

Product Overview — Electrophysiology

Patch Clamp Amplifier • Two Electrode Voltage Clamp
Software • Automated Patch Clamp Systems • Data Acquisition Boards
Electrophysiological Accessories • Electrical Shielding
Pipette & Electrode • Manufacturing



HEKA solutions for Electrophysiology.



HEKA provides hardware and software solutions for ion channel electrophysiology research. Patch Clamp rigs that are built on the HEKA platform can make high quality recordings from the activity in a single ion channel. In addition, software and hardware are engineered so experimental set up, data acquisition, and data analysis are efficient and repeatable. All of our equipment is designed and manufactured at our facilities in Germany, ensuring a quality product for all customers.

HEKA's core products offer researchers three classes of solutions. First the EPC-10 line of products offers users digitally controlled amplifiers that are controlled exclusively with software. Next, the EPC-800 is available for the community that desires a an amplifier that features manual user control with knobs and dials, while at the same time offers digital control as well. Finally the HEKA data acquisition interfaces allow HEKA software to drive non HEKA amplifiers in ion channel experiments.

In addition to amplifiers and software, HEKA offers ergonomic, high gain, low noise headstages that are tuned for frequencies used in patch clamp experiments. These electronics are supported by a family of adapters, pipette controllers and other accessories designed to optimize patch clamp recordings.

EPC 10 USB Patch Clamp Amplifier

The EPC 10 USB Patch Clamp Amplifier is the successor to the famous EPC 9 Patch Clamp Amplifier. It continues the successful tradition of a fully computer-controlled patch clamp amplifier with excellent technical specifications which enables the EPC 10 USB to be a versatile working horse in the scientific community. The EPC 10 covers a large span of applications from whole-cell to single-channel recordings.



Technical Specifications

- Integrated high-resolution, low-noise data acquisition interface (LIH 8+8)
- True Current Clamp Mode
- Extended C-Fast Compensation (80 pF)
- Extended Stimulation Range (2 V, 5 μ A)
- Low-Frequency Voltage Clamp Mode
- Resistor switching headstage with three gain ranges (switchable during an experiment)
- Filtering the Voltage Signal in Current Clamp Mode
- Filter 2 Bypass option
- 100 kHz Bandwidth
- Low Noise Performance (31 fA @ 1 kHz in High Gain Range)
- Supports 3-Electrode Mode
- Calibration and Hardware Test option
- MS Windows and Macintosh compatible

More details can be found in the EPC 10 USB brochure.

Applications

- Low Noise Whole-Cell Patch Clamp Recordings in Current Clamp (CC) and Voltage Clamp (VC) Mode
- Low Noise Single-Channel Recordings
- Fast Action Potential Recordings
- Fast Switching between VC and CC and vice versa
- Capacitance Measurements in Exo-/Endocytosis studies
- Simultaneous Stimulation and Recording from multiple cells
- Field Potential Recordings
- Bilayer and Nanopores Measurements
- Combined Photometry Experiments
- Combined Imaging (Calcium) Experiments
- Amperometry Measurements
- Capacitance Measurements
- File Template Stimulation
- Long-Term Potentiation and Depression studies

Patch Clamp Amplifier Family

Upgrade your EPC 10 to EPC 10 USB

The upgrade involves the replacement of the ITC-1600 interface board with the current LIH 8+8 interface board. This eliminates the need for hardware drivers and PCI cards, only a USB 2.0 port is required for operation.

ORDER #	PRODUCT NAME	DESCRIPTION
895135	EPC 10 Single	Upgrade of EPC 10 Single to EPC 10 USB Single
895134	EPC 10 Double	Upgrade of EPC 10 Double to EPC 10 USB Double
895136	EPC 10 Triple	Upgrade of EPC 10 Triple to EPC 10 USB Triple
895133	EPC 10 Quadro	Upgrade of EPC 10 Quadro to EPC 10 USB Quadro

EPC 10 USB Amplifiers

Our classic packages starting with an EPC 10 USB Single up to our workhorse, the Quadro.

ORDER #	PRODUCT NAME	DESCRIPTION
895000	EPC 10 USB Single Patch Clamp Amplifier	EPC 10 USB Patch Clamp Amplifier with a Red Star Headstage including Mounting Plates, Pipette Holder (1.5 mm OD) and a Model Circuit (MC-10)
895001	EPC 10 USB Double Patch Clamp Amplifier	EPC 10 USB Double Patch Clamp Amplifier with two Red Star Headstages including Mounting Plates, two Pipette Holder (1.5 mm OD) and a Model Circuit (MC-10)
895002	EPC 10 USB Triple Patch Clamp Amplifier	EPC 10 USB Triple Patch Clamp Amplifier with three Red Star Headstages including Mounting Plates, three Pipette Holders (1.5 mm OD) and a Model Circuit (MC-10)
895003	EPC 10 USB Quadro Patch Clamp Amplifier	EPC 10 USB Quadro Patch Clamp Amplifier with four Red Star Headstages including Mounting Plates, four Pipette Holders (1.5 mm OD) and a Model Circuit (MC-10)

No software is included. Different configurations are available on request.

Extend your EPC 10 USB Patch Clamp Amplifiers

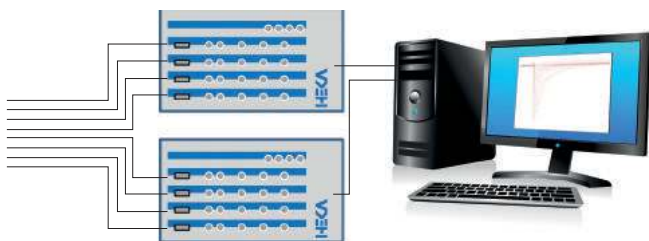
You can connect two EPC 10 USB or one EPC 10 USB and one data acquisition interface (InstruTECH LIH 8+8) to extend the number of available recording channels. Any combination (up to two) of EPC 10 USB amplifiers and LIH 8+8 interfaces is possible.

Example 1: 1x EPC 10 USB Triple Patch Clamp Amplifier +
1x LIH 8+8 stand-alone data acquisition interface



DEVICE	# PROBES	# FREE A/D INPUTS	# FREE D/A OUTPUTS
LIH 8+8	0	8	4
EPC 10 USB TRIPLE	3	1	1
Σ	3	9	5

Example 2: 1 x EPC 10 USB Quadro Patch Clamp Amplifier +
1 x EPC 10 USB Quadro Patch Clamp Amplifier



DEVICE	# PROBES	# FREE A/D INPUTS	# FREE D/A OUTPUTS
EPC 10 USB Quadro	4	0	0
EPC 10 USB Quadro	4	0	0
Σ	8	0	0

EPC 10 USB Patch Clamp Amplifier Systems

Complete packages of our EPC 10 USB Patch Clamp Amplifiers including headstages (Red Star or S-Probe), software license and accessories.



EPC 10 USB with Red Star Headstage

ORDER #	PRODUCT NAME	DESCRIPTION
895273	EPC 10 USB Single System with Red Star Headstage	EPC 10 USB Single Patch Clamp Amplifier with a Red Star Headstage including Mounting Plates, one Pipette Holder (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License
895274	EPC 10 USB Double System with Red Star Headstages	EPC 10 USB Double Patch Clamp Amplifier with two Red Star Headstages including Mounting Plates, two Pipette Holders (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License
895275	EPC 10 USB Triple System with Red Star Headstages	EPC 10 USB Triple Patch Clamp Amplifier with three Red Star Headstages including Mounting Plates, three Pipette Holders (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License
895276	EPC 10 USB Quadro System with Red Star Headstages	EPC 10 USB Quadro Patch Clamp Amplifier with four Red Star Headstages including Mounting Plates, four Pipette Holders (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License

All EPC 10 USB Patch Clamp Amplifiers are ready to be connected to a PC or Macintosh computer via USB 2.0. Different configurations are available on request.



EPC 10 USB with S-Probe Headstage

ORDER #	PRODUCT NAME	DESCRPTION
895277	EPC 10 USB Single System with S-Probe Headstage	EPC 10 USB Single Patch Clamp Amplifier with a S-Probe Headstage including Dovetail adapter, one Pipette Holder (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License
895278	EPC 10 USB Double System with S-Probe Headstage	EPC 10 USB Double Patch Clamp Amplifier with two S-Probe Headstages including Dovetail adapter, two Pipette Holders (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License
895279	EPC 10 USB Double System with S-Probe Headstage	EPC 10 USB Triple Patch Clamp Amplifier with three S-Probe Headstages including Dovetail adapter, three Pipette Holders (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License
895280	EPC 10 USB Quadro System with S-Probe Headstage	EPC 10 USB Quadro Patch Clamp Amplifier with four S-Probe Headstages including Dovetail adpater, four Pipette Holders (1.5 mm OD), one Model Circuit (MC-10) and a PATCHMASTER NEXT Software License

II EPC 10 USB Patch Clamp Amplifiers are ready to be connected to a PC or Macintosh computer via USB 2.0. Different configurations are available on request.

Automated Patch Clamp Systems

PatchServer

The PatchServer is an automatic patch clamp system that can establish whole-cell recording or excised-patch configurations using tools and techniques from the manual patch approach.

It utilizes standard glass pipettes and employs step-by-step procedures that would be applied by human experimenters in the classical Patch-Clamp procedure as well. Suspended cells are provided by a cell delivery system, caught by a “Catch pipette” and held in position until they are picked up by the recording pipettes. The precise and fast automated pipette positioning is accomplished by our unique guidance system.

The PatchServer combines the advantages from automatic and manual patch clamp, respectively. Automation improves ease of use and throughput, while still providing the high data quality of the glass-pipette based manual patch method. The PatchServer with its modular design adds automation to a classical patch clamp setup. I.e., the setup can still be used manually without modification.



ORDER #	PRODUCT NAME	DESCRIPTION
891166	PatchServer Basic-1	One-channel PatchServer setup for automatic establishment of any patch clamp recording configuration on suspended cells. Includes main unit, platform, catch pipette holder with amplifier, software, data acquisition computer with preinstalled software, accessories, and installation.

Let us help you configure a complete automated patch clamp rig! Just like our manual patch rig integration services (see page 18) we can offer you a complete set up including microscope, table, cage and peripherals all designed to work together with the PatchServer.

Technical Specifications

- Fully automated Patch-Clamping with standard glass pipettes
- Simultaneous, individual 4-channel recordings
- Low operating costs
- Cells can be visually identified and selected
- Piezo-driven sub-millisecond solution exchange (optional)
- Makes manual patch clamp easier and more efficient
- Visual evaluation of single cells before experiment
- Automated cell supply and Giga-Ohm sealing
- Automatically establishes whole-cell recording configuration
- Highest data quality at low running costs

Applications

- Ultra-fast compound application for recording from ligand gated ion channels
- Selection of cells from heterogeneous preparations, based on visual criteria (e.g. size, morphology, fluorescence)
- Works with spherical cells in suspension

More details can be found in the Multi Channel Systems PatchServer brochure.

EPC 800 USB Patch Clamp Amplifier



EPC 800 USB Patch Clamp Amplifier

The EPC 800 USB is a patch clamp amplifier for manual and computer-controlled operation. The Manual Mode was designed especially for researchers who desire manual user control through knobs and dials, while at the same time, longs for some degree of computer communication and automatic control. This amplifier is truly a unique hybrid patch-clamp amplifier with its design and feature-set primarily based upon the manually controlled EPC 8. The EPC 800 USB is the most flexible patch clamp amplifier HEKA has ever produced: a stand-alone amplifier that can be combined with any existing AD/DA interface and its compatible data acquisition software.

ORDER #	PRODUCT NAME	DESCRIPTION
895004	EPC 800 USB Patch Clamp Amplifier	1x EPC 800 USB Patch Clamp Amplifier 1x Red Star Headstage including Mounting Plates 1x Pipette Holder (1.5 mm OD) 1x Model Circuit (MC-10)
895259	EPC 800 USB Main Unit	1x EPC 800 USB Patch Clamp Amplifier

All EPC 800 USB Patch Clamp Amplifier are ready to be connected to a PC or Macintosh computer via USB 2.0. EPC 800 USB Main Unit (895259) does not contain any headstage, pipette holder, or model circuit.

Technical Specifications

- True Current Clamp Mode
- Automatic or Manual Capacitance Compensation
- Voltage Clamp Mode
- Low-Frequency Voltage Clamp Mode
- Current Clamp & Bridge Mode
- Resistor switching headstage with three gain ranges (switchable during an experiment)
- Telegraphing outputs for Gain, Bandwidth, Mode & C-Slow
- Operate in Local, Local & Telegraphing or remote Mode
- Multi-Parameter Display
- MS Windows and Macintosh compatible

Applications

- Whole-Cell Patch Clamp Recordings
- Single-Channel Recordings
- Fast Action Potential Recordings
- Capacitance Measurements in
- Exo-/Endocytosis studies
- Long-Term Potentiation and Depression studies
- Combined Photometry Experiments
- Combined Imaging (Calcium) Experiments
- File Template Stimulation

More details can be found in the EPC 800 USB brochure.

InstruTECH LIH 8+8



InstruTECH LIH 8+8 Data Acquisition Interface

The InstruTECH LIH 8+8 is a high resolution, low-noise scientific data acquisition system. It utilizes the latest USB 2.0 and high speed processing technologies. The analog input and output channels are isolated from the digital lines that communicate with the computer. Each analog channel has its own separate ground patch and the digital section has a completely different ground. The result is complete isolation of the acquisition side from the computer side with full 16 bit capability and low noise. The LIH 8+8 provides expandability and versatility that will satisfy both current and future needs.

ORDER #	PRODUCT NAME	DESCRIPTION
895035	InstruTECH LIH 8+8	InstruTECH LIH 8+8 Data Acquisition Interface

Ready to be connected to a PC or Macintosh computer via USB 2.0. For control and data acquisition the software PATCHMASTER NEXT, CHARTMASTER or POTMASTER is required.

Technical Specifications

- 8x Analog Differential Inputs (16-bit)
- 4x Analog Differential Outputs (16-bit)
- 16x Digital Input and Output Channels
- External Trigger Input
- 400 kHz Throughput Aggregate
- Separate Grounding Line for each Analog Channel
- MS Windows and Macintosh compatible

More details can be found in the InstruTECH LIH 8+8 brochure.

Headstages (Probes) / Headstage Accessories

Red Star Headstage

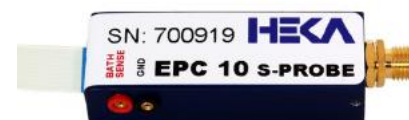
The Red Star Headstage is used with the EPC 10, EPC 10 USB or the EPC 800 USB Patch Clamp Amplifiers. It offers excellent noise levels in the most important 1 - 10 kHz bandwidth. Further, it has three feedback resistors (50 G Ω , 500 M Ω , 5 M Ω) for three gain ranges which are switchable during the measurement. The Red Star Headstage is also noise-optimized for demanding single-channel recordings. The amplifier (EPC 10 USB) and the headstage need to be calibrated using PATCHMASTER NEXT or EPCMaster software.



ORDER #	PRODUCT NAME	DESCRIPTION
895008	Red Star Headstage	Red Star Headstage with 240 cm flexible connection cable (42 g, 90x17x14.5 mm [LxWxH])

S-Probe Headstage

The unique feature of the S-Probe is the significantly reduced size and weight compared to our standard headstages. This allows for compatibility with a wider range of applications, especially when experimental space is limited or where the weight of the headstage itself matters. The electrical specifications of the S-Probe are identical to our standard Red Star Headstage, with the added feature of an optional bath sense connection enabling operation in 3-Electrode mode (with EPC 10 USB only). It is compatible with a new EPC 10 USB or EPC 800 USB amplifier and is also available as an upgrade. Check with our support team to find out if this headstage is supported by your HEKA patch clamp amplifier. The amplifier (EPC 10 USB) and the headstage need to be calibrated using PATCHMASTER NEXT or EPCMaster software.



ORDER #	PRODUCT NAME	DESCRIPTION
895137	S-Probe Headstage	S-Probe Headstage with 248 cm flexible ribbon cable and a BNC to SMA connector (24 g, 49x17x14.5 mm [LxWxH])

Headstage Accessories

ORDER #	PRODUCT NAME	DESCRIPTION
895132	1 Standard Headstage Mounting Plate	Standard Headstage Mounting Plate for the Red Star Headstage
895020	2 Dovetail Mounting Plate	Dovetail Mounting Plate for the Red Star Headstage
895315	3 Dovetail adapter plate for S-Probe (long)	Dovetail Adapter Plate (long version) for the S-Probe
895314	4 Dovetail adapter plate for S-Probe (short)	Dovetail Adapter Plate (short version) for the S-Probe
895104	5 Ground Connector Pin	Pin to connect the bath electrode to the GND connector of the headstage (pack of 10 Pins).
895190	Cable Set Preamplifier	Pack of two 25 cm long cables with 1 mm pin jacks for connecting the GND, COUNTER or REF electrode to a preamplifier.



1 Standard Headstage Mounting Plate



2 Dovetail Mounting Plate



3 Dovetail adapter plate for S-Probe (long)



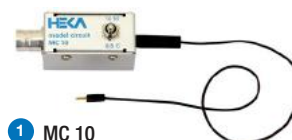
4 Dovetail adapter plate for S-Probe (short)



5 Ground Connector Pin

Model Cells for Patch Clamp Amplifiers

ORDER #	PRODUCT NAME	DESCRIPTION
895013	1 MC 10	The model cell "MC 10" mimics a model circuit of a biological cell with 500 M Ω membrane resistance, 5 M Ω access resistance and 22 pF cell capacitance. It is essential for testing and calibrating the EPC 10 USB Patch Clamp Amplifiers.
895014	2 MC-TESC1	Model circuit for two recordings (VC/CC) of one cell mimicking 10 M Ω and 20 M Ω access resistance, 500 M Ω membrane resistance and 22 pF membrane capacitance.
895140	3 MC-TETC3	Model circuit for two recordings from two cells, which are coupled by a gap-junction. Both cells have 500 M Ω membrane resistance, 22 pF membrane capacitance. The access resistance is either 10 or 20 M Ω . There is an additional switch to mimic a gap-junction conductance by a 10 or 100 M Ω series resistance.



1 MC 10



2 MC-TESC1



3 MC-TETC3

Model Cells for Two Electrode Voltage Clamp Amplifiers

ORDER #	PRODUCT NAME	DESCRIPTION
895176	1 MC-ITEV1 - Oocyte	Model circuit simulating a two electrode recording configuration from an oocyte. The model cell has a switchable membrane resistance (10/100 k Ω) and a switchable membrane capacitance (100/220 nF). This model cell is essential for testing and calibrating the iTEV 90 amplifier.
895139	MC-ITEV2 - Neuron	Model circuit simulating a two electrode recording configuration from a neuron. The model cell has a switchable membrane resistance (10/100 M Ω) and a switchable membrane capacitance (10/3.3 nF).



1 MC-ITEV1 - Oocyte

Pipette Holder

BNC-Type

BNC-Type Pipette Holders are made of extreme low-noise polycarbonate with a BNC connector. Suitable for all EPC 7, 8, 9 and EPC 10 / EPC 10 USB Patch Clamp Amplifier standard headstages.



ORDER #	PRODUCT NAME	DESCRIPTION
895227	Pipette Holder BNC Type 1.0 mm	Pipette Holder BNC Type 1.0 mm OD
895228	Pipette Holder BNC Type 1.3 mm	Pipette Holder BNC Type 1.3 mm OD
895229	Pipette Holder BNC Type 1.5 mm	Pipette Holder BNC Type 1.5 mm OD
895230	Pipette Holder BNC Type 1.7 mm	Pipette Holder BNC Type 1.7 mm OD
895231	Pipette Holder BNC Type 2.0 mm	Pipette Holder BNC Type 2.0 mm OD
895226	1 Electrode Connector BNC Type	BNC Type Electrode Connector
895232	2 Holder O-Ring S-Holder back end	Back end sealing O-ring for air tight seal between pipette holder and electrode connector pin (pack of 10).
895103	3 Electrode Connector Pin	Gold Pin to connect the silver wire to the headstage input (old BNC-type only!).



1 Electrode Connector BNC Type



2 Holder O-Ring S-Holder back end



3 Electrode Connector Pin

SMA-Type

SMA-Type Pipette Holders are made of extreme low-noise polycarbonate with a SMA connector. Suitable only for S-Probe Headstages.

ORDER #	PRODUCT NAME	DESCRIPTION
895148	Pipette Holder SMA Type 1.0 mm	Pipette Holder SMA Type 1.0 mm OD
895149	Pipette Holder SMA Type 1.3 mm	Pipette Holder SMA Type 1.3 mm OD
895150	Pipette Holder SMA Type 1.5 mm	Pipette Holder SMA Type 1.5 mm OD
895151	Pipette Holder SMA Type 1.7 mm	Pipette Holder SMA Type 1.7 mm OD
895152	Pipette Holder SMA Type 2.0 mm	Pipette Holder SMA Type 2.0 mm OD
895146	1 SMA Type Electrode Connector	SMA Type Electrode Connector
895232	2 Holder O-Ring S-Holder back end 2.0 mm	Back end sealing O-ring for air tight seal between pipette holder and electrode connector pin (pack of 10)



1 SMA Type Electrode Connector



2 Holder O-Ring S-Holder back end 2.0 mm

Microelectrode Holder

Connects microelectrodes or carbon fiber electrodes via a clip inside the gold pin which can hold wires in the diameter of >0.6 to 0.8 mm without soldering.

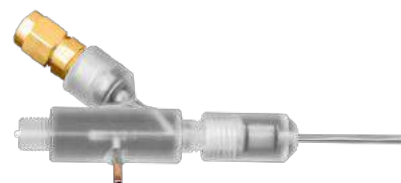
ORDER #	PRODUCT NAME	DESCRIPTION
895302	1 Holder Microelectrode SMA 2.0 mm	Microelectrode Holder SMA Type (2.0 mm OD)



1 Holder Microelectrode SMA 2.0 mm

Opto-Pipette Holder

A straight optical port (SMA Type) couples a HEKA cannula to an optical fiber. Under 40 degrees, a second SMA Type port connects a silver wire. Under 90°, a third 1.5 mm OD steel tube allows connection to a pressure control device. The cannula and silver wire can be inserted to a pipette with 1.5 mm OD and 0.86 mm ID.



ORDER #	PRODUCT NAME	DESCRIPTION
895295	Opto-Pipette Holder SMA 1.5 mm	Opto-Pipette Holder SMA Type (1.5 mm OD) with one cannula and a silver wire.
895290	1 SMA Fiber Holder - Dovetail	The holder with dovetail adapter plate is used to couple a SMA optical fiber with a SMA-type optical holder.
895291	2 Glass Rod Holder SMA Type 1.0 mm	Glass Rod Holder that accepts a 1.0 mm OD glass rod and can be coupled to an optical fiber with the SMA Fiber Holder.
895312	Glass Rod Holder SMA Type 2.0 mm	Glass Rod Holder that accepts a 2.0mm OD glass rod and can be coupled to an optical fiber with the SMA Fiber Holder.



1 SMA Fiber Holder - Dovetail



2 Glass Rod Holder SMA Type 1.0 mm

Theta-Pipette Holder

Three-port pipette holder for theta glass. The two electrical ports have male SMA connectors. A 1.5 mm (OD) steel tube enables connection to a pipette pressure control system.



ORDER #	PRODUCT NAME	DESCRIPTION
895296	Theta-Pipette Holder SMA 1.2 mm	Theta-Pipette Holder SMA Type (1.2 mm OD) with two contacted silver wires
895297	Theta-Pipette Holder SMA 1.5 mm	Theta-Pipette Holder SMA Type (1.5 mm OD) with two contacted silver wires
895298	Theta-Pipette Holder SMA 2.0 mm	Theta-Pipette Holder SMA Type (2.0 mm OD) with two contacted silver wires

Pipette Holder Accessories

Replacement Cap Sets

The Replacement Cap Sets can be used for BNC-Type and SMA-Type Pipette Holders.



ORDER #	PRODUCT NAME	DESCRIPTION
895016	Replacement Cap Set 1.0 mm	Screw Cap, Distance Sleeve and two O-rings
895097	Replacement Cap Set 1.3 mm	Screw Cap, Distance Sleeve and two O-rings
895098	Replacement Cap Set 1.5 mm	Screw Cap, Distance Sleeve and two O-rings
895099	Replacement Cap Set 1.7 mm	Screw Cap, Distance Sleeve and two O-rings

O-ring Replacement Sets

The O-rings replacement sets can be used for BNC-Type and SMA-Type Pipette Holders.



ORDER #	PRODUCT NAME	DESCRIPTION
895017	Holder O-Ring 1.0 - 1,7 mm	O-rings for Pipette Holders for outer diameters in the range from 1.0 to 1.7 mm (pack of 10).
895101	Holder O-Ring 2.0 mm	O-rings for Pipette Holders for outer diameter of 2.0 mm (pack of 10).

Cables

ORDER #	PRODUCT NAME	DESCRIPTION
895102	Connecting cable DG4 / EPC 10 USB	Cable to connect the DG4 / Lambda-10/2 or Lambda-10/3 with the digital outputs of the EPC 10 USB / InstruTECH LIH 8+8
895113	Connecting Cable ValveLink 8 / EPC 10 USB	Cable to connect the ALA ValveLink 8 with the digital outputs of the EPC 10 USB / InstruTECH LIH 8+8
895214	1 Trigger Cable 0-7	Stage with XY translator, fits Olympus BX-51WI upright, SubD 25 to 8 BNC cable to connect the digital outputs of the EPC 10 USB / InstruTECH LIH 8+8 to BNC connectors. Provides access to digital output channels 0 to 7 via BNC connectors. metric thread
895323	Trigger Cable 8-15	SubD 25 to 8 BNC cable to connect the digital outputs of the EPC 10 USB / InstruTECH LIH 8+8 to BNC connectors. Provides access to digital output channels 8 to 15 via BNC connectors.



1 Trigger Cable 0-7

Patch Clamp Accessories

Hybrid Stage for Microscopy



The Hybrid Stage from Warner Instruments for Microscopy provides a stable platform for patch clamp studies and other experiments. The height is position able in the Z-axis direction, while the microscope is moved in the X-Y plane by a smooth, high precision translator with stepper motors. The XY-translator is available with manual and motorized control. We offer different platforms for inverted and upright microscopes. Motorization can be upgraded any time. It offers a travel range of 381 mm for all dimensions. The stage comes with rails for easy positioning of tools.

Hybrid Stage for Inverted Microscope - metric threads

ORDER #	PRODUCT NAME	DESCRIPTION
642373	MMN-ET-M	Stage with XY translator, fits Nikon Eclipse T inverted, metric thread
642374	MML-DM-M	Stage with XY translator, fits Leica DMI8 inverted, metric thread
642375	MMO-IX-M	Stage with XY translator, fits Olympus IX-73 inverted, metric thread
642375	MMZ-AX-M	Stage with XY translator, fits Zeiss Axiovert inverted, metric thread

Hybrid Stage for Upright Microscope - metric threads

ORDER #	PRODUCT NAME	DESCRIPTION
642377	MMN-FN1-M	Stage with XY translator, fits Nikon E600 FN1 upright, metric thread
642378	MML-LFS-M	Stage with XY translator, fits Leica DM LFS upright, metric thread
642379	MMO-X51-M	Stage with XY translator, fits Olympus BX-51WI upright, metric thread
642380	MMZ-2FS-M	Stage with XY translator, fits Zeiss Axioscope 2FS upright, metric thread

Your Microscope is not listed? Contact our sales team for customization!

Electrical Shielding

Faraday Cages



In many applications, the signal-to-noise ratio can be improved only with the use of a Faraday cage. A Faraday cage shields by suppressing electromagnetic waves due to high surface conductance and high permeability. They are made of steel without the use of stainless steel or aluminum and painted blue. The walls are of rugged construction and consist of coated punched sheet metal. All instruments can be grounded at one central grounding point, which can be freely positioned by the user.

ORDER #	PRODUCT NAME	DESCRIPTION
895071	Faraday Cage Standard	1x Stand-alone Faraday Cage (190 x 110 x 83 cm)
895072	Faraday Cage (Demountable)	1x Stand-alone Faraday Cage (190 x 130 x 100 cm)
895073	Faraday Cage Custom Measure (Demountable)	1x Stand-alone Faraday Cage Dimensions according to prior agreement
895074	Faraday Cage Large Version N (Demountable)	1x Stand-alone Faraday Cage (190 x 130 x 100 cm)
895075	Faraday Cage Large Version T (Demountable)	1x Stand-alone Faraday Cage (190 x 130 x 100 cm)
895289	1 Shielding Cloth Kit	High performance and extra lightweight conducting fabrics for flexible shielding purpose. Dampening better than 65 dB up to GHz frequency range. Thickness: 85 µm; Weight: 34 g/m ² . Dimension: 110 x 110 cm. It includes one crocodile clamp and one cable (100 cm) with banana plugs.



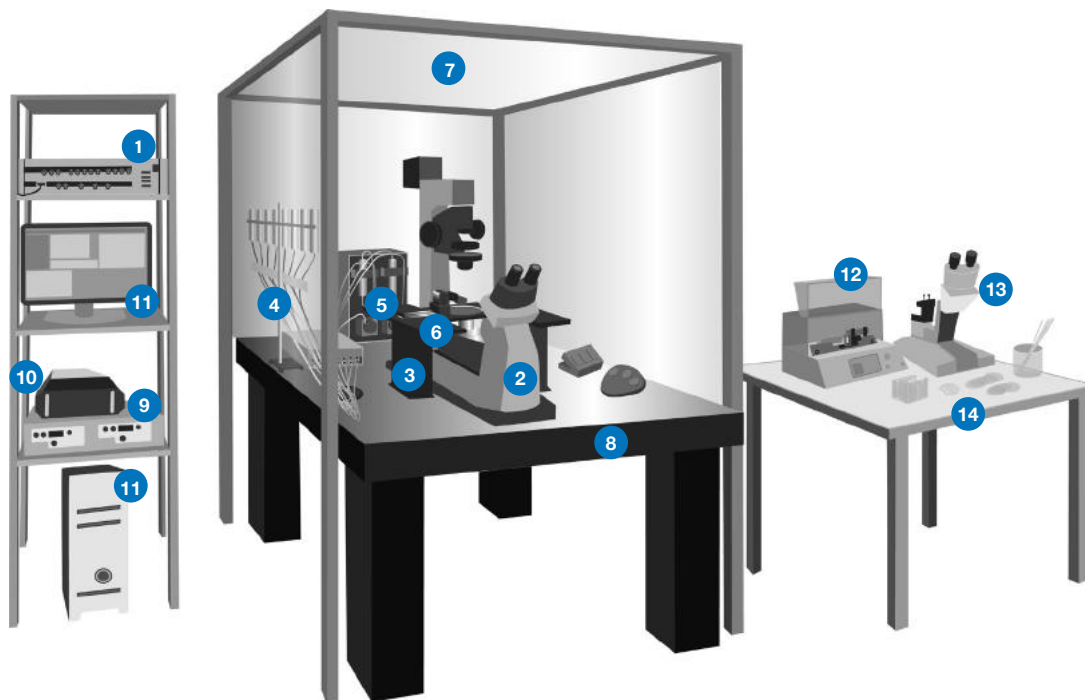
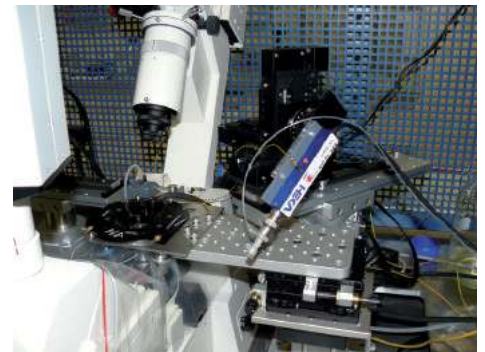
1 Shielding Cloth Kit

Complete Patch Clamp Systems

Integrated Patch Rigs

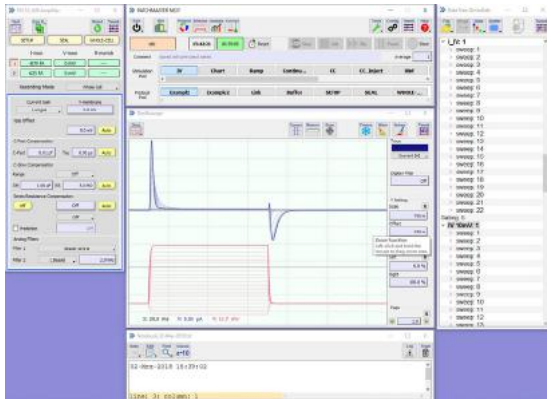
Patch Clamping diverges into many different applications requiring diverse hardware and software solutions. In order to facilitate the process of setting up a new laboratory, HEKA designs customer specific solutions, integrating all required hardware devices and software systems into a complete set-up.

To avoid the hassle picking the right components and setting up a system HEKA offer this special service. Contact our sales representatives (sales@heka.com) to get your personalized quote for a complete patch clamp setup.



- 1 Amplifier and data
- 2 Microscope
- 3 Stage
- 4 Perfusion System/chambers
- 5 Pump--vacuum or bath outflow
- 6 Micromanipulator
- 7 Faraday Cage
- 8 Table
- 9 Temperature Control
- 10 Stimulus Generator
- 11 PC/Software
- 12 Pullers
- 13 Microforge-grinding, beveler
- 14 Capillary/coverlips/accessories

PATCHMASTER NEXT



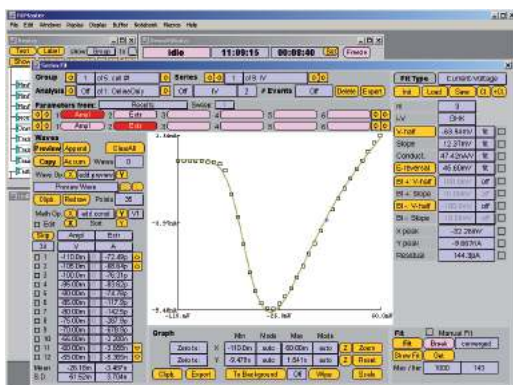
PATCHMASTER NEXT is a new version of our famous PATCHMASTER software. It retains the multi-channel stimulation and data acquisition capabilities of its predecessor, but offers a brand new graphical user interface to increase user-friendliness and accelerate familiarization with its work flow. PATCHMASTER NEXT is currently only compatible with the EPC 10 USB Patch Clamp Amplifiers but will soon also support the EPC 800 USB Patch Clamp Amplifier and the InstruTECH LIH 8+8 data acquisition interface.

The purchase of a license includes free updates.

ORDER #	PRODUCT NAME	DESCRIPTION
895245	PATCHMASTER NEXT	1x USB 2.0 Dongle containing the PATCHMASTER NEXT license
895246	PATCHMASTER NEXT Upgrade	Upgrade from PULSE Software to PATCHMASTER NEXT software. The customer needs to send his PULSE Dongle and gets back an USB Dongle containing the PATCHMASTER NEXT license.
895247	Dongle Exchange PATCHMASTER NEXT	Exchange of an old or broken PATCHMASTER or PATCHMASTER NEXT dongle. The customer needs to return the original dongle before the replacement can be sent.

PATCHMASTER NEXT runs on MS Windows 10 (64-bit) or Apple OS ≥ 10.6.
All PATCHMASTER NEXT dongles contain a valid PATCHMASTER license, too.

FITMASTER



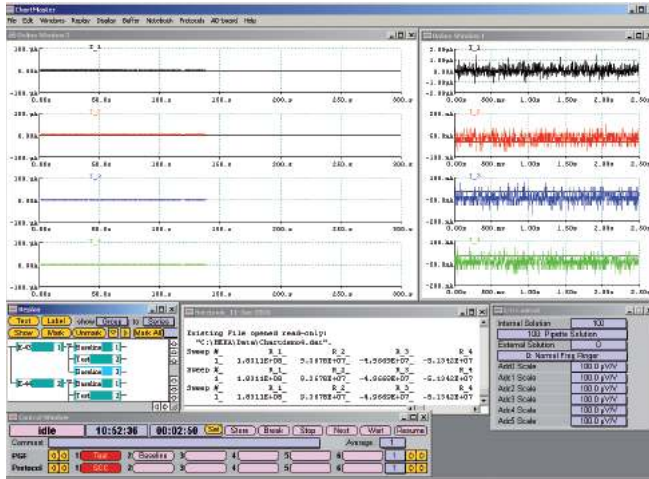
FITMASTER is an Analysis Tool including curve-fitting modules optimized for data acquired with PATCHMASTER, CHARTMASTER or POTMASTER.

The purchase of a license includes free updates.

ORDER #	PRODUCT NAME	DESCRIPTION
895046	FITMASTER	2x USB 2.0 Dongle containing the FITMASTER license
895107	Dongle Exchange FITMASTER	Exchange of an old or broken FITMASTER dongle. The customer needs to return the dongle before the replacement can be sent.

FITMASTER runs on MS Windows 7, 8 and 10 (32/64-bit) or Apple OS ≥ 10.6

CHARTMASTER

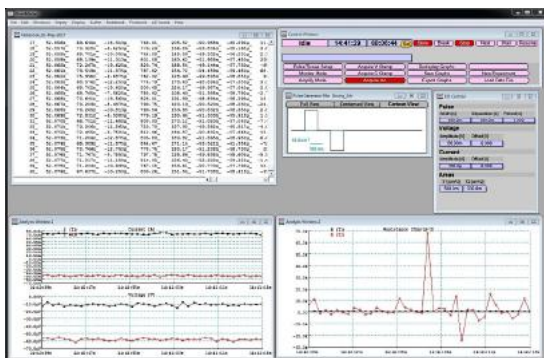


CHARTMASTER is a multi-purpose stimulation and data acquisition software with programmable experiment control and automation. It supports any HEKA Data Acquisition Interface like ITC-16, ITC-18, ITC-1600 and LIH 8+8. In combination with an HEKA Data Acquisition Interface any other Patch Clamp Amplifier can be used.

The purchase of a license includes free updates.

ORDER #	PRODUCT NAME	DESCRIPTION
895048	CHARTMASTER	1x USB 2.0 Dongle containing the CHARTMASTER license
895051	Dongle Exchange CHARTMASTER	Exchange of an old or broken CHARTMASTER dongle. The customer needs to return the original dongle before the replacement can be sent.

USSINGCHART

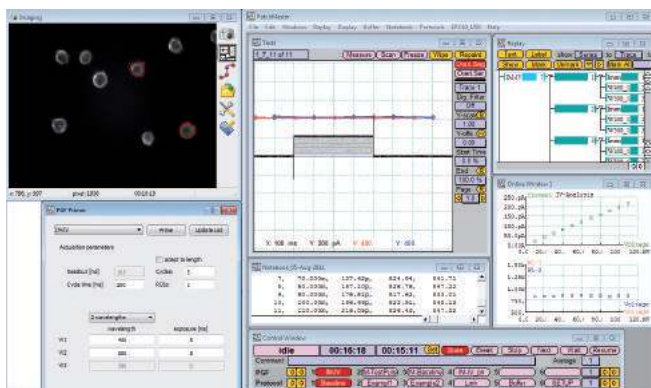


Multi-channel data acquisition software designed specifically for epithelial transport studies. This software is part of a package containing epithelial voltage clamp amplifiers from Warner Instruments. 2, 4, 6 or 8 channel configurations are available on request.

ORDER #	PRODUCT NAME	DESCRIPTION
895285	USSINGCHART	USB 2.0 Dongle containing the USSINGCHART license

USSINGCHART runs on MS Windows 7, 8 and 10 (32/64-bit).

SmartLUX



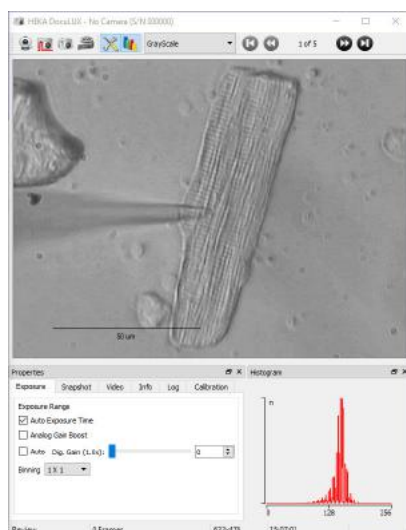
SmartLUX is an imaging extension for our PATCHMASTER, POTMASTER and CHARTMASTER software. Together with the software it controls the light source and the camera. Image acquisition is synchronized with the stimulation and data acquisition of the main program. The mean fluorescence values of the assigned ROIs are stored as additional data traces. Further, imaging and electrophysiological data are linked to each other.

The purchase includes free updates.

ORDER #	PRODUCT NAME	DESCRIPTION
895050	SmartLUX	SIDX License Document including software package and manual
895165	CCD Research Camera	CCD Research Camera (2/3" monochrome, 14-bit, 1360 x 1024 pixel, USB 3.0) including a Trigger Cable

Cameras from the following manufacturers are available: *Andor, QImaging, Photometrics, Hamamatsu and PCO*. Please contact us to learn more about the supported camera models. SmartLUX and DocuLUX run on MS Windows 7, 8 and 10 (32/64-bit).

DocuLUX



DocuLUX is a camera system containing either a monochrome or color camera together with the software. It is a low-cost bundle which provides enormous help for visualizing and documenting your specimen before, during or after your experimental recordings. DocuLUX can be used together with PATCHMASTER, POTMASTER or CHARTMASTER or as a stand-alone software.

The DocuLUX software can only be used with the camera provided by HEKA.

The purchase includes free updates.

ORDER #	PRODUCT NAME	DESCRIPTION
895286	DocuLUX Camera System CT-1600 x 1200	Color CMOS camera with 1/1.8" sensor (1600x1200 resolution, 4.5 µm pixel size, binning 1 x 1 and 2 x 2, 8-bit, C-mount), Trigger Cable (Hirose to BNC), USB 3.0 cable and a software manual
895287	DocuLUX Camera System MT-1600 x 1200	Monochrome CMOS camera with 1/1.8" sensor (1600 x 1200 resolution, 4.5 µm pixel size, binning 1 x 1 and 2 x 2, 8-bit, C-mount), Trigger Cable (Hirose to BNC), USB 3.0 cable and a software manual

For over 50 years HEKA has designed and manufactured sophisticated instrumentation and software for biomedical and industrial research applications. Through the years, HEKA has achieved an unparalleled reputation for precision and quality. Medical, pharmaceutical and industrial research facilities world-wide rely on HEKA ingenuity for their discoveries.

While there have been many changes in research, instrumentation, and software, our commitment to bring innovative technology to our customers remains constant. HEKA is a select group of engineers, biomedical researchers, and computer scientists who pride themselves on the quality of HEKA products. HEKA offers complete pre- and post-sales technical support, and takes care of each customer personally. In every way, HEKA provides solutions.

Since 2015 HEKA is a division of Harvard Bioscience. Together with our partner brands we strive to provide solutions to advance life science and research.



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