated WBC count, hyperglycemia, in vitro hemolysis, increased No. giant Plts WBC fragments, in vitro hemolysis, microcytic RBCs, cryoglobulins, Plt clumping, increased No. giant Plts elevated WBC count, incr. plasma substances (triglycerides, bilirubin, in vivo hemolysis), lyse-resistant RBCs see WBC	Coulter's 3-D VCS biophysical flow cytometry with IntelliKinetics, AccuGate & AccuFlex technologies 0–400/0–8.0 0–25/0–3,000 50–200 (MCV) <1.7%/<0.8% <0.8%/<3.3% <0.8% (MCV) lymph% = \pm 3.0%, —; neut% = \pm 3.0%, —; mono% = \pm 2.0%, —; eos% = \pm 1.0%, —; baso% = \pm 1.0%, — unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, giant Plt, Plt clumps very high WBC, high conc. large Plt, autoagglutinins very high WBC, high conc. large Plt, autoagglutinins very small RBCs & WBC frags. may interfere very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs high triglycerides may affect lysing
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes 71/71 6 months verification open & closed/WBC, RBC, Hb, MCV, Plt, MPV as per regulatory requirement/— 150 μ L/240 μ L/1 mL (sample loader) yes no yes yes —/\$125,000	yes 105 per analyzer on automation system/105 per analyzer on automation sys. as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV per CLIA, CAP, JCAHO, state or lab SOP/once per day 200 μ L/300 μ L, 550 μ L with slidemaker/1.0 mL yes no yes yes >850 (U.S.)/\$110,000
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes no yes user or vendor yes yes yes yes	yes yes 20,000 samples per instrument 20,000 samples per instrument 20,000 samples per instrument yes yes yes yes yes user or vendor yes yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no — yes enhanced QC, data archiving, data collation from multiple instruments — Codabar, codes 39 & 128, interl. 2 of 5 yes	RS-232 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no contact technical support yes, DL2000, Command Central enhanced QC, data archiving, data collection from multiple instruments, extensive decision rules, delta checking, patient results & graphics Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5, NW7 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 Mfr. can perform diagnostics via modem	daily: 30 sec; weekly: 5 min; monthly: 10 min yes — yes/no —	daily: automation system= 5 min, analyzer=0 min; weekly: automation=10 min, analyzer=0 min; monthly: automation=15 min, analyzer=2 min yes — yes/no yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	MAPSS cell-by-cell analysis provides enhanced diff.; focused flow 2-D optical RBC and Plt analysis provides better separation between microcytic RBCs and large Plts; uses only three reagents; 3-D MCV	system automatically loads and unloads cassettes, performs reflex and repeat testing, sorts tubes for off-line tests, stores tubes with availability for retrieval for any type of test; multiple configurations available; RUO: WBC research population data

Hematology analyzers

Part 4 of 12	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000 714-993-8438 www.beckmancoulter.com	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000 714-993-8438 www.beckmancoulter.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	LH 780/LH 785 2006/2007/160 >160/>150/LH 780: \$214,500; LH 785: \$389,500	Coulter LH 750/LH 755 2001/2001/250 (U.S.) >2,400/>2,300/LH 750: \$195,000; LH 755: \$367,500
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	standard menu (left) plus: RDW, RDW-SD, MPV, Retic %&#, IRF, MPV, graded RBC morph., NRBC %&#, TNC & RBC on CSF, synovial and serous fluids — user-definable age-, gender-, &/or location-based ref. intervals; action and critical limits, user-def. RBC morph.; user-def. sensitivity for diff. abnormal populations, suspect and definitive messages — — — RSF, MAF, MSCV, HLR %&#, RDWR-CV, RDWR-SD, PDW, PCT, WBC research population data (RPD) IVD: NRBC, body fluids, RDW-SD; RUO: MSCV, RSF, MAF, WBC RPD	standard menu (left) plus: RDW, MPV, retic %&#, IRF, MPV, graded RBC morph., NRBC %&#, TNC & RBC on CSF, synovial and serous fluids — user-definable age-, gender-, &/or location-based ref. intervals; action & critical limits; user-def. RBC morph.; gradient msgs. (=+, ++, +++); user-selectable sensitivity for diff. abnormal population suspect messages — — — MSCV, HLR %&#, PDW, PCT, WBC research population data (RPD) IVD: NRBC, body fluids; RUO: MSCV, WBC RPD
Differential method(s) used Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin Interfering substances: differential	Coulter's 3-D VCS biophysical flow cytometry with Intellikinetics, AccuGate & AccuFlex technologies 0-400/0-8.0 0-25/0-3,000 50-200 (MCV) <1.7%/<0.8% <0.8%/<3.3% <0.8% (MCV) lymph% = ±3.0%, —; neut% = ±3.0%, —; mono% = ±2.0%, —; eos% = ±1.0%, —; baso% = ±1.0%, — unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, giant Plt, Plt clumps very high WBC, high conc. large Plt, autoagglutinins very high WBC, high conc. large Plt, autoagglutinins (MCV) very small RBCs & WBC frags. very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs high triglycerides may affect lysing	Coulter's 3-D VCS biophysical flow cytometry with Intellikinetics, AccuGate & AccuFlex technologies 0-400/0-8.0 0-25/0-3,000 50-200 (MCV) <1.7%/<0.8% <0.8%/<3.3% <0.8% (MCV) lymph% = ±3.0%, —; neut% = ±3.0%, —; mono% = ±2.0%, —; eos% = ±1.0%, —; baso% = ±1.0%, — unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, giant Plt, Plt clumps very high WBC, high conc. large Plt, autoagglutinins MCV & Hct: very high WBC, high conc. large Plt, autoagglutinins very small RBCs & WBC frags. may interfere very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs high triglycerides may affect lysing
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes 105/105 as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hgb, MCV, Plt, MPV per CLIA, CAP, JCAHO, state or lab SOP/once per day 200 µL/300 µL (550 µL with slidemaker)/1.0 mL yes no yes yes >50/\$110,000	yes 105/105 as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV per CLIA, CAP, JCAHO, state or lab SOP/once per day 200 µL/300 µL, 550 µL with slidemaker/1.0 mL yes (multiple sizes & styles) no yes yes, both >900 (U.S.)/\$110,000
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes 20,000 samples 20,000 samples 20,000 samples yes yes yes yes yes yes yes yes user or vendor yes yes yes yes	yes yes 20,000 samples 20,000 samples 20,000 samples yes yes yes yes yes yes yes user or vendor yes yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast no contact technical support yes, DL2000, Command Central enhanced QC, data archiving, data collection from multiple instruments, extensive decision rules, delta checking, patient results & graphics, centralized result management Beckman Coulter Codabar, codes 39 & 128, interl. 2 of 5 yes	RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000, Command Central 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
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 Mfr. can perform diagnostics via modem	daily: 0 min; weekly: 0 min; monthly: 2 min yes — yes/no yes	daily: 0 min; weekly: 0 min; monthly: 2 min yes — yes/no yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	extensive onboard user-defined decision support; extended linearity for WBC and Plt using AccuCount technology; enumeration of NRBCs with every differential; random access/automation ready; integrated slidemaker/slidestainer options; proservice; electronic IQAP; expanded QC module; RUO: WBC research population data	extensive decision support; enumeration of NRBCs with every diff.; random access; automation ready; extended linearity for WBC and Plts; RUO: WBC RPD

Hematology analyzers

Part 5 of 12	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000 714-993-8438 www.beckmancoulter.com	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000 714-993-8438 www.beckmancoulter.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Coulter LH 500 2003/2003/200 (U.S. only) >1,150/>1,700/\$145,000	Coulter HmX 1999 HmX AL, 1999 HmX CP/196 (U.S. only) AL: >1,250/>2,200/\$135,000; CP: 160/300/\$120,000
Test menu: • Chartable (<i>standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso</i>): • Laboratory • Flags	standard menu (left) plus: retic #, retic %, MRV, IRF, RDW, MPV — user-definable age-, gender- &/or location-based ref. intervals, action & critical limits; user-def. RBC morph.; gradient msgs.	standard menu (left) plus: RDW, MPV, retic #&%, graded RBC morph., IRF, MRV — comprehensive high/low, definitive & suspect messages
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none none PCT, PDW	none none none PCT, PDW
Tests unique to analyzer	none	none
Differential method(s) used Linearity: • WBC count ($10^9/L$)/RBC count ($10^{12}/L$) • Hemoglobin (g/dL)/platelet ($10^9/L$) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin Interfering substances: differential	Coulter's 3-D biophysical flow cytometry with AccuGate 500, Reaction Manager technologies 0–200/0–8.0 0–25/0–2,000 50–150 (MCV) 2.5%/≤2.0% 1.5%/≤5.0% 2% (MCV) lymph= ±1.5 % mean diff., —; mono= ±1.5 % mean diff., —; neut= ±2.0% mean diff., —; eos= ±0.5 % mean diff., —; baso= ±0.5 % mean diff., — lyse-resistant, nucleated RBCs, frag. WBCs, agglut. WBCs, unlysed particles >35 fL, very large or agg. Plts, fibrin, cell frag., or other debris very high WBC count, many very large Plts, agglut. RBCs, RBCs <36 fL, fibrin, cell fragments, or other debris MCV: very high WBC count, high concentration of very large Plts, agglut. RBCs, RBC fragments <36 fL, rigid RBCs very small red cells near the upper threshold, cell fragments, clumped Plts, Plt frag. or cellular debris near the lower Plt threshold, giant Plts, Plt clumps, red & white cell frag., electronic noise, very small red cells very high WBC count, severe lipemia, heparin, lyse-resistant RBCs, turbidity such as elevated triglycerides factors that affect WBC count above or high triglycerides that affect lysing, hypogran. granulocytes, agranul. granulocytes, lyse-resist. red cells, very small or multi-population lymphocytes, elevat. trigly., precipitated elev. proteins	Coulter's 3-D VCS technology 0–99.9/0–7.0 0–25/0–999 50–150 (MCV) <2.5%/<2.0% <1.5%/<5.0% <2.0% (MCV) lymph%= ±3.0%, —; mono%= ±2.0%, —; neut%= ±3.0%, —; eos%= ±1.0%, —; baso%= ±1.0%, — unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, large Plt very high WBC, high conc. of very large Plt, autoagglutinins MCV & Hct: very high WBC, high conc. of large Plt, autoagglutinins very small RBCs & WBC frags. may cause no fit very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs high triglycerides may affect lysing
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes 75/75 as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV not specified/once per day 125 µL/185 µL/tube dependent yes (10.25 × 75 mm or less; 13 × 75 mm or less) no yes no —	gender-specific printout 75/75 as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV not specified/once per day 125 µL/185 µL/50 µL predilute/0.5 mL yes (multiple sizes & styles) no yes no —
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes 20,000 samples 20,000 samples 20,000 samples yes yes yes yes yes yes user yes yes yes	yes yes 5,000 samples 5,000 samples 5,000 samples yes yes yes yes no yes user or vendor yes, through a selective batch process 4 colors/cell types colors without thresholds no
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000, Command Central enhanced QC, data archiving, data collation from multiple instruments, common database, extensive decision rules, delta checking, patient results & graphics, centralized management of instruments — Codabar, codes 39 & 128, ASTM, interl. 2 of 5, NW7 yes	RS-232, proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000 enhanced QC, data archiving, common database, delta checking, patient results & graphics — Codabar, codes 39 & 128, interl. 2 of 5, NW7 no
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 Mfr. can perform diagnostics via modem	none yes — yes/no yes	none no — yes/no no
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	extensive decision support, extended linearity for WBC & Plt, low review rate, small footprint, superior reliability, ProService, electronic IQAP	VCS technology; low review rate; no routine daily maintenance; triplicate counting; aperture burn circuit; sweepflow; SmartStart system; autoloader and single-sample models

Hematology analyzers

Part 6 of 12	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 200 S. Kraemer Blvd. Brea, CA 92822-8000 714-993-8438 www.beckmancoulter.com	Horiba ABX Diagnostics Inc. Jim Knowles jknowles@us.abx.fr 34 Bunsen Irvine, CA 92618 888-903-5001 ext. 553 www.abx.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Coulter Ac•T 5diff Family; Ac•T 5diff AL 2001/2000; 2003/2003; cap pierce: not applicable, autoloader: not applicable 900/3,000/\$43,500 cap pierce model; 300/750/\$54,500 autoloader model	Pentra 60C+ Hematology Analyzer 2000/2000/85 425/865/\$43,310
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags	standard menu (left) plus: RDW, MPV atyp. lymph. # (ATL#), atyp. lymph % (ATL%), immature cells # (IMM#), immature cells % (IMM%), PCT, PDW complete operator selectable flagging	standard menu (left) plus: RDW, MPV atyp. lymph, atyp. lymph %, LIC, LIC % operator selectable flagging
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none none PCT, PDW, IMM, ATL	none none none PCT PDW
Tests unique to analyzer	none	none
Differential method(s) used	AcV technology combining cytochemistry, focused flow impedance, and light absorbance principles of measurement	DHSS technology combining cytochemistry, focused flow impedance, & light absorbance principles of measurement
Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%)	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 1.8–63.8 (Hct)*	0–120/0–8 0.7–24/0–1,900 0.7–67 (Hct)
Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct	<2%/<2% <1%/<5% <1.0% (Hct); AL: <2.0% (Hct)	<2%/<2% <1%/<5% <2% (Hct)
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	not available in NCCLS H-20A format	neut% r=0.99, —; lymph% r=0.98, —; mono% r=0.96, —; eos% r=0.89, —; baso% r=0.54, —
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	NRBCs, Plt clumps, large Plts, lyse-resistant RBCs cold agglutinins, Plt clumps, WBC overlinearity Hct: lipemic samples, high WBC, cold aggluts RBC and WBC fragments elevated WBC, lipemia	NRBCs, Plt clumps, lyse-resistant RBCs cold agglutinins Hct: extreme leukocytosis microcytes, Plt clumps extreme lipemia/leukocytosis
Interfering substances: differential	lyse-resistant RBCs, NRBCs, lipemia	NRBC, lyse-resistant RBCs, extreme hyperbilirubinemia
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 60/60; 80/80 not specified by time	yes 60/60 6 months
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed	open or closed/RBC, WBC, Hb, Hct, Plt not specified/none 30 µL for CBC/30 µL/varies by tube size; 53 µL for CBC-diff./53 µL for CBC-diff./varies by tube size	closed-open/WBC, RBC, Hb, Hct, Plt, MPV per CLIA standards/none 30 µL for CBC & 53 µL for CBC + diff./30 µL for CBC & 53 µL for CBC + diff./—
Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes (multiple sizes) no yes no —	yes (multiple sizes) yes yes yes —
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes no 10,000 samples 10,000 samples 10,000 samples yes yes yes yes no yes user or vendor yes, through user-defined criteria no yes yes	yes yes, with backup drive unlimited with backup drive 10,000, unlimited with backup drive 10,000, unlimited with backup drive yes yes yes yes yes user yes yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	proprietary; proprietary ASTM numeric & flag results, histograms & diff. plots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000, Command Central enhanced QC, data archiving, common database, optional data mgmt., extensive decision rules, delta checking, patient results & graphics available, centralized management of all instruments	ASTM 1394 & 1238, HL7, IEEE MIB numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, LIS to instrument—broadcast yes — yes (MultiLink) enhanced QC, data archiving with Data Manager
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	no Codabar, codes 39 & 128, interl. 2 of 5, EAN 8 & 13 yes	no Codabar, codes 39 & 128, ASTM, interl. 2 of 5 yes
Time required for maintenance by lab personnel	none	weekly: 15 min
Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mfr. can perform diagnostics via modem	yes — yes/no no	yes 24 hrs yes/yes yes, with Data Manager
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	quant. five-part WBC diff.; aspirates only 30 µL of sample; requires small space footprint and runs quietly; AL has auto repeat based on decision rules	reliable five-part WBC diff. technology—MTBF over 200 days; small footprint; small sample size of 53 µL

* linearity stated for Ac•T 5diff CP

Hematology analyzers

Part 7 of 12	Horiba ABX Diagnostics Inc. Jim Knowles jknowles@us.abx.fr 34 Bunsen Irvine, CA 92618 888-903-5001 ext. 553 www.abx.com	Horiba ABX Diagnostics Inc. Jim Knowles jknowles@us.abx.fr 34 Bunsen Irvine, CA 92618 888-903-5001 ext. 553 www.abx.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Pentra XL 80 2004/2003/106 155/425/\$70,310	Pentra DX120 2005/2004/151 30/540/\$190,000
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags	standard menu (left) plus: automatic dilution of overrange results (WBC \times 3, RBC/hgb/Plt \times 2), RDW, MPV atyp. lymph, atyp. lymph%, LIC, LIC% operator selectable flagging	standard menu (left) plus: NRBCs, reticulocytes, IRF, MRV LIC%&#, atyp lymphs %&#, IMG %&#, IML %&#, IMM %&#, RETL%, RETM%, RETH%, IMR%, MRU, MFI%, CRC% —
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none none PCT PDW	none none none PCT PDW, IMG, IML, IMM
Tests unique to analyzer	automatic dilution protocol	—
Differential method(s) used	DHSS technology combining cytochemistry, focused flow impedance & light absorbance	cytochemistry (chlorazol black E) and absorbance
Linearity: • WBC count (10^9 /L)/RBC count (10^{12} /L) • Hemoglobin (g/dL)/platelet (10^9 /L) • MCV (fL) or Hct (%)	0–120/0–8 0–24/0–1,900 (>2 g/dL Hb) 0–67 (Hct)/0–2,800 (<2 g/dL Hb)	0–150/0.5–8.1 2–25/0–2,000 0–80 (Hct)
Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct	<2%/<2% <1%/<5% <2% (Hct)	<2%/<2% <1%/<5% <2% (Hct)
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.99, —; lymph% r=0.98, —; mono% r=0.96, —; eos% r=0.89, —; baso% r=0.54, —	neut% r=0.99, —; lymph% r=0.98, —; mono% r=0.92, —; eos% r=0.97, —; baso% r=0.71, —
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	NRBCs, Plt clumps, lyse-resistant RBCs cold agglutinins Hct: extreme leukocytosis microcytes, Plt clumps extreme lipemia, leukocytosis	NRBCs, Plt clumps, lyse-resistant RBCs cold agglutinins Hct: extreme leukocytosis microcytes, Plt clumps extreme lipemia, leukocytosis
Interfering substances: differential	NRBCs, lyse-resistant RBCs, extreme hyperbilirubinemia	NRBCs, lyse-resistant RBCs, extreme hyperbilirubinemia
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 80/80 6 months	yes 120/120 6 months
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed	open, closed/WBC, RBC, Hb, Hct, Plt, MPV per CLIA standards/none 30 μ L for CBC/53 μ L for CBC + diff./0.5 mL	open, closed/WBC, RBC, Hb, Hct, Plt, MPV per CLIA standards/none 130 μ L/200 μ L/1 mL
Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes (autoloader 13 \times 75 mm; closed tube 16 sizes + micro) yes yes yes —/—	yes yes yes, open mode yes —/—
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes, with MultiLink Data Manager MultiLink Data Manager; 10,000 instrument only MultiLink Data Manager; 10,000 instrument only MultiLink Data Manager yes yes yes yes yes yes user yes yes yes —	yes yes unlimited Data Manager; 10,000 instrument only unlimited Data Manager unlimited Data Manager yes yes yes yes yes user — yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	proprietary, ASTM 1394 & 1238, HL7, IEEE MIB numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast — yes (MultiLink) enhanced QC, data archiving, data collation from multiple instruments	proprietary, ASTM 1394 & 1238, HL7, IEEE MIB numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast — yes (MultiLink) enhanced QC, data archiving, data collation from multiple instruments
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	yes Codabar, codes 39 & 128, ASTM, interl. 2 of 5 yes	yes Codabar, codes 39 & 128, ASTM, interl. 2 of 5 yes
Time required for maintenance by lab personnel	weekly: 15 min	weekly: 15 min
Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	yes 24 hrs no/yes yes	yes — no/yes yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	compact five-part differential instrument with autoloader and autodilution capability, autorerun feature, autovalidation	high-throughput cell counter with integrated reticulocyte methodology and slidemaker/stainer; fluorescent NRBC counting, auto rerun and reflex testing, autovalidation

Hematology analyzers

Part 8 of 12	Siemens Healthcare Diagnostics Rita White rita.f.white@siemens.com 500 GBC Drive Newark, DE 19702 888-899-2896 www.siemens.com/diagnostics	Siemens Healthcare Diagnostics Rita White rita.f.white@siemens.com 500 GBC Drive Newark, DE 19702 888-899-2896 www.siemens.com/diagnostics
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Advia 120 Hematology System 1998/1998/— >750/3,500/\$169,000–\$189,000	Advia 2120 Hematology System 2004/2004/— >200/>900/\$225,000
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, % neut, mono, lymph, eos, baso): • Laboratory • Flags FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic %&#, Chr, CHCMr, MCVR; CSF: WBC, RBC, PMN, MN, neut, lymph, mono; cellular Hgb %: hypo, hyper, macro, micro; calc. Hb, MPXI; %: blasts, PMN, MN; large Plt count; RBC frag. count; RBC ghost count left shift, atyp. lymph, blasts, immature grans, myeloperox. deficiency, aniso, micro, macro, Hb variation, hypo, hyper, NRBC, RBC frag., RBC ghost, large Plt, Plt clumps none none IRF, MPC, MPM CSF, eos CHCM, HDW, Chr, CHCMr, MPC, MPM; CSF: WBC RBC, MN, PMN, neut, lymph, mono	standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic %&#, Chr, CHCMr, cellular Hgb, MCVR; CSF: WBC, RBC, PMN, MN, neut, lymph, mono % hypo, hyper, macro, micro; MPXI, %: blast, PMN, MN, large Plt count, RBC fragment count; RBC ghost count, NRBC left shift, atyp. lymph, blasts, immature grans, myeloperox. deficiency, aniso, micro, macro, Hb variation, hypo, hyper, NRBC, RBC frag., RBC ghost, large Plt, Plt clumps none none MPC, MPM IRF, CSF, eos CHCM, HDW, Chr, CHCMr, cellular Hgb, MPC, MPM, CSF: WBC, RBC, PMN, MN, neut, lymph, mono
Differential method(s) used Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin Interfering substances: differential	perox–peroxidase cytochem. staining with light scatter & absorption; baso–cytochem. stripping with 2-angle laser light scatter 0.02–400/0–7.0; CSF WBC 0–5,000/ μ L; CSF RBC 0–1,500/ μ L 0–22.5 /5–3,500 30–180 (MCV) 2.7%/1.2% 0.93%/2.93% 0.78% (MCV) neut% r=0.997, y=1.02x–0.6; lymph% r=0.997, y=1.00x+0.8; mono% r=0.943, y=0.85x–0.3; eos% r=0.979, y=0.87x+0.2; baso% r=0.772, y=0.67x+0.0; luc% r=0.994, y=0.92x+0.6 incomplete RBC lysis (perox only) cold agglutinins, extreme sickle cell none none high WBC, lip., extremely high bili., interfere with cyanmethb. only, none with direct cellular Hb (CHCM) incomplete lysis of RBCs, complete myeloperox. deficiency	peroxidase WBC—peroxidase cytochem. staining w/ light scatter & absorption; baso—cytochem. stripping w/ 2-angle laser light scatter 0.02–400; CSF WBC 0–5,000/0–7.0; CSF RBC 0–1,500 0–22.5/5–3,500 30–180 (MCV) 2.7%/1.2% 0.93%/2.93% 0.78% (MCV) neut% r=0.997, y=1.02x–0.6; lymph% r=0.997, y=1.00x+0.8; mono% r=0.943, y=0.85x–0.3; eos% r=0.979, y=0.87x+0.2; baso% r=0.772, y=0.67x+0.0; luc% r=0.994, y=0.92x+0.6 incomplete RBC lysis (peroxidase only) cold agglutinins, extreme sickle cell none none extreme lipemia, high WBC, extreme high bili. interference w/ colorimetric Hb only, none with cellular Hb incomplete RBC lysis, complete myeloperox. deficiency
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes 120/120 6 months open, closed, autosampler/all measured parameters once per shift/not required 157 μ L/157 μ L/<300 μ L (tube size dependent) yes (2, 3, 5, 7 mL—all sizes—open tube) yes yes yes —	yes 120/120 6 months autosampler, closed, open/all measured parameters once per shift/not required 175 μ L/175 μ L/<300 (tube size dependent) yes (2, 3, 5, 7 mL—all sizes open) yes yes if integrated to Advia Autoslide Advia Autoslide, —/\$98,000
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes no 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes	yes no 10,000 10,000 10,000 yes yes yes yes yes yes yes yes yes yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	proprietary (Spec 79) numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast; host query for demographics & orders no online documentation yes (Centralink) enhanced QC, data archiving, data collation from multiple instruments, autovalidation, integrated diff. pad, remote diagnostics, remote workstations LabCell (Siemens) Codabar, codes 39 & 128, ASTM, interl. 2 of 5 yes	proprietary numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument— broadcast; host query for patient demographics and orders (when bar code is read, host is queried for orders) no online documentation yes (Centralink) enhanced QC, data archiving, data collation from multiple instruments, autovalidation, integrated diff. pad, remote diagnostics, remote workstations LabCell (Siemens) Codabar, codes 39 & 128, interl. 2 of 5 —
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 Mfr. can perform diagnostics via modem	daily: 10 min; weekly: 15 min; monthly: 15 min yes territory dependent yes/no yes	daily: 0 min; weekly: 15 min; monthly: 15 min yes territory dependent yes/no yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	unique laser technology provides cellular Hb for RBCs and retics; 2-D Plt analysis that eliminates interference from RBC fragments and inclusion of large Plts; dual WBC counts with a linearity of up to 400,000; CSF assay	unique laser technology provides direct cellular Hb for RBCs and retics; 2-D Plt analysis that eliminates interference from RBC fragments and inclusion of large Plts; dual WBC counts with a linearity of up to 400,000; CSF assay

Hematology analyzers

Part 9 of 12	Siemens Healthcare Diagnostics Rita White rita.f.white@siemens.com 500 GBC Drive Newark, DE 19702 888-899-2896 www.siemens.com/diagnostics	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Advia 2120i 2008/2008/— —/—/\$225,000	XE-5000 2008/2007/— 80/400/\$265,122
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %neut, mono, lymph, eos, baso): • Laboratory • Flags FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic. %&#, Chr, CHCMr, cellular Hgb, MCVr; CSF: WBC, RBC, PMN, MN, neut, lymph, mono %lypo, hyper, macro, micro, MPXI, %blast, PMN, MN, large Plt count, RBC fragment count, RBC ghost count, NRBC left shift, atyp. lymph, blasts, immature grans, myeloperox. deficiency, aniso, micro, macro, Hgb variation, hypo, hyper, NRBC, RBC frag, RBC ghost, large Plt, Plt clumps none none MPC, MPM IRF, CSF eos CHCM, HDW, Chr, CHCMr, cellular Hgb, MPC, MPM, CSF: WBC, RBC, PMN, MN, neut, lymph, mono	standard menu (left) plus: NRBC %&#, retic %&#, RDW-SD, RDW-CV, IRF, Plt-O, HPC#, MPV, IG%, IG#, RET-He, IPF none 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 none none none none reticulocyte hemoglobin, immature platelet fraction, hematopoietic progenitor cell, immature reticulocyte fraction
Differential method(s) used Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin Interfering substances: differential	peroxidase WBC: peroxidase cytochem. staining w/ light scatter & absorption; baso: cytochem. stripping w/ two-angle laser light scatter 0.02–400 CSF: 0–5,000/0–7.0 CSF: 0–1,500 0–22.5/5–3,500 30–180 (MCV) 2.7%/1.2% 0.93%/2.93% 0.78% (MCV) neut% r=0.997, y=1.02x-0.6; lymph% r=0.997, y=1.00x+0.8; mono% r=0.943, y=0.85x-0.3; eos% r=0.979, y=0.87x+0.2; baso% r=0.772, y=0.67x+0.0; luc% r=0.994, y=0.92+0.6 incomplete RBC lysis (peroxidase only) cold agglutinins, extreme sickle cell none none extreme lipemia, high WBC, extreme high bili.—interference w/colorimetric Hgb only, none with cellular Hgb incomplete RBC lysis, complete myeloperoxidase deficiency	fluorescent flow cytometry, RF/DC detection method 0–440/0–8 0–25/0–5,000 0–75 (Hct) <3%/<1.5% <1.0%/<4.0% <1.5% (Hct) neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922 cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis Hct: cold agglutinins, leukocytosis, ABN red cell fragility, spherocytosis pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts lipemia, ABN proteins, leukocytosis (>100,000/μL) lyse-resistant RBCs
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes 120/120 6 months auto sampler, closed, open/all measured parameters once per shift/not required 175 μL/175 μL/<300 (tube size dependent) 2, 3, 5, 7, mL closed—all tube sizes open yes yes yes Advia Autoslide, —/\$98,000	yes 150/150 once per year by FSR open, closed, capillary/WBC, RBC, Hb, Hct, Plt 2 levels once every 24 hours (minimum per CLIA)/none 130 μL/200 μL/1 mL yes no yes yes (with Alpha or HST upgrade) >1,200/price depends on configuration
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes no 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	proprietary (instrument or vendor specific) numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast; host query for demographics & orders no Web site: online documentation yes, CentralLink enhanced QC, data archiving, data collation from multiple instruments, autovalidation, integrated diff. pad, remote diagnostics, remote workstations LabCell (Siemens) Codabar, codes 39 & 128, ASTM, interleaved 2 of 5 yes	ASTM 1394, TCP-IP, ASTM E1381 numeric & flag results, histograms & scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast; host query for demographics & orders yes contact vendor yes, Sysmex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments, rules setting Roche Diagnostics, Labotix, A & T, Thermo, IDS Codabar, codes 39 & 128, ASTM, interleaved 2 of 5, ITF, NW7, EAN 8 & 13 —
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 Mfr. can perform diagnostics via modem	daily: 10 min; weekly: 15 min; monthly: 15 min yes territory dependent yes/no yes	daily: <3 min yes <24 hours yes/no yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	laser technology provides direct cellular Hgb for RBCs and retics; 2-D Plt analysis eliminates interference from RBC fragments and inclusion of large Plts; dual WBC counts with a linearity of up to 400,000; CSF assay	low-end linearity for all body fluids; two-part differential (mono nuclear% + # and polymorphonuclear % + H) or body fluid; reticulocyte hemoglobin content; immature platelet fractions; throughput of 150 CBCs per hour; random access; discrete testing; online QC; remote diagnostics, body fluid analysis; platelet linearity to 5 million, hematocrit non-linear to 75%; hematopoietic progenitor cell testing; immature granulocyte enumeration; immature platelet fraction; reticulocyte hemoglobin equivalent; standardized reagents, controls and operations with other Sysmex X-Series analyzers

Hematology analyzers

Part 10 of 12	Sysmex America Inc. Tammy Kutz kutz@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa	Sysmex America Inc. Tammy Kutz kutz@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Sysmex XE-2100 1999/—/250 1,300/4,000/\$225,000	Sysmex XE-2100D 2004/2004/12 25/—/\$200,000
Test menu: • Chartable (<i>standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, % neut, mono, lymph, eos, baso</i>): • Laboratory • Flags	standard menu (left) plus: NRBC %&#, retic %&#, RDW-SD, RDW-CV, IRF, Plt-O, HPC#, MPV, IG%, IG#, RET-He, IPF none Plt clumps, RBC agglut, turbidity, WBC ABN scattergram, RBC ABN distrib., Plt ABN distrib., RBC lyse resistance, blasts, left shift, atyp. lymph., ABN lymph./blast., ret. ABN scattergram none none — P-LCR, PCT, PDW	standard menu (left) plus: RDW-SD, RDW-CV none 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 — — — P-LCR, PCT, PDW
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none — P-LCR, PCT, PDW	— — — P-LCR, PCT, PDW
Tests unique to analyzer	HPC#, IG%, IG#, RET He, IPF	Optional: IG% & IG#
Differential method(s) used	fluorescent flow cytometry, RF/DC detecting method	fluorescent flow cytometry
Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct	0–440/0–8 0–25/0–5,000 0–75 (Hct) <3%/<1.5% <1.0%/<4.0% <1.5% (Hct) neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922 cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs	0–440/0–8 0–25/0–5,000 0–75 (Hct) <3%/<1.5% <1.0%/<4.0% <1.5% (Hct) neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922 cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922 cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922 cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis Hct: cold agglutinins, leukocytosis, ABN red cell fragility, spherocytosis pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts lipemia, ABN proteins, leukocytosis (>100,000/μL)	cold agglut., severe microcytosis, frag. RBCs, leukocytosis Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts lipemia, ABN proteins, leukocytosis (>100,000/μL)
Interfering substances: differential	lyse-resistant RBCs	lyse-resistant RBCs
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 150/150 once per year by FSR	yes 150/150 once per year by FSR
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed	open, closed, capillary/WBC, RBC, Hb, Hct, Plt per requirements/none 130 μL/200 μL/1 mL	open, closed, capillary/WBC, RBC, Hb, Hct, Plt per CLIA requirements/none 130 μL/200 μL/1 mL
Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes no yes yes with Alpha or HST upgrade >1,000/price depends on configuration	yes no yes yes, with Alpha or HST upgrade >1,000/—
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes
LIS interface formats supported Information transferred on LIS interface	RS-232C/TCP IP numeric & flag results, histograms & scatterplots, patient demographics, orders	RS-232C/TCP IP numeric & flag results, histograms & scatterplots, patient demographics, orders
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	yes contact vendor yes, Sysmex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites on automation platform Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes	yes contact vendor yes, Sysmex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites on automation platform Codabar, codes 39 & 128, ASTM, interl. 2 of 5, ITF, NW7, EAN 8 & 13, ISBT yes
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	on automation platform Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes	on automation platform Codabar, codes 39 & 128, ASTM, interl. 2 of 5, ITF, NW7, EAN 8 & 13, ISBT yes
Time required for maintenance by lab personnel	daily: <3 min.	daily: <3 min.
Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mfr. can perform diagnostics via modem	yes <24 hours yes/no yes, also via Internet	yes <24 hours yes/no yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	throughput of 150 CBCs per hour; random access; discrete testing; online QC; remote diagnostics, body fluid analysis; platelet linearity to 5 million, hematocrit linear to 75 percent; hematopoietic progenitor cell testing; immature granulocyte enumeration; immature platelet fraction; reticulocyte hemoglobin equivalent; standardized reagents, controls and operations with other Sysmex X-Series analyzers	150 CBC/hr; platelet linearity—5 million, hematocrit extended to 75 percent; standardized technology, reagents, controls and operations; ISBT compliant

Hematology analyzers

Part 11 of 12	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	Sysmex XE-Alpha N/HST-N 2000/—/50 >600/1,100/\$360,000–\$1,000,000	Sysmex XT-2000i 2002/2001/125 4,305 worldwide/\$145,000
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags	standard menu (left) plus: RDW-SE, RDW-CV, IG%, IG#, NRBC%, NRBC#, retic%&#, IRF, Plt-O (fluorescent optical Plt), HPC#, MPV; RET-He (reticulocyte Hgb equivalent), IPF (immature platelet fraction), HPC (hematopoietic progenitor cells) none user defined, all inclusive	standard menu (left) plus: retic %&#, IRF, Plt-O, MPV, RDW-SD, RDW-CV, reticulocyte hemoglobin, immature granulocytes %&# none Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, NRBC, body fluids
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	none none — P-LCR, PCT, PDW NRBC, HPC#, IG%, IG#, Rct-He, immature platelet function (IPF)	— — — — Plt-O, immature granulocytes %&#, reticulocyte hemoglobin
Differential method(s) used	fluorescent flow cytometry, RF/DC detecting method	fluorescent flow cytometry
Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%)	0–440/0–8 0–25/0–5,000 0–75 (Hct)	0–310/0–8 0–25/0–5,000 0–60 (Hct)
Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct	<3%/<1.5% <1.0%/<4.0% <1.0% (Hct)	≤3.0%/≤1.5% ≤1.5%/≤4.0% ≤1.5% (Hct)
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922	neut% r=0.95, y=0.95x+3.38; lymph% r=0.96, y=0.85x+1.67; mono% r=0.90, y=1.137x+1.89; eos% r=0.94, y=0.87x+0.04; baso% r=0.76, y=0.48x+0.24
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis Hct: cold agglut., leukocytosis, ABN red cell fragility, spherocytosis pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts lipemia, ABN proteins, leukocytosis (>100,000/μL)	cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs cold agglut., severe microcytosis, frag. RBCs, leukocytosis Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/μL) pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts lipemia, ABN proteins, leukocytosis (>100,000/μL)
Interfering substances: differential	lyse-resistant RBCs	lyse-resistant RBCs
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 150/150 per analyzer on automation system once per year by FSR	yes 80/80 once per year by FSR
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed	open, closed, capillary/WBC, RBC, Hb, Hct, Plt per CLIA requirements/none 130 μL/200 μL/1 mL	open, closed, capillary/— per CLIA requirements/none 85 μL/150 μL/1 mL
Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes no yes yes >1,700/\$250,000	yes yes, XT-V product yes no —
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes yes yes yes
LIS interface formats supported Information transferred on LIS interface	RS-232C/TCP IP numeric & flag results, histograms & scatterplots, patient demographics, orders	RS-232/TCP-IP, ASTM numeric & flag results, histograms & scatterplots, patient demographics, orders
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	yes contact vendor yes, Sysmex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites	yes contact vendor yes, Sysmex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	Roche, Labotix, IDS, A&T, Thermo engen Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes	— Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 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 Mfr. can perform diagnostics via modem	daily: <3 min yes <24 hours yes/no yes, also via Internet	daily: <3 min yes <24 hours yes/no yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	high throughput, flexible, scalable configurations available (>125 standard configurations); platelet linearity—5 million; new parameters for platelet monitoring—IPF & retic Hb measurement & RET He, hematopoietic progenitor cell analysis, lavender top management, standardized technology, reagents, controls, and operations	high throughput, remote diagnostics; online QC; random access; fluorescent optical platelets; discrete testing; reagent monitoring; customized chartable report formats; XT-V unit for use in toxicology & research and veterinary reference labs; body fluids now FDA cleared, standardized technology, reagents, controls, and operations with other X-Series analyzers

Hematology analyzers

Part 12 of 12	<p>Systemex America Inc. Tammy Kutz kutzt@systemex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.systemex.com/usa</p>	<p>Systemex America Inc. Tammy Kutz kutzt@systemex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.systemex.com/usa</p>
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2007 No. units installed in U.S./outside U.S./list price	<p>Systemex XT-1800i 2002/2001/40 797/4,305/\$125,000</p>	<p>XS-1000i and XS-1000i AutoLoader (20 sample autoloader option) 2006/2005/240 635/3,615/\$85,000 (XS-1000i) \$95,000 (AutoLoader)</p>
Test menu: • Chartable (standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso): • Laboratory • Flags	<p>standard menu (left) plus: MPV, RDW-SD, RDW-CV, immature granulocytes %&# none Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, NRBC, body fluids — none — — immature granulocytes</p>	<p>standard menu (left) plus: MPV, RDW-SD, RDW-CV none Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, NRBC none none IG% research screen —</p>
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	<p>— none — — immature granulocytes</p>	<p>— none none IG% research screen —</p>
Differential method(s) used	fluorescent flow cytometry	fluorescent flow cytometry
Linearity: • WBC count (10 ⁹ /L)/RBC count (10 ¹² /L) • Hemoglobin (g/dL)/platelet (10 ⁹ /L) • MCV (fL) or Hct (%)	<p>0–310/0–8 0–25/0–5,000 0–60 (Hct)</p>	<p>0–400/0–8 0–25/0–5,000 0–60 (Hct)</p>
Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct	<p>≤3.0%/≤1.5% ≤1.5%/≤4.0% ≤1.5% (Hct)</p>	<p>—/— —/— —</p>
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	<p>neut% r=0.95, y=0.95x+3.38; lymph% r=0.96, y=0.85x+1.67; mono% r=0.90, y=11.37x+1.89; eos% r=0.94, y=0.87x+0.04; baso% r=0.76, y=0.48x+0.24</p>	<p>neut% r=0.96, y=0.9074x+3.8948; lymph% r=0.97, y=0.9017x+2.4817; mono% r=0.78, y=0.8626x+3.5938; eos% r=0.94, y=0.9076x+0.3651; baso% r=0.29, y=0.1538x+0.298</p>
Interfering substances: • WBC • RBC • MCV or Hct • Platelet • Hemoglobin	<p>cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs cold agglut., severe microcytosis, frag. RBCs, leukocytosis Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/μL) pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts lipemia, ABN proteins, leukocytosis (>100,000/μL)</p>	<p>cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs cold agglut., severe microcytosis, frag. RBCs, leukocytosis Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/μL) pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts lipemia, ABN proteins, leukocytosis (>100,000/μL)</p>
Interfering substances: differential	lyse-resistant RBCs	lyse-resistant RBCs
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	<p>yes 80/80 once per year by FSR open, closed, capillary/— per CLIA requirements/none 85 μL/150 μL/1 mL yes yes, XT-V product yes no —</p>	<p>yes 60/60 once per year closed & capillary/— per CLIA requirements/none 20 μL/20 μL/1.0 mL yes (up to 85 mm height) no yes no —</p>
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results—No. specimens Memory capacity—histo/cytograms—No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen &/or result info. displayed	<p>yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes</p>	<p>yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes</p>
LIS interface formats supported Information transferred on LIS interface	<p>RS-232C/TCP-IP, ASTM numeric & flag results, histograms & scatterplots, patient demographics, orders</p>	<p>proprietary, ASTM 1394, TCP-IP numeric & flag results, histograms & scatterplots, patient demographics, orders</p>
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	<p>yes contact vendor yes, Systemex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites —</p>	<p>yes contact vendor yes, Systemex WAM (work area manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites —</p>
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	<p>— Codabar, codes 39 & 128, interl. 2 of 5, ITF, NW7, EAN 8 & 13 yes</p>	<p>— Codabar, codes 39 & 128, ASTM, interl. 2 of 5, NW7, EAN 8 & 13, ITF yes</p>
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	<p>daily: <3 min. yes <24 hours yes/no yes, also via Internet</p>	<p>daily: 3 min; weekly: none; monthly: 9 min yes <24 hours yes/no yes, also via Internet</p>
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	<p>remote diagnostics; online QC; random access; discrete testing; reagent monitoring; chartable report formats; XT-V for use in toxicology, research and veterinary reference labs; unique specimen-gating, software is FDA Part II compliant; body fluids now FDA cleared; standardized technology, reagents, controls, and operations with other X-Series analyzers</p>	<p>standardized technology, reagents, controls, and operations to other X-Series analyzers; small sample volume requirements for CBC + five-part diff.; remote diagnostics, online QC, discrete analysis, reagent monitoring, chartable report; remote calibration verification</p>