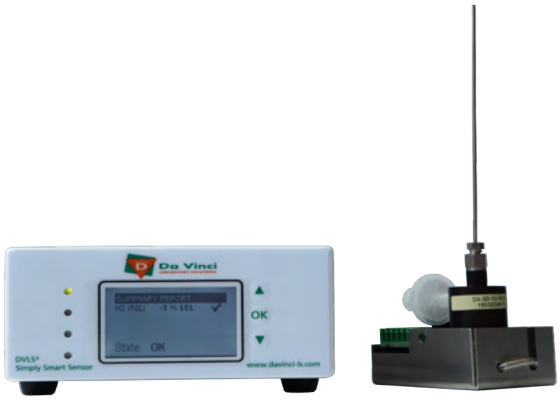
DVLS³ Simply, Smart Sensor

Ensures a Safe Use of Hydrogen as GC carrier gas

Hydrogen is an ideal alternative to Helium as a carrier gas; it significantly reduces the costs and analysis time without losing chromatographic resolution. Unfortunately the use of Hydrogen could also be dangerous. To resolve the safety concerns Da Vinci Laboratory Solutions (DVLS) developed the DVLS³ Simply, Smart Sensor. By constantly monitoring the Hydrogen concentration in the GC oven and automatically switching to an inert gas the DVLS³ Simply, Smart Sensor ensures the safe use of Hydrogen as a GC carrier gas.

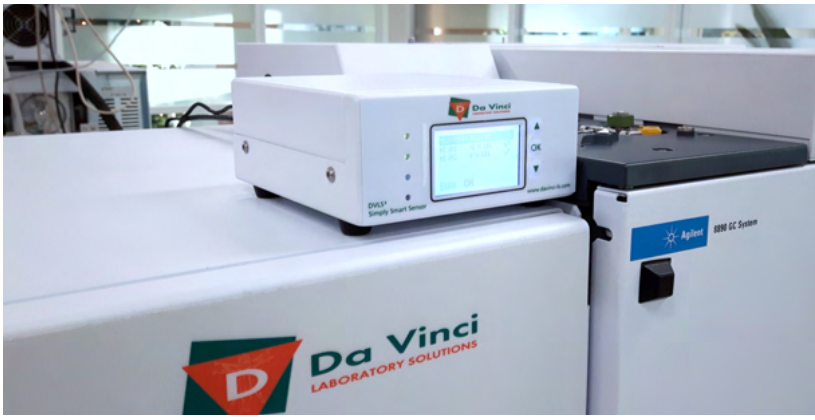
A GC analysis evidently benefits from the use of Hydrogen, but this carrier gas does have one disadvantage as it is an explosive gas! A broken GC column or a loose connection could leak Hydrogen, which might result in an explosion in the GC oven. The robustness of the GC limits the risk for the staff, but the laboratory will need to replace its GC.



DVLS³ Simply Smart Sensor and Controller

Monitor Hydrogen in GC Oven

The DVLS³ Simply, Smart Sensor is installed in the GC oven for continuous monitoring of the Hydrogen concentrations in the oven air. A carrier gas switch is installed in an external controller. The LCD screen of the controller displays the measured gas concentration.



Controller of the DVLS³ Simply, Smart Sensor on top of a GC

If the sensor detects a user defined Hydrogen concentration, typically between 25% and 50% LEL it will ensure the safety of the laboratory staff by several steps:

1. Automatically switch the carrier gas to an inert gas;
2. Send an automatic stop signal to the GC;
3. Generate an acoustic alarm signal;
4. Start flashing of the LCD controller screen.

The optional sensor software alerts the lab staff by:

- Showing a red status on the dashboard;
- Sending an alarm message by e-mail, text (SMS), Growl or Prowl.

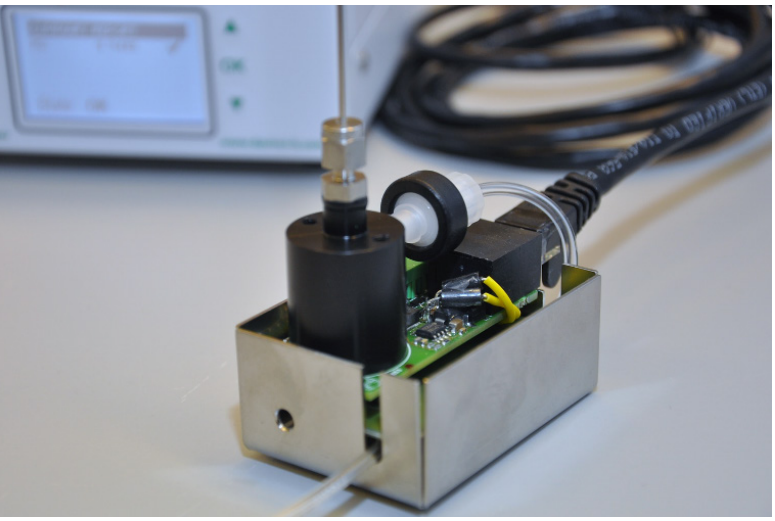
Boosting Laboratory Efficiency

Versatile Design

Due to the unique design of the DVLS³ Simply Smart Sensor you can combine up to four sensors in one controller. For example use four sensors for several GC's or connect several sensors to one GC. The sensor is compatible with all GC brands.

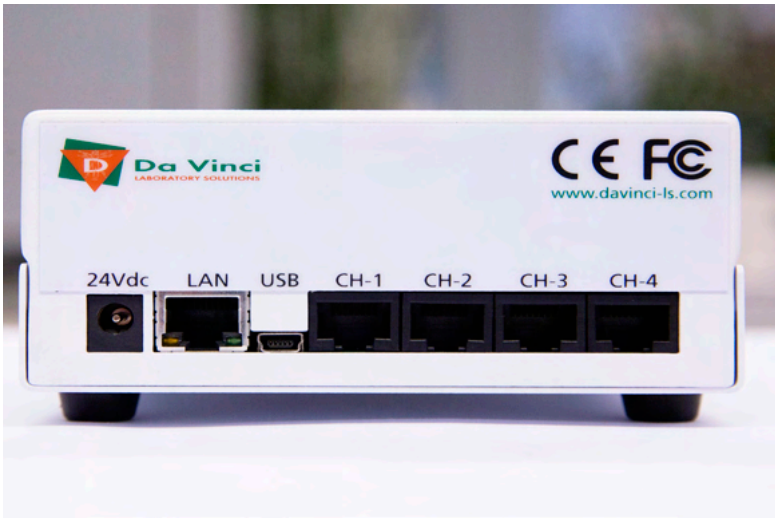
Next to the hydrogen leak detection Da Vinci Laboratory Solutions offers multiple sensors dedicated to the detection of:

- Hydrogen
- Temperature
- Barometric Pressure
- Level (liquid) weight



Hydrogen Sensor

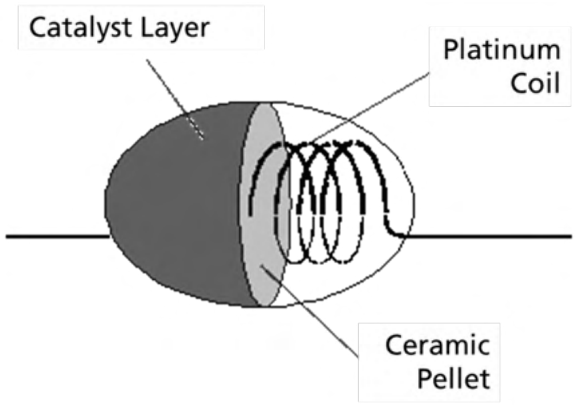
Technical Specifications	
Sensor control	Max 4 sensors individually controlled
Detection range	0-50% LEL (0-2.0% by vol. Hydrogen)
Linear range of Catalytic pellistor gas sensor	0-2% Hydrogen (0-50% LEL)
User defined alarm level optical and/or acoustic alarm	up to 50% LEL
Valve	High pressure 3 way solenoid valve
Oven operating temperature	up to 450°C 24VDC power adapter
Dimensions	11 cm (W), 5.5 cm (H), 14 cm (D)



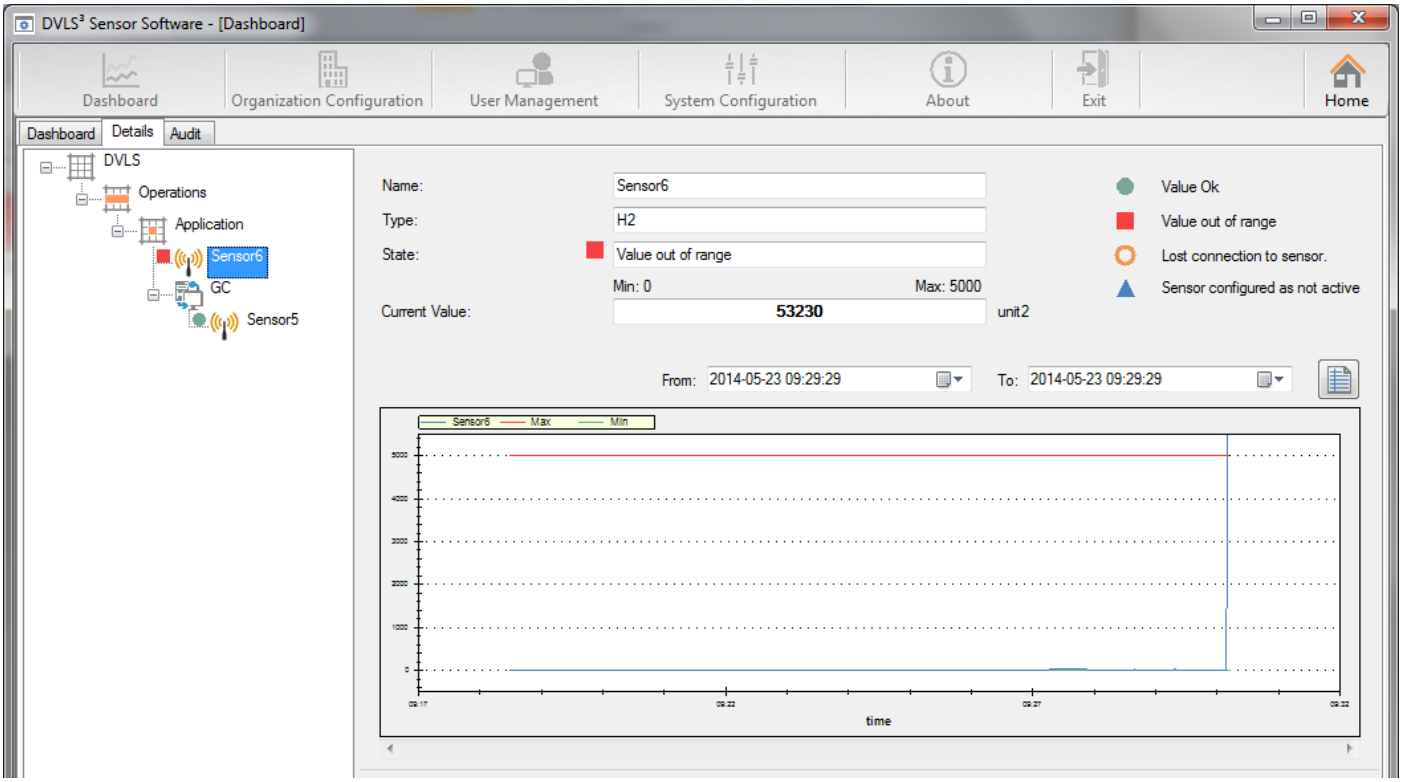
Connection for four Sensors

Principle of Operation

The principle of the DVLS³ Simply, Smart Sensor is based on a catalytic reaction on the surface of a pellistor, that consists of a very fine coil of platinum wire embedded within a ceramic pellet.
On the surface of the pellet is a layer of a high surface area noble metal, which, when hot, acts as a catalyst to promote exothermic oxidation of flammable gases.
The rise in temperature results in a change in the electrical resistance of the coil, and it is this change in electrical resistance which constitutes the signal from the sensor.



The Catalytic Gas Sensor



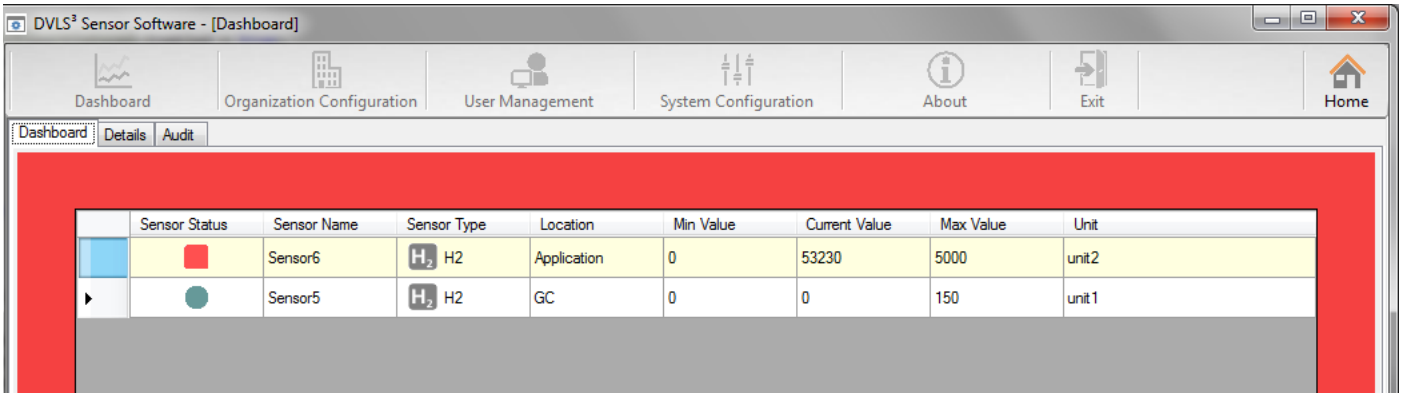
Setting the alarm in the DVLS³ Sensor Software

Optional Software Control

The optional DVLS³ Sensor software allows you to set up the system configuration, define alarm settings, manage users and create an audit trail.
Manage the user access level and their contact details to define the alarm messaging by e-mail, text (SMS), prowl or growl. In case the sensor detects a concentration that exceeds the user defined level the DVLS³ Sensor software will automatically transmit the alarm message(s) to the operator. The dashboard displays the detected values, the minimum & maximum levels and the transmitted alerts.

Audit trail

The Audit Trail option allows you check the performance of the sensor in time and create an overview of the changes in any settings. Filter the audit trail by location and report the alerts by print or as an CSV export file. Configure the hardware by manually entering the sensor specifications or use the Device Scanning option to automatically scan for new sensor devices and add the specifications.
The software can be used either stand-alone or in a network configuration.



the Dashboard of the DVLS³ Sensor software displaying the detected Hydrogen values



The Controller Display of the DVLS³ Simply Smart Sensor

Key Benefits of the DVLS³ Simply Smart Sensor

- ☑ Safe technique to constantly monitor Hydrogen leaks in GC oven;
- ☑ Automatically switch the carrier gas from Hydrogen to inert gas;
- ☑ Send stop signal to the GC;
- ☑ Automatic alarm transmission through:
  1. Optical and acoustic alarms
  2. E-mail messages
  3. Text (SMS) messages
  4. Growl
  5. Prowl

- ☑ Optional software controls the alarm settings per sensor & user;
- ☑ Audit trail function creates a record of the reported alarms and settings;
- ☑ Leak detection indicates analysis is compromised;
- ☑ Easy calibration and installation;
- ☑ Compatible with all GC brands;

- ☑ Versatile design supports up to four sensors.
  Select four sensor types out of the following options:
  1. Hydrogen
  2. Temperature
  3. Barometric Pressure
  4. Level (liquid) weight

The versatile multi sensor offers GC labs a safe solution to change the GC carrier gas to Hydrogen.

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