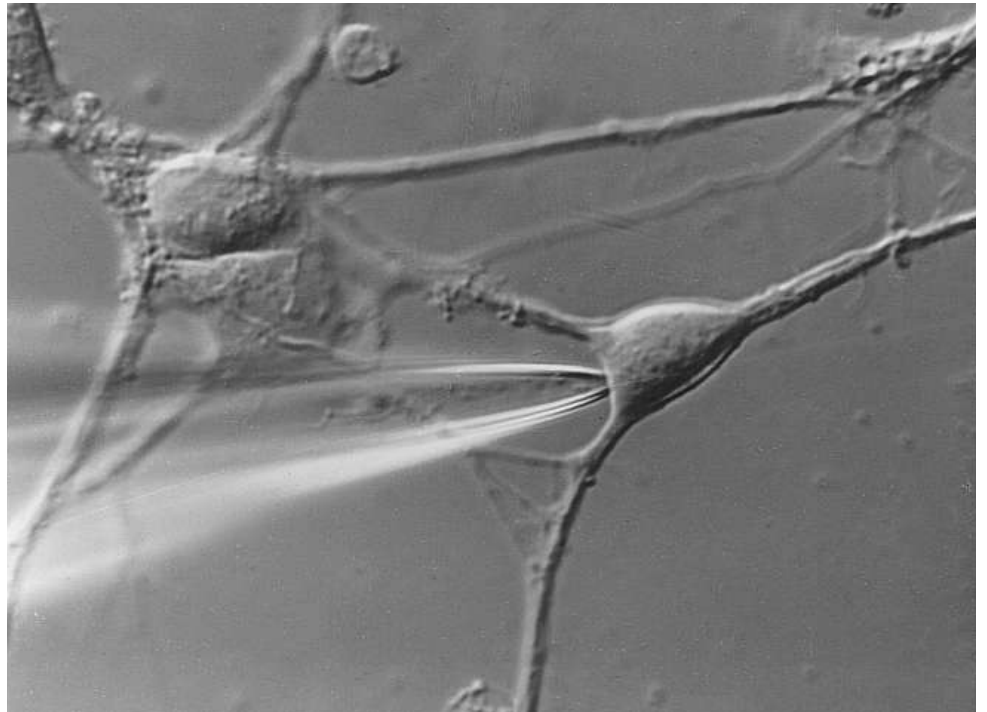




the Successor of the
classical EPC 7

EPC 8

Patch Clamp Amplifier



If you believe your job is to
make new discoveries...

... discover the EPC 8

The EPC 8 is a manually or
computer controlled patch
clamp amplifier for...

- High time resolution low
noise single-channel, whole-
cell, and loose patch
recordings
- Voltage clamp and current
clamp studies
- Recordings from artificial
membranes

Features of the EPC 8

- Control either manually or
digitally by computer
- Range-changing capability of
the headstage
- High quality hardware filters
- Extremely wide bandwidth
available from the current
monitor circuitry
- Integrated transient
cancellation and series-
resistance compensation
functions



With selectable manual or digital control, the EPC 8 is the amplifier of choice for every electrophysiological laboratory.



Improvements in comparison to the EPC 7:

- Holding potential range is increased to +/- 500 mV
- Pipette Offset compensation is increased to +/- 200 mV
- A fast current clamp mode is introduced, which allows better follow of rapid changes in membrane potential, such as in neuronal action potentials
- Fast current clamp is also possible in the low gain range
- RS compensation and C-Fast cancellation are active in current clamp mode
- A new low gain range allows measurement of currents up to 2 μ A.
- Only one current monitor output with a variable 7-pole Bessel filter in 12 steps: 0.1, 0.3, 0.5, 0.7, 1, 3, 5, 7, 10, 20, 30 kHz and FULL (Full with a 3-pole Bessel filter)
- C-Slow compensation is increased (0-1000 pF, calibrated)
- Built-in 'phase tracking' capabilities according to Fernandez, by use of 'dithering' an additional resistor in series with the bath electrode or an additional capacity in the C-fast circuit.

Control of the EPC 8:

- Manual control by use of the knobs and switches on the front panel.
- Digital control of the following functions by use of a computer via appropriate hardware:
 - Gain
 - Mode of the EPC 8: voltage clamp, current clamp etc.
 - Filter (current monitor)
 - 'Phase tracking'
 The 'dithering' of the external resistance and of the capacity can be controlled by the computer.
- Read the settings of the above mentioned parameters which are set manually on the front panel, except 'phase tracking'.

Modular patch clamp system

Set-up a complete patch clamp data acquisition system with the EPC 8, HEKA's LIH 1600 acquisition interface, and PATCHMASTER, the electrophysiology software.



The following different hardware configurations of a computer controlled EPC 8 system are possible:

Besides the computer, one of the following hardware components is required to control the EPC 8:

- LIH 1600 with PCI-1600 board
- ITC-18 with PCI-18 board
- any other 2 x 16 bit parallel digital I/O board

Establish software control by using

- PATCHMASTER, PULSE or TIDA in conjunction with the LIH 1600 or ITC-18 or
- write your own acquisition software for LIH 1600 or any other 2 x 16 bit parallel digital I/O board.

The documentation about control of the EPC 8 via LIH 1600 is included with the EPC 8 delivery volume thus allowing the use of this patch clamp amplifier together with your own programmed data acquisition software. Anybody, therefore, can use this patch clamp amplifier with his/her own data acquisition software.

Computer controlled fully implemented in PATCHMASTER

EPC 8 Remote window for software control of the EPC 8 form a HEKA electrophysiology software.

Documentation

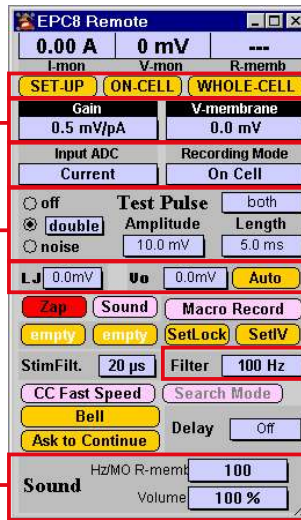
All EPC 8 settings will be stored with the raw data for easy reconstruction, analysis, and documentation of your experimental procedures.

Test Pulse

There are two test pulse modes: built-in test pulses (Double or single) and use of a stimulation template from the pulse generator as test pulse.

Audio monitor

A sound is played with its frequency coding for R-membrane. The tone (Hz/MΩ) and the volume can be specified.



Macros

Macro features allow the recording of routine functions and then accessing these Macros by a simple click of a button.

Mode

The mode of the EPC8 can be set according to your experiment like voltage clamp, current clamp etc.

Controls

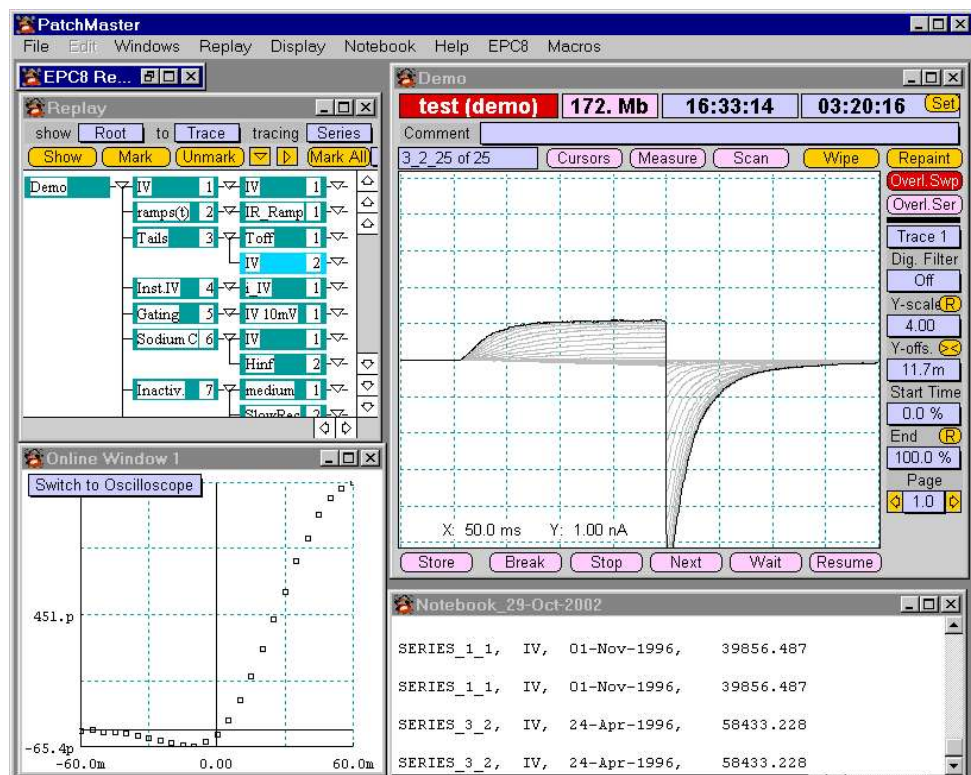
All values can be set automatically or manually by either the mouse or the keyboard.

Filters

Two built-in high quality hardware filters (Bessel response) perform excellent signal conditioning and remove the expense of purchasing additional filter instruments.

The EPC 8 is adapted to be used with a LIH 1600 acquisition interface and e.g. PATCHMASTER software.

For detailed information on PATCHMASTER or other HEKA software products supporting the EPC 8 please refer to separate brochures.



Technical specifications

EPC 8 Main Unit

Dimensions:
(25.0 x 48.3 x 9.0) cm,
(9.8 x 19.0 x 3.5) inch

Weight:
7.6 kg, mounts in a 19" rack.
Operates on standard
115 V / 230 V.

EPC 8 Headstage

Dimensions:
(40 x 70 x 19) mm,
(1.57 x 2.75 x 0.75) inch
The input circuitry is contained in
a hybrid integrated circuit.

Current measuring resistors:
50 G Ω (high range)
500 M Ω (medium range)
5 M Ω (low range)

Largest measurable currents:
200 pA (50 G Ω range)
20 nA (500 M Ω range)
2 μ A (5 M Ω range)

*Noise measurements with 4-pole
Butterworth or Bessel filter:*
DC to 1 kHz: <50 fA
DC to 3 kHz: <100 fA
DC to 10 kHz: <300 fA

Input connector:
Standard BNC

Other connections:
Ground sense input,
Pipette command output

Filters

The current monitor signal of the
EPC 8 is filtered by a 7-pole
Bessel filter from 0.1 - 30 kHz in
11 steps. In the additional 'FULL'
setting a 3-pole Bessel filter is
used and the current signal is
provided at full bandwidth of the
EPC 8.

Capacitance Compensation

Manual adjustment of the fast
and slow capacitance
cancellation.

C-fast:
0 to 10 pF, calibrated
0.5 to 5 μ s time constant
C-slow:
0.2 to 10 pF, calibrated
2 to 100 pF, calibrated
10 up to 1000 pF depending on
R-membrane, calibrated
Series conductance adjustment:
0.01 to 1 μ S, calibrated

Series Resistance Compensation

Automatically determined from
the capacitance transient
cancellation controls.

Fractional compensation:
0-90%

Pipette Offset

Adjustment of the pipette offset
in a range of +/-200 mV

Holding Potential

Hardware controlled holding
potential with a total range of
+/-500 mV.

Noise Monitor Signal

Gain:
0.005 to 1000 mV/pA
Bandwidth:
100 kHz (medium and low range)
60 kHz (high range)

Current Clamp

Range:
100 nA (low range)
1 nA (medium range)
Mode:
Fast and slow

Computer Interface

Computer controlled operation
via 2 x 16 bit parallel output board,
LIH 1600 or ITC-18 possible (see
also data sheet "Recommended
Configurations")

Related Products

LIH 1600

16-bit Multi-channel data
acquisition system

PATCHMASTER

Multi-channel patch clamp data
acquisition and analysis software
for Windows and MacOS.

PULSE/PULSEFIT

Patch clamp data acquisition and
analysis software for Windows
and MacOS.

X-CHART

Software implemented chart
recorder for Windows and
MacOS..

FURA

Synchronized patch clamp and
fluorescence measurements.

TIDA

Electrophysiological data
acquisition and analysis software
for Windows.

EPC 10

The fully computer controlled
patch clamp amplifier with built-
in interface board.

PIP 5

Temperature controlled micro
pipette puller.

MIM 4

Motorized 3-axis
micromanipulator with video
option.

Service & Support

As the first manufacturer of
patch clamp amplifiers in the
world HEKA knows the needs
of scientists. We provide
exceptional pre and post sales
customer support from our
trained international sales re-
presentatives and our own
technical support advisors. With
thousands of high performance
hardware and software prod-
ucts in daily use worldwide we
understand all aspects of data
acquisition systems not just the
software. You can get every-
thing from signal conditioning
and acquisition to analyzing and
data backup systems from one
supplier, to avoid compatibility
headaches.



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