scap

System DBS

Dried Blood Spot

Automated sample extraction platform for online LC-MS/MS bioanalysis

LEAP TECHNOLOGIES

Patent pending

DBS Integrated Sample Processing

SCAP DBS system components mounted on a robotic platform

Automated sample processing

The dried blood spot (DBS) technology coupled to highly sensitive LC-MS/MS systems opens up new ways in bioanalytics both in the healthcare and the pharmaceutical industry. In the healthcare industry, complete measurements are done to diagnose patients to determine the efficacy of administrated drugs or to screen for early detection of desires. In the pharmaceutical industry, measurements are done during the development process of new drugs (e.g. PK/TK studies, etc.)

The major drawback of conventional DBS bioanalytics is the time consuming, error prone and labor intensive nature of manual sample pre-treatment. The SCAP DBS system from Prolab GmbH represents a unique approach for direct and automated DBS analysis and eliminates the drawback of current methods. The SCAP DBS system fully automates the DBS cards handling and allows online sample extraction without the need for punching of DBS cards.

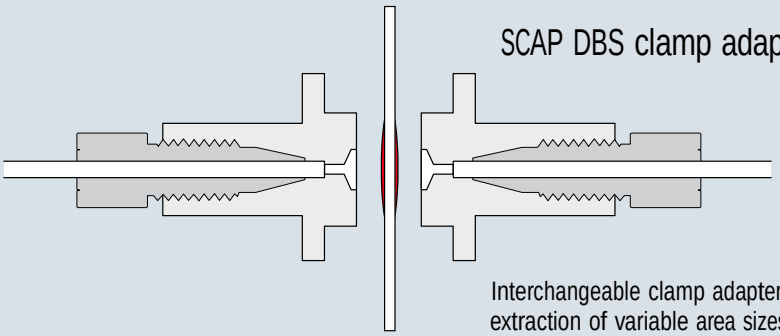
Conventional DBS workflow:	SCAP DBS system procedure
Preparing logistics and consumables for offline DBS sample handling.	Load DBS card into SCAP DBS system and start automated process
Punching out DBS cards	
Pipetting of extraction solvent(s) and internal standard	
Extraction / Shaking – Ultra sonic treatment	
Centrifugation / Filtration	
Injection into HPLC - System	Injection into SCAP HPLC - System

Comparison of conventional DBS sample handling with the SCAP DBS system

Advantages

- Fully automated SCAP DBS system sample card handling for LC/MS-MS analysis
- Optimized extraction of DBS
- Simplified method development by online extraction
- Fully automated process saves time and labor costs
- No need for additional consumables

SCAP DBS clamp adapters



Interchangeable clamp adapters allow the extraction of variable area sizes from the DBS

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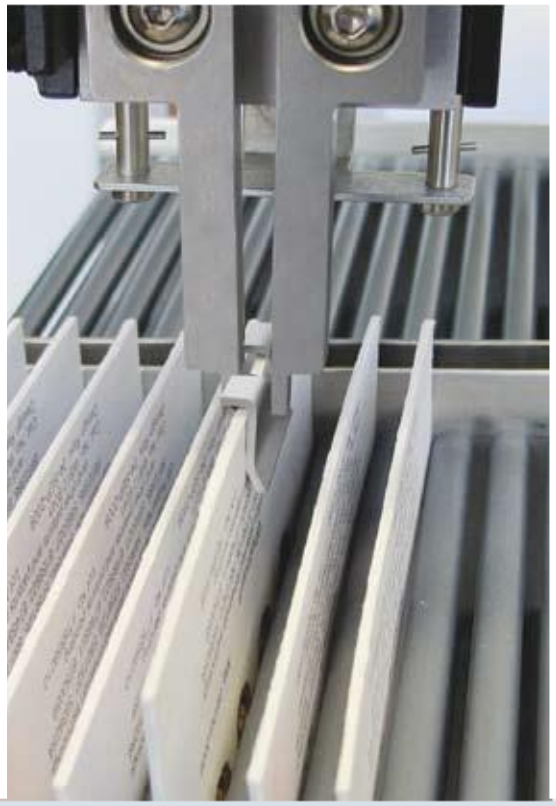
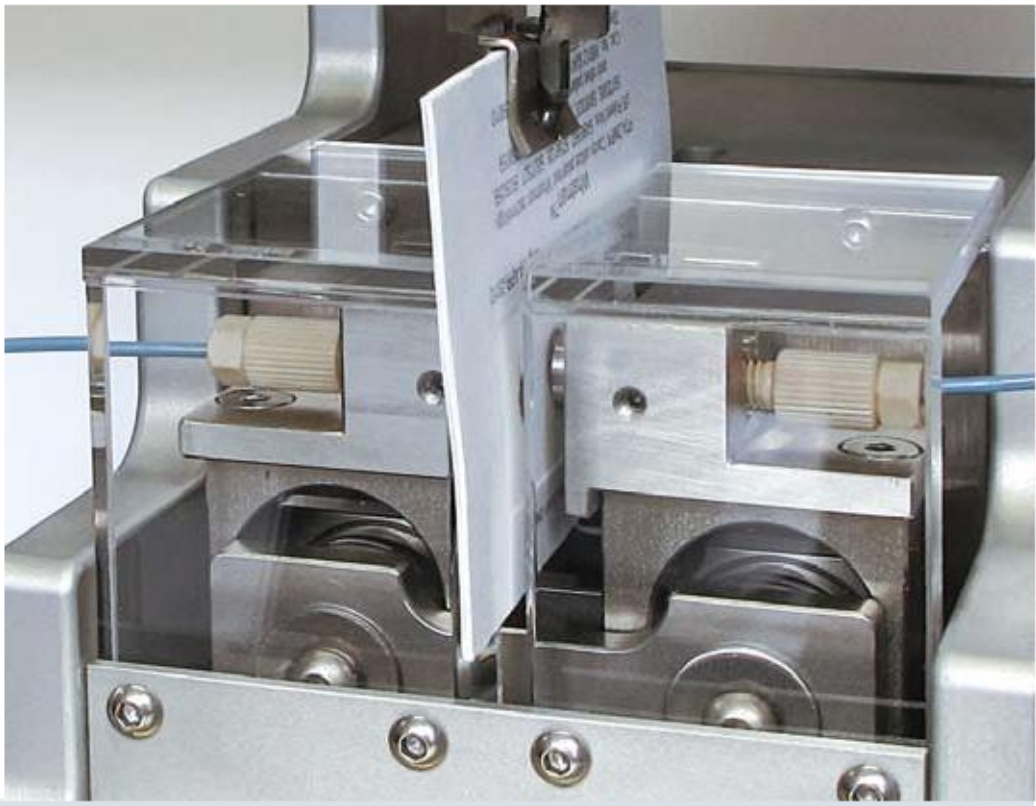
Efficient SCAP DBS Workflow



SCAP DBS system robotic gripper tool picks up DBS card ...

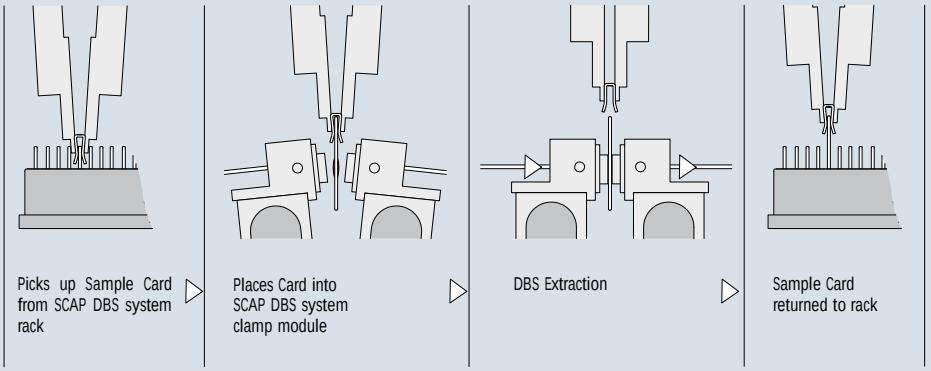


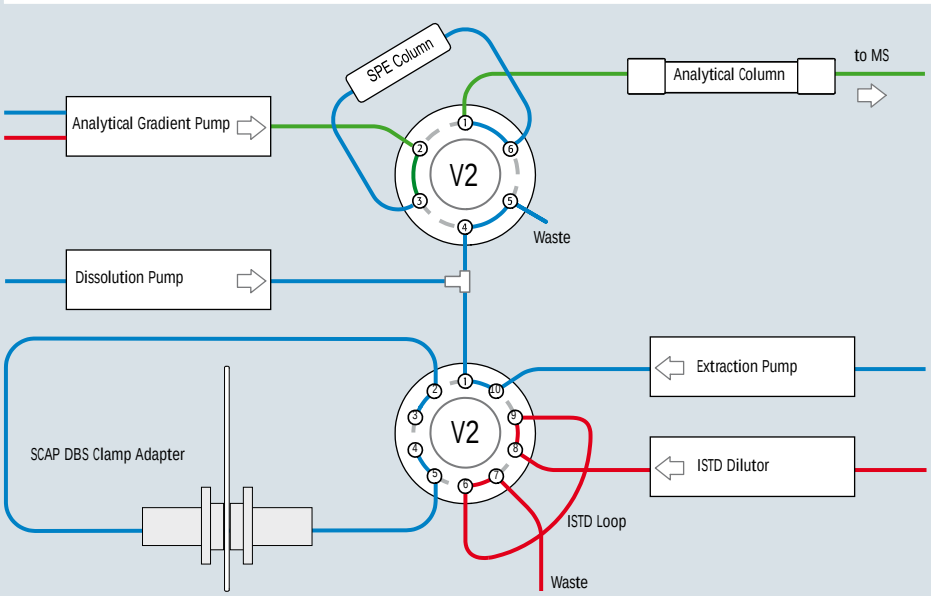
...and places it into the DBS SCAP system clamp module where the DBS card is implemented into the analytical flow

SCAP DBS sample process

The DBS rack with the DBS cards is placed into the SCAP DBS system. According to the sample queue the robotic arm transfers the card into the clamp module where the DBS card is integrated into the HPLC flow path for online extraction without punching of DBS cards. The different adapters available for the SCAP DBS system allow extracting different areas of the DBS and seal the DBS card by applying up to 200 bars.

The valve system configuration allows the on-line addition of internal standard (ISTD) during sample extraction. A SPE pre column is used for online sample cleanup prior to analytical separation on the main column.



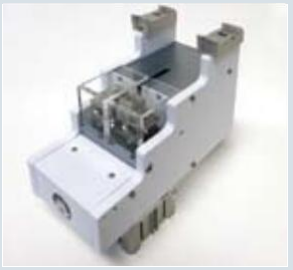


Dual valve application example

Valve switching configuration with a six and a ten port valve

System Configuration

Basic SCAP DBS system consists of:
SCAP DBS clamp module
SCAP DBS gripper
SCAP DBS dilutor
Valve Drive module
Valves & drives
SCAP DBS dual tray
SCAP DBS rack
SCAP DBS Starter Kit

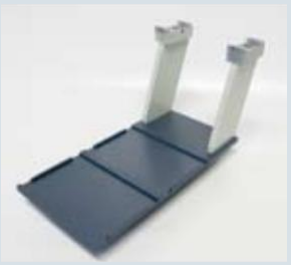

SCAP Clamp Mechanism

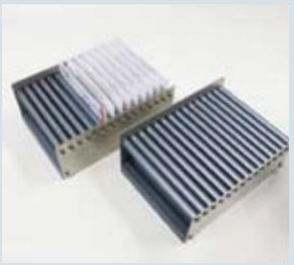

SCAP DBS system gripper


SCAP DBS system dilutor

SCAP DBS Accessories:
SCAP DBS rack
SCAP DBS clamp adapters
d.1.5/ d.2/ d.2.5/ d.3.2/ d.4.0/ d.5.0


Valve module


SCAP DBS system dual tray


SCAP DBS system rack


SCAP DBS system clamp adapters

SCAP PAL Configuration
The following LEAP CTC Analytics SCAP PAL components are required to operate a SCAP DBS system

PAL HTC9-xt	PAL50 instrument (one DBS dual tray)
PAL HTS9-xt	PAL80 instrument (three DBS dual trays)
PAL HTX9-xt	PAL120 instrument (five DBS dual trays)

PAL 1, 2, 3 Valve Drive (Serial Valve drives)
with six port or ten port valve (depending on your application)

Cycle composer with macro editor
Other software under review

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