Permanent PDA Configuration with LCMS-9050

1. Overview

This guide outlines the setup and maintenance of an alternative configuration where the **column outlet is permanently connected through the SPD-M30A PDA**, and the **PDA outlet is routed to the switching valve**. The switching valve is used to select or deselect the LCMS-9050.

2. System Configuration

2.1 Plumbing Setup

- Connect the **column outlet** directly to the **inlet of the SPD-M30A PDA**.
- Connect the **PDA outlet** to the **switching valve**, which then routes flow either to the **LCMS-9050** or to waste, depending on the selected mode.

2.2 Instrument Configuration

- When running in **MS-Only mode**, ensure:
    - The **valve is set** to bypass the PDA output to the LCMS-9050.
    - The **PDA is turned off** and not included in the '9050-Only' instrument configuration.
    - This renders the PDA a **passive flow-through element**.

3. Advantages of This Configuration

- **Simplified Tandem Operation**: Enables easy transition to a tandem PDA-MS configuration (referred to as the "Forbidden" setup).
- **Improved Flow-Cell Maintenance**: Continuous solvent flow through the PDA reduces the risk of:
    1. **Contamination**
    2. **Degradation from stop-flow with D2 lamp on**
    3. **Drying out during storage**

4. Potential Disadvantages

- **Post-Column Dead Volume**: Adds ~10–15 µL, which may slightly reduce chromatographic resolution when using UPLC columns. However, in DIA mode, this may be beneficial due to slight peak broadening.
- **Particulate Contamination**: Risk of blockage in the flow-cell. Use a **particulate filter** upstream of the PDA.
- **Background Signal**: Running PDA at high concentrations may increase background in MS-only runs due to residual deposits.
- **Method Hygiene**: Strictly segregate methods by configuration to avoid errors or damage.

5. Maintenance Guidelines

5.1 Flow-Cell Care

- **Avoid Drying Out**: Always store the cell filled with **100% methanol**.
- **Monthly Flushing**: Flush the cell with pure methanol once per month to prevent degradation.
- **Avoid Stop-Flow with Lamp On**: Ensure the **D2 lamp is off** when there is no flow. If the pump is on and the PDA is accidentally powered, the shutter may open and degrade the cell.

5.2 Operational Best Practices

- **Keep PDA Off in MS-Only Runs**: Prevents unnecessary wear and background signal.
- **Use MS-Compatible Solvents**: Ensures compatibility and longevity of both PDA and MS systems.
- **Monitor for Noise**: Interference patterns (450–500 nm) may appear due to refractive index changes—this is normal and related to the capillary's internal reflection.

6. Notes on Flow-Cell Design

- The SPD-M30A uses an **85 mm capillary** with **Total Internal Reflection** to transmit light.
- The flow-cell is a **consumable**; internal components are not user-replaceable.
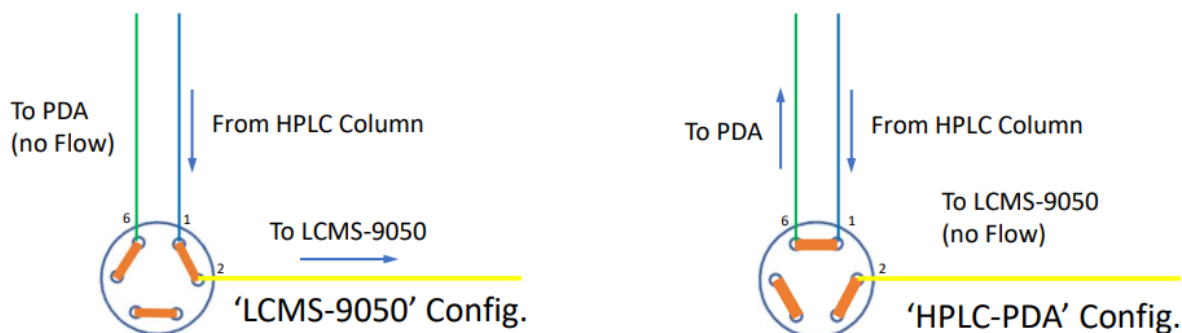- Most failures are due to **drying out** or **burnt contamination** from improper use.

Alternative LCMS-9050 or HPLC-PDA Flow Selection Configuration
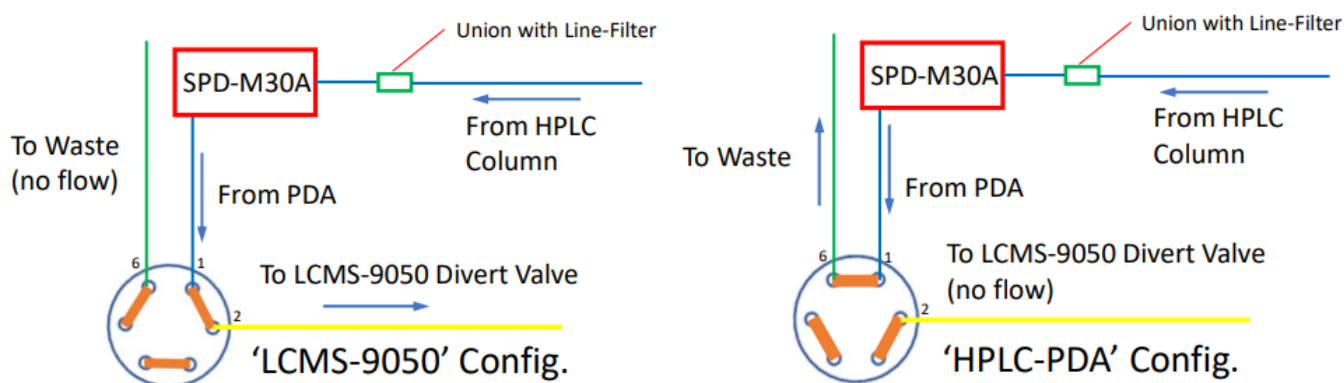
Note that the Left-hand Configuration and Valve Position would now remain the same when using the SPD-M30A and LCMS-9050, in Tandem.
The difference is which *Instrument Configuration Profile* is opened from LabSolutions, and whether the SPD-M30A is powered On (for PDA + 9050 use), or Off (for LCMS-9050-Only)

LCMS-9050 or HPLC-PDA Flow Selection

To PDA
(no Flow)

From HPLC Column

To LCMS-9050

'LCMS-9050' Config.

To PDA

From HPLC Column

To LCMS-9050
(no Flow)

'HPLC-PDA' Config.

Connect outlet from HPLC column to *Port 1*, on the valve (inlet *from* HPLC column).
Select *Switching-Valve Position* '1' in the software (currently the Default for LCMS-9050 Configuration)
Apply flow to column, and determine from which port ('2', or '6') solvent flows
Stop flow, and connect this port (shown here as '2' – but depends on rotor orientation) to the tubing leading to the LCMS-9050 *Divert Valve*
Download Valve Position '0' to the column oven, from Realtime, and confirm solvent flows from other port (shown here as '6')
Connect this port to PDA

Load 'LCMS-9050' Instrument Configuration. Check and, if necessary, ***change All Methods used with this Config***. to *Valve Position* '1'

Load 'HPLC-PDA' Instrument Configuration. Check and, if necessary, ***change All Methods used with this Config***. to *Valve Position* '0'
Clearly label methods, as to which instrument configuration they are intended for, and only use methods for the correct configuration