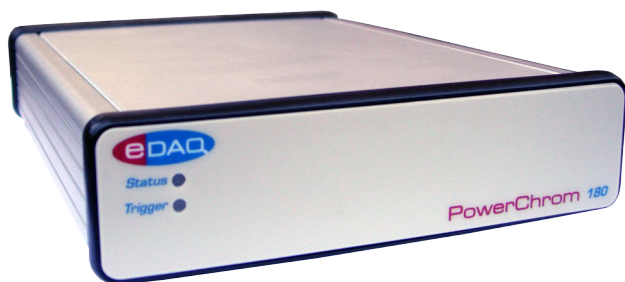# PowerChrom System (Models ER180R and ER181R)

- No programming required – just plug and play
- Collect signals from most chromatography detectors
- 24 bit resolution sigma-delta converter
- Independently selectable input ranges, ±10 mV to ±10 V
- Powerful software
- Contact closures* for triggering autosamplers, fraction collectors

Description

The PowerChrom systems are designed to connect to one or two* chromatography detectors for the recording of signals from GC, HPLC, IC or CE instruments on Windows computers.

Hardware

Your chromatography detectors should provide an 'analog voltage', 'integrator' or 'recorder' output signal. This also means the PowerChrom system is backwards compatible with many older chromatographs using paper recorders, integrators or obsolete data acquisition systems.

The signals are recorded using a 24 bit sigma–delta convertor with 32 bit internal number handling, on any of the gain ranges selected. Thus you signals will be recorded well beyond the inherent resolution of your detectors.

The system comprises PowerChrom hardware unit and PowerChrom® software. Power and interfacing are provided by USB connection to the computer. Detectors and other accessories are connected via a simple screw terminal strip.

A trigger input is available. The ER180R also includes four electrically isolated contact closure controls for signalling autoinjectors or fraction collectors etc.
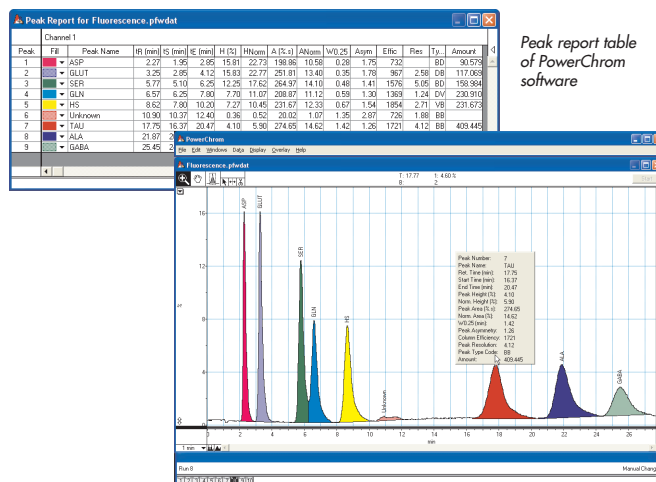

Peak report table of PowerChrom software

HPLC data displayed with PowerChrom software

Software

PowerChrom software is included with every PowerChrom system. It is compatible with Windows XP or later computers. It can also be ordered separately (ES280) or as a departmental license (ES281), if additional copies are required.

In fully Automatic software operation, **Methods** control run parameters and integration settings. **Sequences** can be used to execute a series of **Methods**, and apply various **Calibration** information to generate the Report.

In Manual operation, the software can be used to do one-off runs, or even a succession of such runs.

Similarly, as well as automated peak detection and assignment with Method and Calibration settings, you can also opt to perform 'manual peak editing' which offers full manual control of peak position and start and end times, even for shoulder peaks.

Autosamplers and fraction collectors can be triggered* with contact closure signals. Multiple run experiments are controlled via Sequence documents.

All information (sequence, methods, calibrations, peak reports, as well as the raw signal data) is stored in the one convenient data file, which can contain up to 999 runs!

* for the ER180R only

Indicator lights

PowerChrom 180 front and back panels

Instrument Connection Port

USB port & power

Specifications

Analog Inputs	
Number of detector channels:	2 (for ER180R) and 1 (for ER181R)
Input configuration:	Single-ended or differential
Range settings:	±10, ±5, ±2, ±1 V ±500, ±200, ±100, ±50, ±20, ±10 mV
Maximum input voltage:	±35 V
Input impedance:	~2 MΩ differential input ~1 MΩ to common
Low pass antialias filter:	500 Hz, 3rd order Bessel
DC offset:	< ±0.5 mV/°C after 5 minute warm up
DC drift:	< 0.5 µV/°C RTI (typical)
CMRR (differential):	better than −106 dB @ 1 Hz better than −140 dB @ 50 or 60 Hz
Channel crosstalk:	better than −140 dB @ 100 Hz
Noise (rms):	Range @1 /s @10 /s @100 /s 10 V 10 µV 20 µV 50 µV 1 V 1 µV 2 µV 5 µV 100 mV 0.1 µV 0.2 µV 0.5 µV 10 mV 0.1 µV 0.2 µV 0.5 µV

Sampling	
ADC resolution:	24 bit sigma–delta converter
System resolution:	1 nV
Sampling rates:	12 /min to 100 /s (PowerChrom software)

Microprocessor and Data Communication	
CPU:	MicroChip PIC32MX695F512H
Data communication:	USB 2.0 or 1.1 compliant

Output Amplifier	
Output configuration:	Single-ended
Maximum output:	10 V @ 5 mA
Output impedance:	0.1 Ω typical
Output range:	±10 V
Output resolution:	16 bits (0.3125 mV)

Instrument Connection Port	
Type:	20 pin male connector, 3.5 mm spacing. Screw terminal adaptor supplied.

Trigger	
Trigger input signal:	CC or TTL, non isolated.
TTL:	High: 4 V (7 V maximum) Low: 0.5 V. Active low.
Contact closure resistance:	< 100 Ω

Digital Output Controls (ER180R only)	
Outputs:	4 contact closures, optically isolated
Maximum switching:	50 mA @ 50 V
On resistance:	20 Ω

Physical Configuration	
Dimensions (w x h x d):	130 x 35 x 170 mm
Weight:	0.5 kg
Power Requirements:	USB compatible (cable supplied)
Operating conditions:	0 to 35 °C 0 to 90% humidity (non-condensing)

eDAQ Pty Ltd reserves the right to alter these specifications at any time.

Pin Out Specification

Pin	Name	Function	Pin	Name	Function
1	TRIG+	Contact closure or TTL	11	CTL1+	Contact closure 1
2	TRIG−	Contact closure or COM	12	CTL1−	Contact closure 1
3	CH1+	Detector 1, signal +	13	CTL1+	Contact closure 2
4	COM	Common	14	CTL1−	Contact closure 2
5	CH1−	Detector 1, signal −	15	CTL1+	Contact closure 3
6	CH2+	Detector 2, signal +	16	CTL1−	Contact closure 3
7	COM	Common	17	CTL1+	Contact closure 4
8	CH2−	Detector 2, signal −	18	CTL1−	Contact closure 4
9	DAC+	Analog output (< ±10 V)	19	Aux 1	Reserved for testing
10	COM	Common	20	Aux 2	Reserved for testing

For the ER181R, pins 6 to 20 have no function. Do NOT use.

Ordering

The PowerChrom systems include the recording hardware unit and PowerChrom software.

Additional PowerChrom software can be ordered as individual licenses (ES280) or as a departmental license (ES281).

The ER18X hardware is available in six configurations:

- **ER180R, ER181R**: for chromatography data, includes PowerChrom software.
- **ER180C, ER181C**: for general purpose data recording, includes Chart software.
- **ER180F, ER181F**: for flow injection analysis data, includes Chart software and FIA/Event Manager extensions.