

Agilent Automated Card Extraction Dried Blood Spot LC/MS System

Technical Reference Guide

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Installation

Cable Connections

For all systems, make sure that the system components are connected as indicated in [Figure 1](#). To use MassHunter to start data acquisition, additionally connect cables as shown in [Figure 2](#). Otherwise, additionally connect cables as shown in [Figure 3](#).

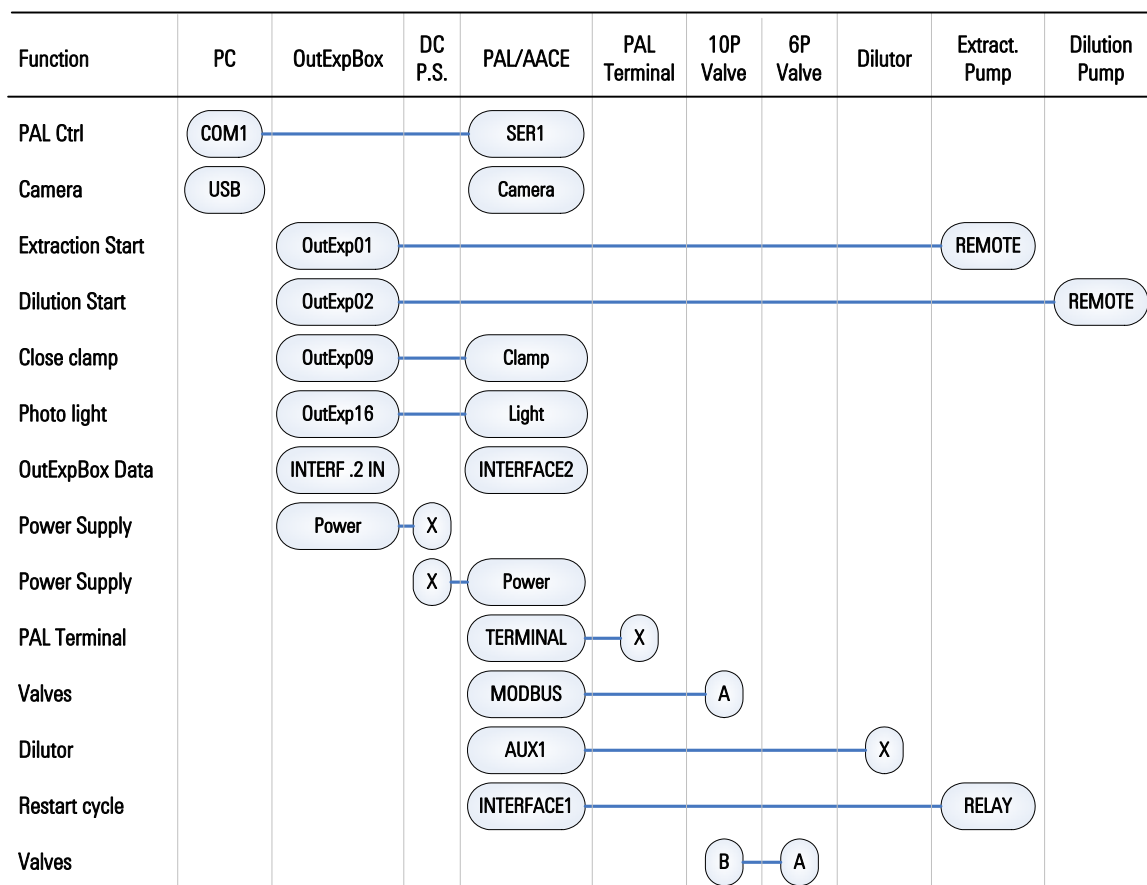


Figure 1 Cable connection for all setups.

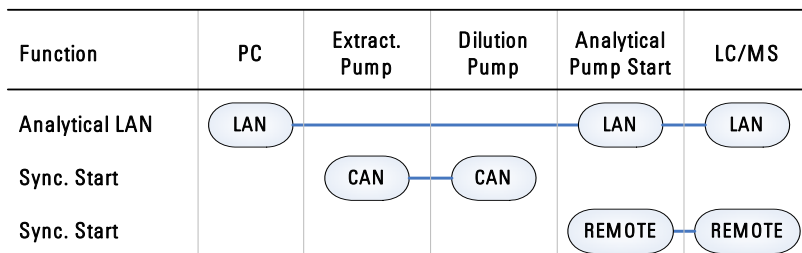


Figure 2 Cable connections in addition to those in [Figure 1](#) when MassHunter is used to start data acquisition.

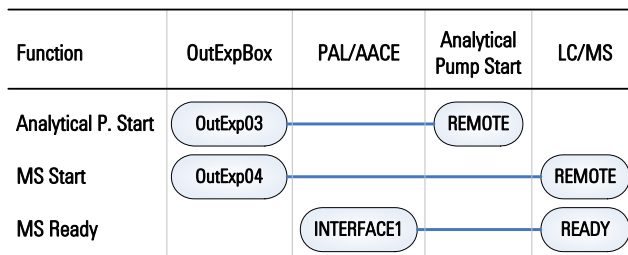


Figure 3 Cable connections in addition to those in [Figure 1](#) when data acquisition is controlled by cable contacts.

PAL Configuration

This section explains how to configure the PAL autosampler that is part of the Agilent Automated Card Extraction Dried Blood Spot LC/MS (AACE DBS LC/MS) system.

Configure the following objects using a PAL backup file supplied by Prolab Instruments. You must calibrate the positions of objects marked with * for each new installation. Other object names do not need adjustment, and are only listed here for the sake of completeness.

Refer to the PAL documentation to learn how to teach objects.



Figure 4 Camera location

Positions

- Home (basic position)
= X: 0.0, Y: 0.0, Z: 0.0
- Home2 (nearby basic position for internal use)
= X: 0.1, Y: 0.0, Z: 0.0
- Picture (the position in which a card is maneuvered to take a picture of it)
= X: 170.0, Y: 70.0, Z: 86.0
- DBSrefA* (reference position for the clamp module)



Figure 5 Position the gripper on the calibration metal plate of the clamp module

If the DBS card extraction marks experiences an alignment error, you can change the X and Z components of the DBSrefA position to compensate for the error. Make sure that you reload the PAL configuration in the SCAP software after making any changes to the PAL configuration. See “Changing/Moving PAL Objects” on page 14.

PAL Configuration

Tray Types

- DBSout* (for internal use)
= DBSrefA + (X: -116.0, Y: 21.0, Z: -55.0)
- DBSout2* (nearby DBSout; for internal use)
= DBSrefA + (X: -116.1, Y: 21.0, Z: -55.0)

Tray Types

- DBS40 (the standard tray with a capacity of 40 Auto DBS cards)

Tray Holders

- Rack-40* (lower tray holder for two trays of type DBS40)

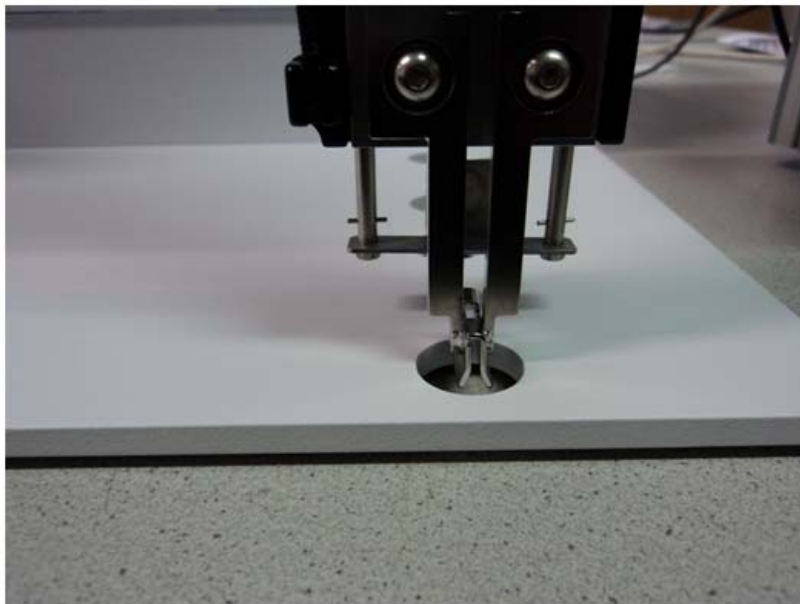


Figure 6 Positions for calibration

Positions for calibration are the front/right holes in the upper (and respectively lower) tray holder. X/Y should be adjusted in the center of the hole, while Z is determined by leveling the gripper's lower edge to the tray holder's surround surface.

- Stack-40* (upper tray holder (drawer) for two trays of type DBS40)



Figure 7 Positions for calibration

Positions for calibration are the front/right holes in the upper (and respectively lower) tray holder. Adjust X/Y in the center of the hole, and determine Z by leveling the gripper's lower edge to the tray holder's surround surface.

Trays

- Tray40-1 (low front) (*)
- Tray40-2 (low rear) (*)
- Tray40-3 (up front) (*)
- Tray40-4 (up rear) (*)

Although the tray's positions are already indirectly defined by the position of the tray holders, verify and fine-tune (if needed) the tray's positions by using the "Check Pos" and "Movto 40" commands of the PAL handheld terminal. Place DBS cards in the first and in the last positions of all trays.

Make sure that the distance between the left edge of a card and the right edge of the gripper is 64 mm. Adjust the Y correction if needed. See [Figure 8](#).



Figure 8 Y adjustment for Tray

Serial Valves

- DBS-10P (10-port valve)
- DBS-6P-1 (1st 6-port valve)
- DBS-6P-2 (2nd 6-port valve, only in case of a configuration with 3 valves)

Dilutors

- Dilutor (the PAL's syringe pump)

Creating Cycles

If you installed the SCAP DBS software, including the Cycle Editor (“Advanced users” option in the installer), you can use the Cycle Editor to create your own cycles. To start the Cycle Editor, click **Start > All Programs > SCAP > SCAP Cycle Editor**.

All cycles must be saved in **user\Documents\SCAP\PAL-Data**. Once saved, they are available as a basis for creating methods (see the *Agilent Automated Card Extraction Dried Blood Spot LC/MS System SCAP DBS Software Users Guide*).

For the semantics of the atoms, please refer to the Technical Note *Syntax for PAL Remote Control Commands* from CTC Analytics.

SCAP-specific atoms

In addition to the standard atoms provided by CTC, there are some atoms which are interpreted by the SCAP DBS software only, to provide some of the functionality unique to the AACE DBS LC/MS system. In order to remain compatible with the CTC original cycle syntax and editor tools, these atoms are embedded within a standard atom called LABEL. In order to insert one of these atoms in a cycle, select the LABEL atom in the Cycle Editor, and enter the name of the intended special atom as the value of its Name parameter.

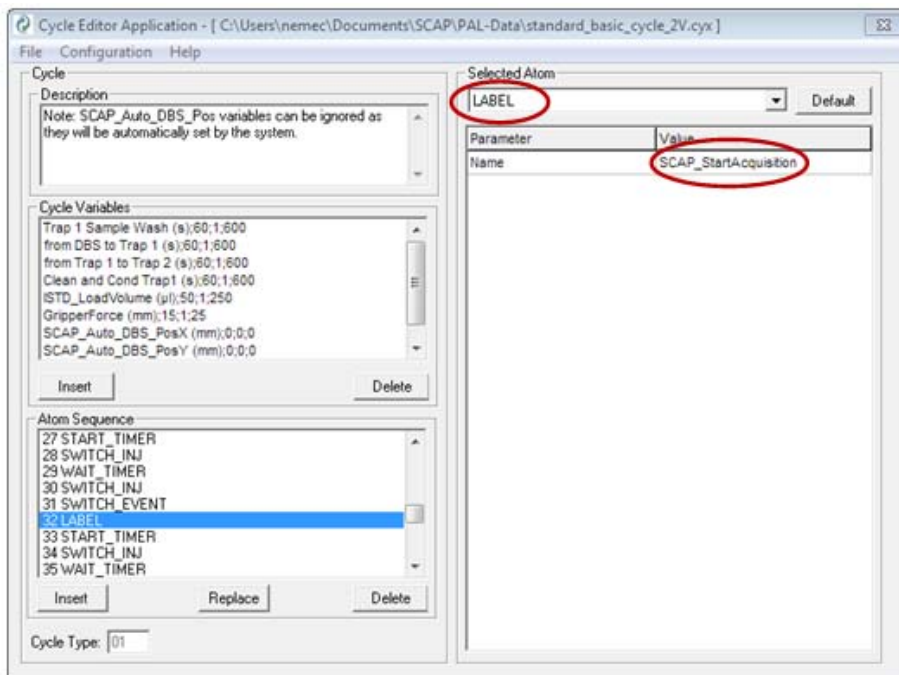


Figure 9 LABEL atom

SCAP_TakePictureNow

This special atom triggers a picture from the AACE DBS LC/MS system camera.

This atom can occur up to two times in one cycle. The first occurrence in a cycle is treated as the PRE Picture of a sample run, and the second one is treated as the POST Picture.

SCAP_TakePictureStart and SCAP_TakePictureEnd

If a method run is started with PRE Picture option in the sample list editor disabled, all atoms between the first occurrences of TakePictureStart and TakePictureEnd are ignored. Similarly, all atoms between the second occurrences of these special atoms are ignored in case the POST Picture is not selected. In case of enabled picture options, these special atoms are ignored.

SCAP_StartAcquisition

The action carried out for this atom depends on the settings for Data Acquisition Control:

- If **Via MassHunter software** integration is selected:
 - If a MassHunter worklist is (still) running, the current sample run is aborted.
 - Otherwise, the data acquisition is started using MassHunter.
- If **Via cable contacts** is selected, this atom is replaced by the two other atoms:
 - LABEL(SCAP_CheckEvent,<AcqReadyIn>) (for definition, see “SCAP_CheckEvent” on page 12) to check the configured input for a ready signal and to abort the sample run in the absence of a ready signal. This check is omitted in case that no ready input signal was configured.
 - In case the ready signal was present, SWITCH_EVENT(<AcqStartOut>,On,1000) is used to start the data acquisition

SCAP_CheckEvent

This special atom uses the standard atom WAIT_EVENT(<EventName>,On,) to wait for the specified input signal. In case the signal is active, this atom returns immediately, and the sample run continues normally. In the absence of the signal, WAIT_EVENT is interrupted after 2 seconds of waiting, and the current sample run is aborted, giving the abort reason “event check failed”.

Note: This special atom was introduced to implement SCAP_StartAcquisition in case a ready signal via cable is used, but it can be used directly like any other atom.

Special Variables

SCAP_Auto_DBS_PosX, SCAP_Auto_DBS_PosY, and SCAP_Auto_DBS_PosZ

When these special variables are used in a cycle, the values specified in the method are ignored and overwritten by the actual position of the center of the blood spot addressed by the current sample run, either determined using image analysis or derived from the card type.

Maintenance

Replacing the Camera

Windows assigns a new COM port number to every new camera, so if the camera hardware is replaced, adjust the COM port in the dialog.

Recalibrate the camera after replacement. To do this, right-click the mouse in the status bar at the bottom of the main window, and select **Recalibrate Camera**. This option is not available unless the PAL and the camera are connected.

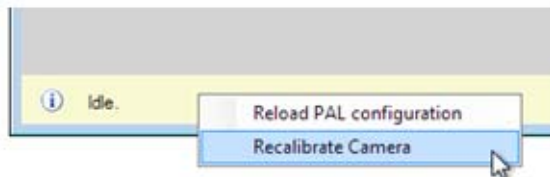


Figure 10 Recalibrate Camera

Changing/Moving PAL Objects

If any of the PAL components were physically moved or if trays were added or removed, the SCAP DBS software has to learn the new positions or object definitions from the PAL (see Positions). To do this, right-click the mouse in the status bar at the bottom of the main window, and select **Reload PAL configuration**. This option is not available unless the PAL is connected.

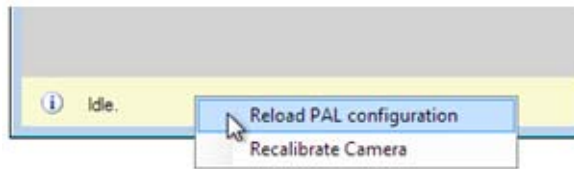


Figure 11 Reload PAL configuration

Maintenance
Changing/Moving PAL Objects

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In this book

This book covers:

- PAL configuration
- How to use the SCAP DBS software to create and edit cycles
- Maintenance information

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Revision A1, September 2012



G6066-90002



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