C4D Detector (Model ER125)
Contactless Conductivity Detector

Description

Capacitively-coupled contactless conductivity detection (C4D) systems apply a high voltage AC waveform to a transmitter electrode adjacent to a tube or channel in which electrophoretic (or chromatographic) flow is occurring. The AC signal capacitively couples into the sample, which conducts the signal to a second receiver electrode. The received, much attenuated, AC signal is demodulated to provide a DC signal which is dependent on the conductivity of the sample between the electrodes. This process occurs inside a headstage, which outputs a signal to the C4D Detector. The Detector removes signal offset, amplifies and filters the signal, and also generates the excitation waveform that is sent to the headstage.

Compatibility

The C4D Detector has an RS232 serial interface (which can also be used with most USB serial adaptors). Settings can be altered with supplied Windows software, or via user supplied software. The signal can be collected from the analog signal output, or via the RS232 interface. Many commercial data acquisition systems and chromatography recording systems will be compatible.

Requires an eDAQ C4D headstage for operation:
- ET120 CE Headstage for capillary electrophoresis
- ET125 General Purpose Headstage for tubing sizes of up to 0.125 inch outer diameter. (Specify diameter when ordering).
- ET121 Microchip Platform
- ET225 Micronit Microchip Platform
- For capillary electrophoresis (CE) or ion chromatography (IC)
- Signal supplied as digital (RS232 serial) or analog voltage
- Compatible with Agilent, Beckmann, and Prince CE systems
- Compatible with with all eDAQ C4D headstages

Applications

- Ion Chromatography (IC)
- Capillary Electrophoresis (CE)
- Microfluidic Channel Electrophoresis

For a list of chemical applications see over.

Specifications

| Connector: | 8 pin DIN socket |
| C4D Amp signal gain: | x1, x10, x100, x1000 |
| Signal resolution: | 16 bits, 0.0015% of range (Chart software) up to 24 bits (PowerChrom software) |
| Maximum input signal: | 3 V |
| Excitation frequency: | 50 — 1200 kHz |
| Excitation amplitude: | 200 V AC p-p maximum, dependent on headstage. Sinusoidal |
| Offset resolution: | 20 bit |
| Low pass filters: | 10 Hz with PowerChrom software 10, 5, 2, 1 Hz, with Chart software |
| Output signals: | $\kappa_{raw}$ 0 — 2 V; $\Delta \kappa$ 0 to ±3 V |
| Back panel connectors: | BNC (analog voltage) RJ45 (RS232 serial) R45 to DB9 adaptor included |
| Power requirements: (mains adaptor supplied) | 12 V DC, ~5 W |
| Dimensions (h x w x d): | 65 x 200 mm x 250 mm (2.6 x 7.9 x 9.8") |
| Weight: | 1.5 kg (3.3 lb) |
| Operating temperature: | 0 to 35 °C 0 to 90% humidity (non-condensing) |

eDAQ reserves the right to alter these specifications at any time.
Applications cont’d

Contactless conductivity detection can be used for virtually all charged species: inorganic anions and cations, as well as organic ions, such as carboxylic acids, amines, amino acids, peptides, proteins, DNA fragments, antibiotics and many other pharmaceutical compounds. Tagging or other modification of the analytes is usually NOT required, while limits of detection are often comparable to, or sometimes even better than UV-visible absorption techniques.

The C4D Detector is based on a design originally conceived by Professor Peter Hauser and co-workers at the University of Basel. Application areas are described in the research papers below:


