Applied Biosystems® SOLiD™ 3 Plus System

Key Benefits

- **Scalable throughput**—60+ GB of mappable sequence or greater than 1 billion reads per run for cost-effective research without costly upgrades
- **Superior accuracy**—more than 80% of bases with quality values greater than QV30 for higher confidence in your results
- **Broadest portfolio of application solutions**—application-specific kits and new bioinformatics analysis framework for end-to-end application workflows
- **Standard base data formats**—advanced software solutions with a 20% reduction in data footprint and SAM format with base calls and associated quality values for streamlined data analysis
- **Simplified workflow**—reduction in hands-on time with walk-away automation allowing significant time and labor savings
- **Maximum experimental flexibility**—increased throughput and lower running costs, helping maximize cost-effectiveness for individual project needs
- **Unrivaled support**—over 800 dedicated service and support specialists as well as a catalog of in-depth chemistry and bioinformatics courses available

Overview

The SOLiD™ 3 Plus System enables unsurpassed accuracy and throughput to discover biological variation across multiple samples in a single run. With the broadest portfolio of application-specific kits and analysis tools, the SOLID™ 3 Plus System translates your discoveries into biologically relevant information.

System Attributes

Cost-effective research without costly upgrades

The SOLiD™ 3 Plus System generates 60+ GB of mappable sequence or greater than 1 billion reads per run. This level of throughput enables large-scale resequencing and tag-based experiments to be completed more efficiently and rapidly than ever before. The SOLiD™ 3 Plus System's intrinsic open slide format and flexible bead densities facilitate increases in throughput without major system modifications.

The right answer, the first time

The SOLiD™ 3 Plus System enables superior accuracy and sensitivity to detect biological variation. The innate error-checking properties of 2 base encoding result in highly accurate base sequences; more than 80% of bases have quality values >30 and, subsequently, a very low empirical error rate (Figure 1). This attribute translates to less coverage required for variant detection, yields fewer false positives, and facilitates a corresponding reduction in validation for project time and cost savings.

Streamlined analysis and data management

The SOLiD™ 3 Plus System supports standard sequence alignment map (SAM) format with base calls and associated quality values. Experience the benefits of the higher accuracy enabled by 2 base encoding and the flexibility to export to standard downstream analysis tools. Advanced software solutions reduce analysis time through a 20–40% reduction in data footprint and real-time data export.

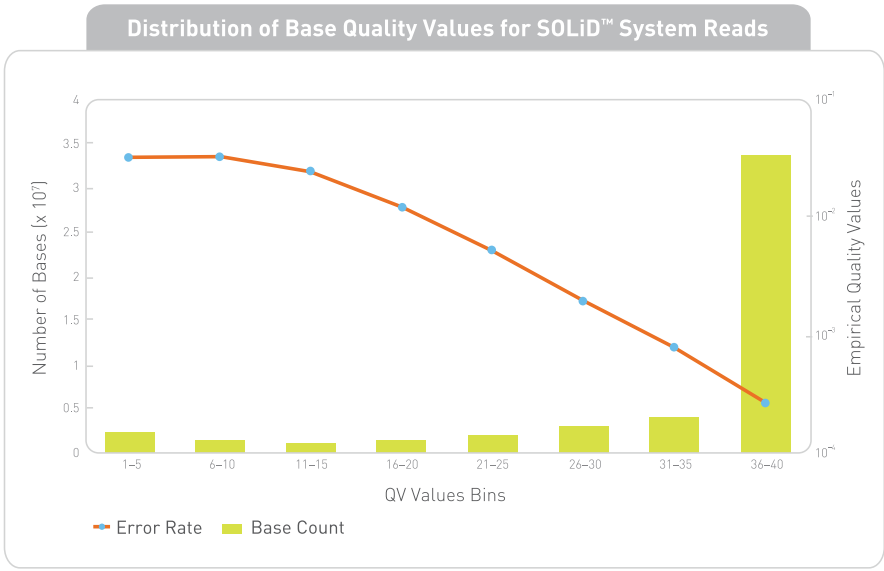

Figure 1. Distribution of bases and their empirical quality values from SOLiD™ System Sequencing. Due to 2 base encoding, the SOLiD™ 3 Plus System distinguishes itself by providing unfiltered data that are more accurate than alternative next-generation platforms for variation detection. This unrivaled accuracy is inherent in the system and permits users to obtain lower false positive rates.

SOLiD™ 3 Plus System Specifications	
Throughput	60+ GB of mappable sequence or 1 billion reads per run with SOLiD™ 3 Opti reagents
Library Type	• Mate-paired libraries (insert sizes from 600 bp to 10 kb) • Fragment libraries
Starting Material Type	DNA or cDNA isolated from blood or single cells, RNA, BACs, plasmids, fosmids, tissue (high tumor load), and PCR products
Amount of Starting Material	Required input of starting material varies by application • 10 ng to 5 µg for fragment library • 5 µg to 20 µg for mate-paired library
Slide Configuration	Individual samples: 1 to 8 per flowcell Multiplexed samples: up to 256 per run
Flowcells	2 independent flowcells
System Accuracy	Greater than 99.94% accuracy due to 2 base encoding
Consensus Base Accuracy	Greater than 99.999% accuracy at 15X coverage
Base Quality	Greater than 80% of bases at >QV30
Multiplexing	16 barcodes currently available
Analysis	• SAM format exports • Powerful computer cluster for large-scale application analysis • Customizable application analysis with new bioinformatics analysis framework for flexible data review

System Workflow Reagents and Analysis Tools

	Application	Sample Preparation[1]	Library Preparation	Templated Bead Production[2,3]	Sequencing	Data Analysis Resources
Tagging/Counting Applications	SAGE™	TRIzol® Reagent	SOLiD™ SAGE™ (PN 4443475)	SOLiD™ ePCR Kit V2 (PN 4400834); SOLiD™ Buffer Kit (PN 4387918); SOLiD™ Bead Enrichment Kit (PN 4387894); SOLiD™ Bead Deposition Kit (PN 4387895); SOLiD™ Slide Pack Kit (PN 4412172)	SOLiD™ Opti Fragment Library Sequencing Master Mix 35 (PN 4442218); SOLiD™ Opti Fragment Library Sequencing Master Mix 50 (PN 4442236); SOLiD™ Opti Fragment Library Sequencing Kit-5 bp Barcode Set (PN 4442261); SOLiD™ Instrument Buffer Kit (PN 4406479); SOLiD™ Workflow Analysis Reagents (PN 4406463)	SOLiD™ SAGE™ Analysis Software
	Whole Transcriptome[4]	RiboPure™ Kit	SOLiD™ Whole Transcriptome Analysis Kit (PN 4425680), SOLiD™ Transcriptome Multiplexing Kit (PN 4427046)			SOLiD™ Bioscope™ v1.0 Integrated Whole Transcriptome Analysis Pipeline
	Small RNA	*mir*Vana™ PARIS™ for cells and tissues (PN AM1556); RecoverAll™ Kit for FFPE samples (PN AM1975); *mir*Vana™ miRNA Isolation Kit for cells and tissues (PN AM1560)	SOLiD™ Small RNA Expression Kit (PN 4397682)			SOLiD™ System Small RNA Analysis Pipeline Tool (PN RNA2MAP)
	ChIP	Magnify Chromatin Immunoprecipitation System (PN 492024)	SOLiD™ Fragment Library Construction Kit with Size Select Gels (PN 4443471)[1]; SOLiD™ Fragment Library Oligos Kit (PN 4401151)			Applied Biosystems ChIP-Seq accessory tools
	Methylation	MethylMiner™ Methylated DNA Enrichment Kit (PN ME10025)	SOLiD™ Fragment Library Construction Kit with SizeSelect™ Gels (PN 4443471)[1]; SOLiD™ Fragment Library Oligos Kit (PN 4401151)			http://info.appliedbiosystems.com/solidsoftwarecommunity
	Application	Sample Preparation[1]	Library Preparation	Templated Bead Production[2,3]	Sequencing	Data Analysis Resources
Resequencing	Whole Genome Resequencing	BloodPrep® DNA Chemistry for Cultured Cells and Blood (PN 4342775)	SOLiD™ Fragment Library Construction Kit with SizeSelect™ Gels (PN 4443471)[1]; SOLiD™ Long Mate-Paired Library Construction Kit (PN 4443474); SOLiD™ 2X25 Mate-Paired Library Construction Kit (PN 4443472); SOLiD™ Mate-Paired Library Oligos Kit (PN 4400468); SOLiD™ Fragment Library Oligos Kit (PN 4401151)	SOLiD™ ePCR Kit V2 (PN 4400834); SOLiD™ Buffer Kit (PN 4387918); SOLiD™ Bead Enrichment Kit (PN 4387894); SOLiD™ Bead Deposition Kit (PN 4387895); SOLiD™ Slide Pack Kit (PN 4412172)	SOLiD™ Opti Fragment Library Sequencing Master Mix 35 (PN 4442218); SOLiD™ Opti Fragment Library Sequencing Master Mix 50 (PN 4442236); SOLiD™ Opti Fragment Library Sequencing Kit-5 bp Barcode Set (PN 4442261); SOLiD™ Opti Mate-Paired Library Sequencing Master Mix 35 (PN 4442057); SOLiD™ Opti Mate-Paired Library Sequencing Master Mix 50 (PN 4442058); SOLiD™ Instrument Buffer Kit (PN 4406479); SOLiD™ Workflow Analysis Reagents (PN 4406463)	SOLiD™ Bioscope™ v1.0 Integrated Resequencing Pipeline, which detects SNPs, small and large insertions and deletions, inversions, and copy number variation
	De Novo	PureLink™ Genomic DNA Mini Kit (PN 1820-00); ChargeSwitch® gDNA Mini Bacteria Kit (PN CS11301)	SOLiD™ Fragment Library Construction Kit with SizeSelect™ Gels (PN 4443471) [1]; SOLiD™ 2X25 Mate-Paired Library Construction Kit (PN 4443472); SOLiD™ Long Mate-Paired Library Construction Kit (PN 4443474); SOLiD™ Mate-Paired Library Oligos Kit (PN 4400468)			SOLiD™ System *de novo* accessory tools
	Targeted resequencing[5]	BloodPrep® DNA Chemistry for Cultured Cells and Blood (PN 4342775); SequalPrep™ Long PCR Kit with dNTPs (PN A10498); SequalPrep™ Normalization Plate (96) Kit (PN A10510-01)	SOLiD™ Fragment Library Construction Kit with SizeSelect™ Gels (PN 4443471)[1]; SOLiD™ Fragment Library Oligos Kit (PN 4401151)		SOLiD™ Opti Fragment Library Sequencing Master Mix 35 (PN 4442218); SOLiD™ Opti Fragment Library Sequencing Master Mix 50 (PN 4442236); SOLiD™ Opti Fragment Library Sequencing Kit-5 bp Barcode Set (PN 4442261); SOLiD™ Instrument Buffer Kit (PN 4406479); SOLiD™ Workflow Analysis Reagents (PN 4406463)	SOLiD™ Bioscope v1.0 Integrated Resequencing Pipeline

1. Sample preparation kits may vary based on source of material or on kit size. Visit **www.ambion.com** or **www.invitrogen.com** for more information on products and part number information.
2. Most items also available in mini-reaction kit format.
3. Internal controls available.
4. Whole transcriptome analysis of a single cell: application note and peer-reviewed publication. For more details, visit **solid.appliedbiosystems.com**.
5. Third-party targeted enrichment—Agilent SureSelect DNA Capture Array, Agilent SureSelect Targeted Enrichment System, and febit HybSelect Sequence Capture Solution.

Performance Specifications*

Library Type	Read Length	Days/Run	Total Tags/Run	Mappable Data	Mappable Data With Base Calls With QV≥30 (~80%)
Fragment	1 x 35 bp	3.5–4.5 days	500–600 M	15-20 GB	12-16 GB
	1 x 50 bp	6–7 days	500–600 M	25–30 GB	20–24 GB
Mate-Paired	2 x 35 bp	8–9 days	>1 B	30-40 GB	24-32 GB
	2 x 50 bp	12–14 days	>1 B	50–60 GB	40–48 GB

*Based on 2 slides/run.

System Workflow Hardware

Workflow Step	Library Preparation			Templated Bead Preparation	Sequencing		Data Analysis	System Updates
Instrumentation	Covaris™ S2 System[1] PN 4387833 (US), PN 4392718 (Intl) CE/NTL Marked	VWR® Compact Chiller[1] Supplied with Covaris™ S2 system	Hydroshear®[1] PN 4382889 (US), PN 4382890 (Intl) CE/UL Marked	IKA[1] PN 4400335 CE/UL Marked	SOLiD™ 3 Plus Analyzer[1] PN 4444317 CE/UL Marked	UPS[2] (recommended) PN 4397781 (US), PN 4393695 (Intl)	SOLiD™ Accessory Disk Drive PN 4426101 CE/UL Marked	SOLiD™ 3 Plus Kit PN 4444038 CE/UL Marked
System Components	System includes instrument, machine tube holders, fill level labels, and Dell® Latitude laptop computer	VWR® Compact Chiller, Model 117-612	Unit equipped with syringe, shearing control software, standard shearing assemblies, and tool kit assembly	Customized version of the ULTRA-TURRAX® Tube Drive for use for SOLiD™ System emulsion creations	Reagent delivery system includes keyboard, monitor, mouse, installation setup and accessories, computer system, and software suite v3.5	Two UPS units with output power capacity of 2100 W/3,000 VA	Additional MD1000 for on-instrument secondary analysis for larger genomes	Updates existing SOLiD™ 3 Analyzer to attain new specifications
Operating Environment: Temperature Humidity	15–32°C 80% at 31°C; 50% at 40°C	–10 to 40°C	15–40°C 20–80% at 40°C	5–40°C Up to 80%	15–24°C with no more than 2°C fluctuation in a 24 hr period 20–80% (non-condensing)	0–40°C Up to 95%	10–35°C 20–80% (non-condensing)	
Dimensions: Width x Depth x Height Weight	21 cm x 52 cm x 31 cm 13.6 kg	30.5 cm x 47 cm x 33 cm 28 kg	13 cm x 25.5 cm x 30.5 cm 4.5 kg	10 cm x 16 cm x 4 cm 0.75 kg	176 cm x 60 cm x 178 cm 373 kg	13 cm x 66 cm x 43.2 cm 55 kg	13.11 cm x 44.63 cm x 48.01 cm 35.37 kg	
Power Requirements:								
Nominal Voltage	120 V ± 10% (US); 100 V (Japan); 220–240 V (Intl)	120 V (US); 220 V (Intl)	110 V ± 10% (US); 220 V ± 10% (Intl)	100–240 V	200–240 V	Input and output— 208 V (US); 230 V (Intl)	100–240 V	
Current	2 A (US and Japan); 1 A (Intl)	7 A (US); 3.5 A (Intl)	15 A (US); 10 A (Intl)	0.8 A (input)	25 A (maximum)	Adjustable range for input voltage mains operation = 100–208 V	7.2 A (US); 3.6 A (Intl)	
Frequency	60 Hz ± 10% (US); 50–60 Hz (Japan and Intl)	60 Hz (US); 50 Hz (Intl)	50–60 Hz	50–60 Hz	50–60 Hz	50–60 Hz	47–63 Hz	
Power	300 W		300 W	20 W (input)	5,000 W (dissipation)	2100 W/3,000 VA	488 W maximum continuous; 550 W peak; 200 W (dissipation)	

Computer Requirements

Covaris™ S2 System[1]

- Hardware: Celeron 430, 1.73 GHz with 512 GB RAM
- Operating System: Microsoft® Windows® XP Professional, Service Pack 2
- Hard disk storage: 80 GB

SOLiD™ Accessory Disk Drive

- Dell® PowerVault™
- MD1000 with 15X 1 TB SATA hard disk (RAID-5 w/hot spare)

SOLiD™ 3 Plus Analyzer[1]

- Instrument Controller: Dell® PowerEdge™ 1950 with Intel® Xeon®, 8 GB RAM; Dual 250 GB SATA hard disks (RAID-1), Microsoft® Windows® XP Professional, Service Pack 2
- Head Node: Dell® PowerEdge™ R710 with Intel® Xeon®, 24 GB RAM, Six 1 TB SATA hard disks (RAID-5); 64-bit CentOS 4.7
- Compute Nodes: 3 Dell® PowerEdge™ R410 with Intel® Xeon®, 24 GB RAM, two 1 TB SATA hard disks (RAID-0)
- Storage: Dell® PowerVault™ MD1000 with 15X 1 TB SATA hard disk (RAID-5 w/hot spare)
- Gigabit Switch: Dell® PowerConnect™ 2816
- Power Distribution Units: APC switch rack PDU(2)

1. Included component of the SOLiD™ 3 Plus System (PN 4444315(110 V), PN 4444316 (220 V)).
2. Output connection: US=(2)NEMA L6-20R and (2)NEMA L6-30R; International=(8) IEC 320 C13, (2) IEC 320 C19, (3) IEC jumpers. Input Connections: US=NEMA L6-30P; International=British BS1363A, IEC-320 C20, and Schuko CEE 7/EU1-16P.

For Research Use Only. Not for use in diagnostic procedures.

B-088300 0909

Printed in the USA.

applied biosystems™
part of life technologies™

Headquarters
850 Lincoln Centre Drive | Foster City, CA 94404 USA
Phone 650.638.5800 | Toll Free 800.327.3002
www.appliedbiosystems.com

International Sales
For our office locations please call the division headquarters or refer to our Web site at
www.appliedbiosystems.com/about/offices.cfm