



**Spark Holland introduces
DBS Autosampler™**

A revolution in
Dried Blood Spot (DBS) Sampling

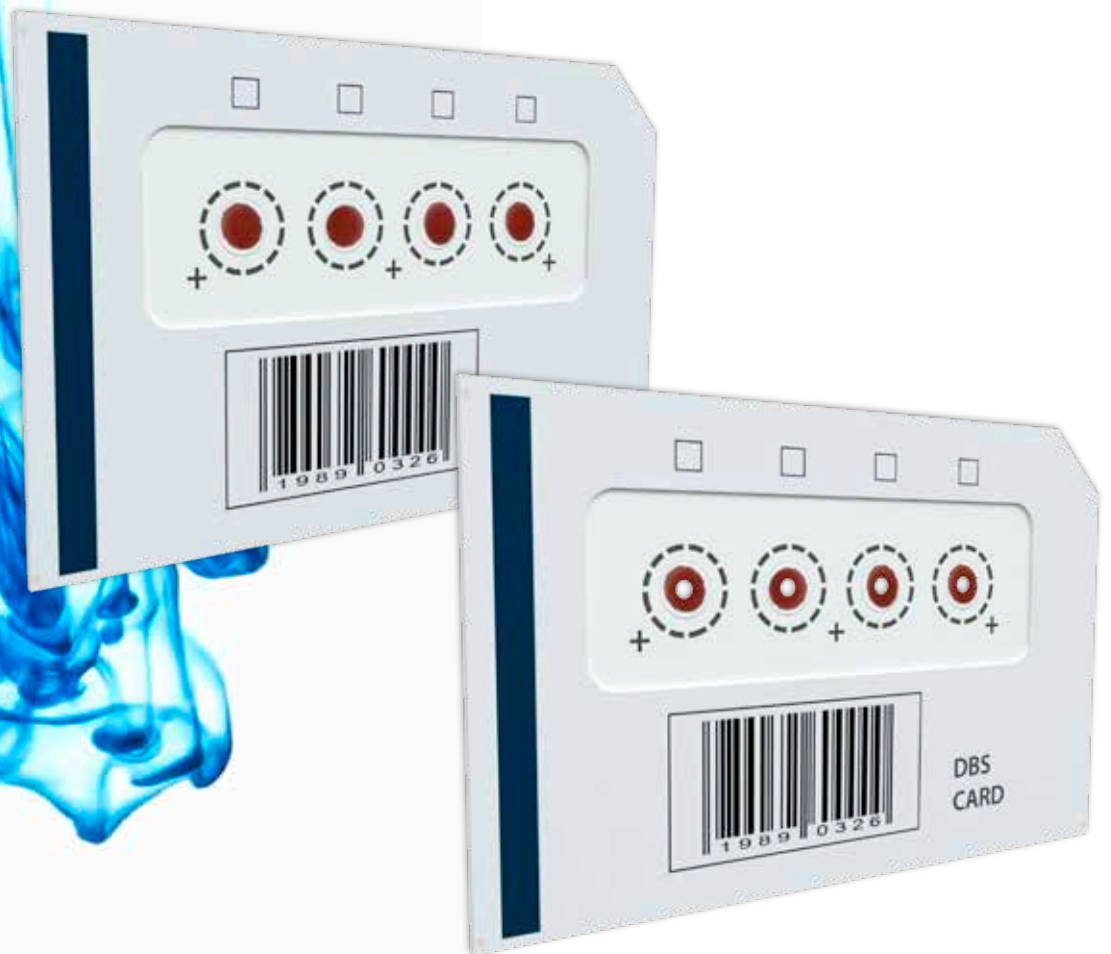
BETTER **SAMPLE** CARE

**Spark Holland introduces
DBS Autosampler™**

A revolution in
Dried Blood Spot Sampling

The DBS Autosampler™

Farewell to Punching!
Using a leak-tight clamp, dried blood spots or dried matrix spots are directly desorbed as a liquid sample for analysis. Enables a completely automated workflow for DBS analysis.




On the spot sampling

Dried blood spot (DBS) sampling is an emerging technology for bioanalysis, offering easy, convenient cost effective sample collection, transport and storage. It also offers the possibility for patients who require regular monitoring to take their own blood samples in the comfort of their own home, saving patient stress, transport costs, clinic resources and provides a convenient sampling option in remote locations where medical facilities are not readily available.

DBS or Dried Matrix sampling is particularly useful in the clinical and pharmaceutical laboratory, typically requiring only a 5-15 μ L blood sample.

However, all the convenience of DBS disappears if you have a complex, labor-intensive process converting the DBS sample to a liquid sample for analysis!

Our revolutionary DBS Autosampler™ maintains the integrity of the sample through automation, offering more efficient, cost effective DBS sample processing.



**Jack Guthree at home
with automated
on the spot sampling**

**Introducing our revolutionary
DBS Autosampler™**

Introducing our revolutionary **DBS Autosampler™**

Our new DBS Autosampler™ maintains the integrity of the sample by automation. A small footprint enables the DBS Autosampler™ to slot into even the smallest lab space. A standard robotic card feeder and full software control and interface can link into any workflow automation. An optimized workflow solution!

- Unique Flow-through desorption (FTD™) technology for sample prep and optional on-line coupling to (SPE)(LC)-MS/MS
- Option for mounting different clamp sizes for the desorption of different sized spots
 - Partial spot or full spot desorption
- Intelligent camera and image analysis software for
 - accurate spot recognition and positioning
 - "no card" detection and detection of previously sampled spots
 - barcode identification for 1D and 2D barcodes
 - storage, tracking and tracing of sample information
 - sample card information storage
- Automated internal standard addition (AISA™)
- HotCap™ heated capillary for better desorption
- Wash flow path with solvents and/or HotCap™
- Sparklink™ 5 software control and interface
- Standard 96 DBS card capacity
 - 4 sample spots per card allows possibility of 384 samples
- Excellent sensitivity with a variety of analytes
- Good precision, linearity and accuracy with a variety of analytes
- Total assay cycle time for DBS-SPE-LC-MS analysis within 3 minutes

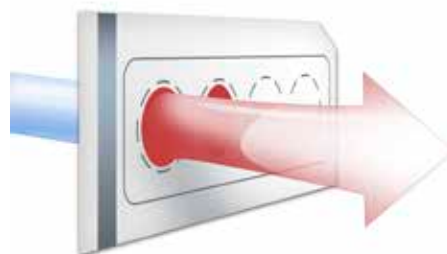


Patented technology

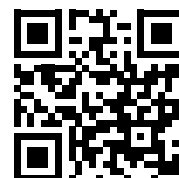
Innovative patented Flow-through desorption (FTD™)* technology provides direct elution of DBS from cards, offering not only consistent quality while eliminating the inconsistency of tedious manual disc punching or costly robotics, but also allowing the option of on-line clean-up and analyte separation by SPE prior to analysis in an automated workflow. Effortless automation of the entire workflow for DBS analysis in minutes, providing maximum

sensitivity without any manual intervention. The DBS Autosampler™ from Spark sets a new standard for analysis!

- No disc punching
- Simple, automated process
- Potential for many applications



www.onthespotsampling.com



* US patent no. US 8586382 B2

Extended sample capacity

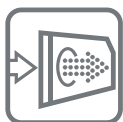
Flexible Card Feed

Expandable capacity – from a single card, to a 96 card feeder. 4 sample spots per card allows the possibility of 384 samples for analysis in a single run.



On the spot sample preparation

Spark has always led the way in the innovative integration of sample prep into on-line analysis. Innovative features and our unique patented technology to ensure the integrity of your DBS samples is maintained for whatever analytical technique you choose.



Flow-Through Desorption

FTD™ – Flow-through Desorption

No manual intervention required with our innovative patented technology. Direct elution of DBS from cards enables optional on-line clean-up and analyte separation by SPE prior to analysis in an automated workflow. Replaceable clamp head sizes of 2, 4, 6 or 8 mm clamp and seal filter paper cards up to pressures of about 200 bar (up to 100 bar for the 8 mm clamp). Desorption solvent is delivered by a high pressure dispenser (HPD™).

that it not only provides accurate positioning of DBS cards in the high pressure clamp for direct, flow-through desorption of bloodspots; but also offers sample barcode identification for 1D or 2D barcodes, full or partial spot desorption options and full image capture for sample information storage, tracking and traceability.



Intelligent Vision Camera

IVC™ – Intelligent Vision Camera

Accurate spot positioning and sample traceability is vital for accuracy. Our camera has been designed so



Automated Internal Standard Addition

AISA™ – Automated Internal Standard Addition

Accurate automated internal standard addition using a loop injection method. A specified volume of internal standard is loaded in a loop using an integrated mini pump. The internal standard is then added to the sample during desorption of a blood spot using a high pressure dispenser (HPD™).



Heated Capillary

HotCap™ – individual heating of solvents

HotCap™ is an optional heated capillary that rapidly heats solvents to improve desorption and sample recovery.

Connecting to the world

Sparklink™ 5 control

For comprehensive control of the extensive capabilities of the DBS Autosampler™ Spark has developed the Sparklink™ 5 control software package. The software package consists of the main Sparklink™ controller and the DBS Autosampler™ driver software. The software provides maximum use of the functionality in any order of events and to customize your own methods. Methods are linked to samples in a run table for automated processing of sample batches. Software synchronization and hard-wired I/O enable communication with other software and hardware to create full control for your entire analytical system.

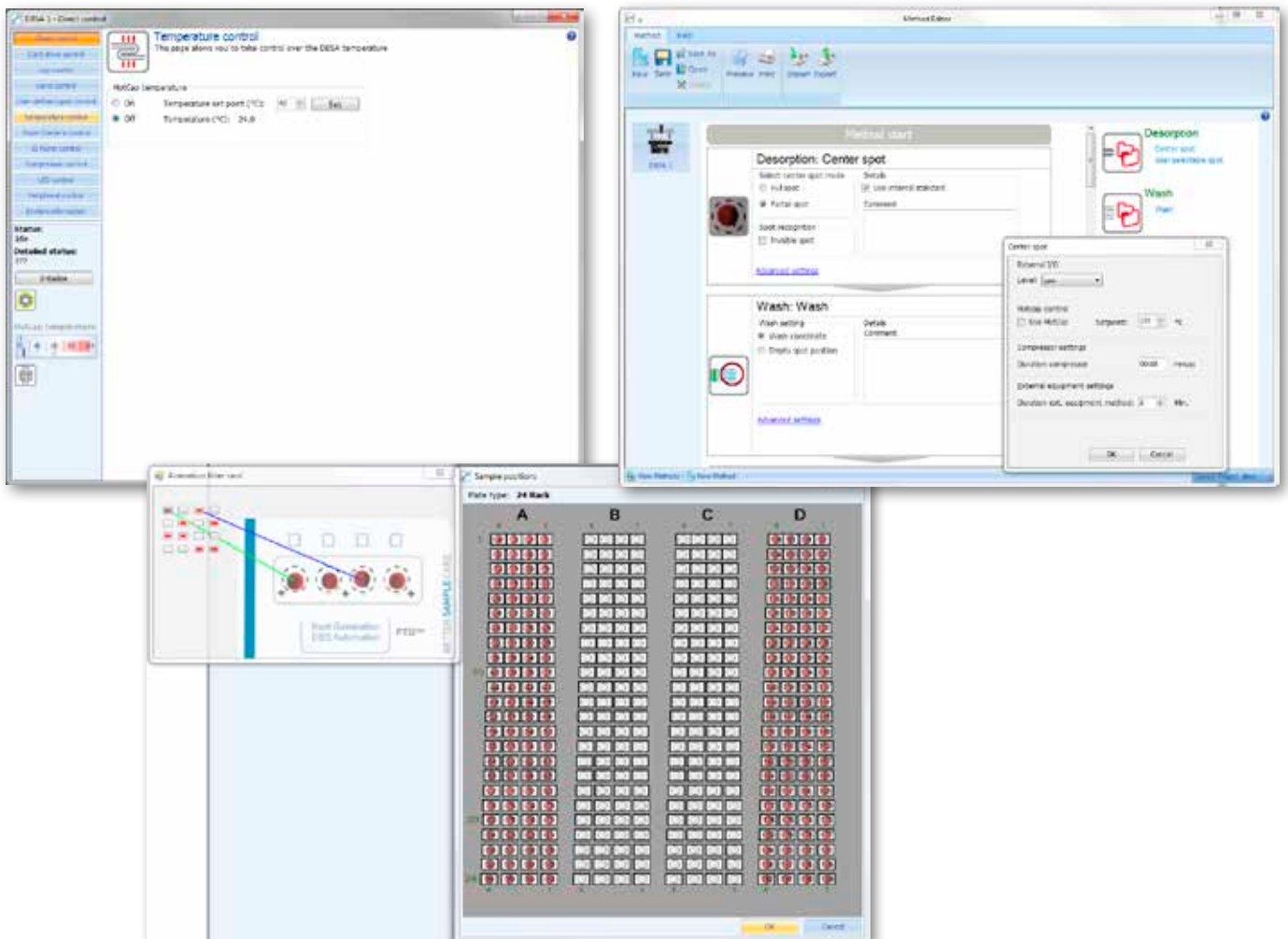
Manual control mode allows full choice and customization of parameters such as clamp size, sample position, full or partial spot, card feed, valve, temperature, camera and internal standard.

Once all parameters have been selected, the run table can be viewed prior to the run.

Drivers for third party software packages / OEM solutions

Using the Spark communication protocol, Sparklink™ control can be integrated into most third party software packages. Spark has extensive experience with integrating instrument control into the software packages of our OEM customers, and has assisted in the

creation of a number of drivers for our instruments in commercially available software products for system control and data acquisition. Please consult us for your workflow solution!





MSDS - SparkLine

Project: MSDS Runtable Queue View Control Logviewer Help

Runtable

Method	Result File	Sample ID	Card rank	Pin used	Spot position
default decap	Decal01	801	A	01	01
default decap	Decal02	802	A	01	02
default decap	Decal03	803	A	01	03
default decap	Decal04	804	A	01	04
default decap	Decal05	805	A	02	01
default decap	Decal06	806	A	02	02
default decap	Decal07	807	A	02	03
default decap	Decal08	808	A	02	04
default decap	Decal09	809	A	03	01
default decap	Decal10	810	A	03	02
default decap	Decal11	811	A	03	03
default decap	Decal12	812	A	03	04
default decap	Decal13	813	A	04	01
default decap	Decal14	814	A	04	02
default decap	Decal15	815	A	04	03
default decap	Decal16	816	A	04	04
default decap	Decal17	817	A	05	01
default decap	Decal18	818	A	05	02
default decap	Decal19	819	A	05	03
default decap	Decal20	820	A	05	04
default decap	Decal21	821	A	06	01
default decap	Decal22	822	A	06	02
default decap	Decal23	823	A	06	03
default decap	Decal24	824	A	06	04
default decap	Decal25	825	A	07	01
default decap	Decal26	826	A	07	02
default decap	Decal27	827	A	07	03
default decap	Decal28	828	A	07	04
default decap	Decal29	829	A	08	01
default decap	Decal30	830	A	08	02
default decap	Decal31	831	A	08	03
default decap	Decal32	832	A	08	04
default decap	Decal33	833	A	09	01
default decap	Decal34	834	A	09	02
default decap	Decal35	835	A	09	03
default decap	Decal36	836	A	09	04
default decap	Decal37	837	A	10	01
default decap	Decal38	838	A	10	02
default decap	Decal39	839	A	10	03
default decap	Decal40	840	A	10	04

View Runtable Runtable Queue

MSDS - SparkLine

Project: MSDS Runtable Queue View Control Logviewer Help

Runtable

Status	Method	Result File	Sample ID	Card rank	Pin used	Spot position
Running	default decap	Decal01-201	801	A	01	01
Running	default decap	Decal02-201	802	A	01	02
Running	default decap	Decal03-201	803	A	01	03
Running	default decap	Decal04-201	804	A	01	04
Running	default decap	Decal05	805	A	02	01
Running	default decap	Decal06	806	A	02	02
Running	default decap	Decal07	807	A	02	03
Running	default decap	Decal08	808	A	02	04
Running	default decap	Decal09	809	A	03	01
Running	default decap	Decal10	810	A	03	02
Running	default decap	Decal11	811	A	03	03
Running	default decap	Decal12	812	A	03	04
Running	default decap	Decal13	813	A	04	01
Running	default decap	Decal14	814	A	04	02
Running	default decap	Decal15	815	A	04	03
Running	default decap	Decal16	816	A	04	04
Running	default decap	Decal17	817	A	05	01
Running	default decap	Decal18	818	A	05	02
Running	default decap	Decal19	819	A	05	03
Running	default decap	Decal20	820	A	05	04
Running	default decap	Decal21	821	A	06	01
Running	default decap	Decal22	822	A	06	02
Running	default decap	Decal23	823	A	06	03
Running	default decap	Decal24	824	A	06	04
Running	default decap	Decal25	825	A	07	01
Running	default decap	Decal26	826	A	07	02
Running	default decap	Decal27	827	A	07	03
Running	default decap	Decal28	828	A	07	04
Running	default decap	Decal29	829	A	08	01
Running	default decap	Decal30	830	A	08	02
Running	default decap	Decal31	831	A	08	03
Running	default decap	Decal32	832	A	08	04
Running	default decap	Decal33	833	A	09	01
Running	default decap	Decal34	834	A	09	02
Running	default decap	Decal35	835	A	09	03
Running	default decap	Decal36	836	A	09	04
Running	default decap	Decal37	837	A	10	01
Running	default decap	Decal38	838	A	10	02
Running	default decap	Decal39	839	A	10	03
Running	default decap	Decal40	840	A	10	04
Running	default decap	Decal41	841	A	11	01
Running	default decap	Decal42	842	A	11	02
Running	default decap	Decal43	843	A	11	03
Running	default decap	Decal44	844	A	11	04

View Runtable Runtable Queue

Instrument Status

DS611

Status: Running

default decap 20141217 13:03:43 0101 0101.jpg

default decap 20141217 13:03:43 0101 0201.jpg



OEM Solutions

Spark Holland has over 30 years' experience in HPLC and UHPLC instrument innovation, specializing in the field of autosampling, on-line solid phase extraction and, more recently, on-line dried blood spot (DBS) analysis. Our innovative products have always led the way in injection technology, sample preparation integration and flexibility of operation. Combined with high quality engineering and manufacturing, Spark Holland is a leading OEM supplier of front-end UHPLC and on-line solid phase extraction instruments, working according to ISO 13485 and, when required, delivering CE-IVD compliant modules for use in clinical systems.

Interested in seeing more? Interested in OEM?

Contact us now!

sales@sparkholland.com

www.sparkholland.com

DBS Autosampler™ specifications

General specifications	
Flow-through desorption concept (FTD™)	Leak-tight clamp heads provide direct elution of DBS from cards without punching discs.
Desorption methods	Partial spot, full spot.
Clamp heads	Replaceable. Sizes (2 mm, 4 mm, 6 mm and 8 mm available). SS316. Leak-tight up to 200 bar for 2 mm, 4 mm and 6 mm clamp heads. Leak-tight up to 100 bar for 8 mm clamp head. Programmable clamping force 300 – 3000 N.
Sample capacity	4 spot Whatman or PerkinElmer type DBS card in a cassette format, with an extended capacity of up to 96 DBS cards, or 384 samples.
Intelligent Vision Camera (IVC™)	Camera designed to provide <ul style="list-style-type: none"> - missing card detection - accurate positioning of DBS cards in the clamp - 1D and 2D sample barcode identification - full or partial spot desorption options - full image capture for sample information storage, tracking and traceability.
Internal standard loop	20 ul.
IS pump	Internal standard pump max. 95 µL/sec.
Compressor	To dry fluid lines and clamp heads after desorption and wash.
Clamp positioning precision	0.2 mm.
Injection valve	SS stator and PEEK rotor seal, bore 0.25 mm, 1/16" connection ports, except port 4 (1/32" connection port).
Valve switching time	<100 msec.
Reproducibility desorption	RSD ≤ 1%; Due to paper quality larger values are typically obtained.
Reproducibility internal standard	RSD ≤ 1%.
Cycle time, typical using HPD™	150 sec including desorption and wash.
Cycle time, from card retrieval to ready to desorb	20 sec.
Wetted parts in sample flow path	SS316, PTFE, PEEK.
Wetted parts in dispenser and wash lines	Tefzel, Teflon, PEEK, Kelf, Glass.

Safety and compliancy	
Regulatory compliance	CE, RoHS, FCC, ICES-01.
Safety standards applied	IEC61010-1, IEC61010-2-081 and IEC61010-2-010.
EMC standards applied	IEC61326-1, CISPR11, 47 CFR part 15.
Installation class	II.
Certification	UL and CSA approved.
Pollution degree	2.
Spark Quality System	ISO 9001 certified and ISO 13485 certified.
Clamp illumination LED	White LED with on/off control.
Door sensor	Door open status.

Electrical

Power requirements	100 – 240 Volt AC +/- 10%. 50/60 Hz.
Fuses	2 x 2.5 AT, 250V, 1500A breaking capacity, IEC 60127-2, UL recognized.
Power consumption	200 VA.

Environment

Operating environment	Indoor use only.
Sound pressure level	LAeq <70 dB.
Operating temperature	10 °C to 40 °C.
Operating humidity	20 to 80% RH.
Operating altitude	up to 2000 m.
Transport and storage temperature	-30 °C to +60 °C.
Transport and storage humidity	Max. 85% RH.

Physical

Max load on top cover	50 kg.
Dimensions Standard DBSA Module Standard DBSA Module + XYZ Card Handler Robot	(Width x Depth x Height). 330 mm x 540 mm x 120 mm. 535 mm x 540 mm x 698 mm.
Free area around the instrument	Minimum free distance of 5 cm from obstacles at the rear side.
Weight Standard DBSA Module Standard DBSA Module + XYZ Card Handler Robot	15 kg. 32 kg.

Instrument control

Graphical User Interface	SparkLink™ or third party instrument control software using SparkLink™ communication protocol, including DBS Autosampler™ driver.
PC interface	To be used with the SparkLink™ protocol: Serial, RS232 Sub-D connector Ethernet, RJ45 USB, type B. To be used for the Vision Camera: USB, type B.
Card handler	To be used for the connection with the card handler: Serial, RS232 Sub-D connector.
Outputs	5 programmable relay outputs. 1 programmable TTL output. Programmable as: Inject marker, Auxiliary or Alarm, Relays are NO and NC connectable. Outputs can be used for hardware synchronization.
Inputs	4 TTL inputs for OEM applications. Inputs can be used for hardware synchronization.

HotCap™	
Temperature range	40 – 100 °C. Hardwired temperature limiter, temperature measured at the HotCap™.
Increments	1 °C.
Accuracy	+/- 2 °C.
Speed	34 sec from 25 °C to 75 °C at 1ml/min using water.

Ordering information

DBS Autosampler™	
DBS Autosampler™ with 2 mm clampheads	SP411.102
DBS Autosampler™ with 4 mm clampheads	SP411.104
DBS Autosampler™ with 6 mm clampheads	SP411.106
DBS Autosampler™ with 8 mm clampheads	SP411.108
The DBS Autosampler™ order numbers come standard with these items: <ul style="list-style-type: none"> - HotCap™ - XYZ sampler - DBS Module - DBS Module Shipkit - XYZ Card Handler Kit - Connection plate DBS Autosampler Module and the XYZ sampler - Card rack carrier for 4 card racks - 4 # card racks - Card gripper - Sparklink™ Software - IS bottle holder 	

All products are for Research Use Only (RUO), unless specifically labeled otherwise.



For more information:



Now interactively explore for yourself all the animated features of the DBS Autosampler™ at www.onthespotsampling.com

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Specifications are subject to change

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