

PatchServer

Pipette-Based Automatic Patch Clamp System

- Makes manual patch clamp easier and more efficient
- Cells can be visually evaluated before the experiment
- Automated cell supply and Giga-Ohm sealing
- Automatically establishes whole-cell recording configuration
- Works with standard glass pipettes
- Highest data quality at low running costs
- Simultaneous recording from up to 4 patch pipettes

PatchServer: Manual patch clamp goes automatic

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.

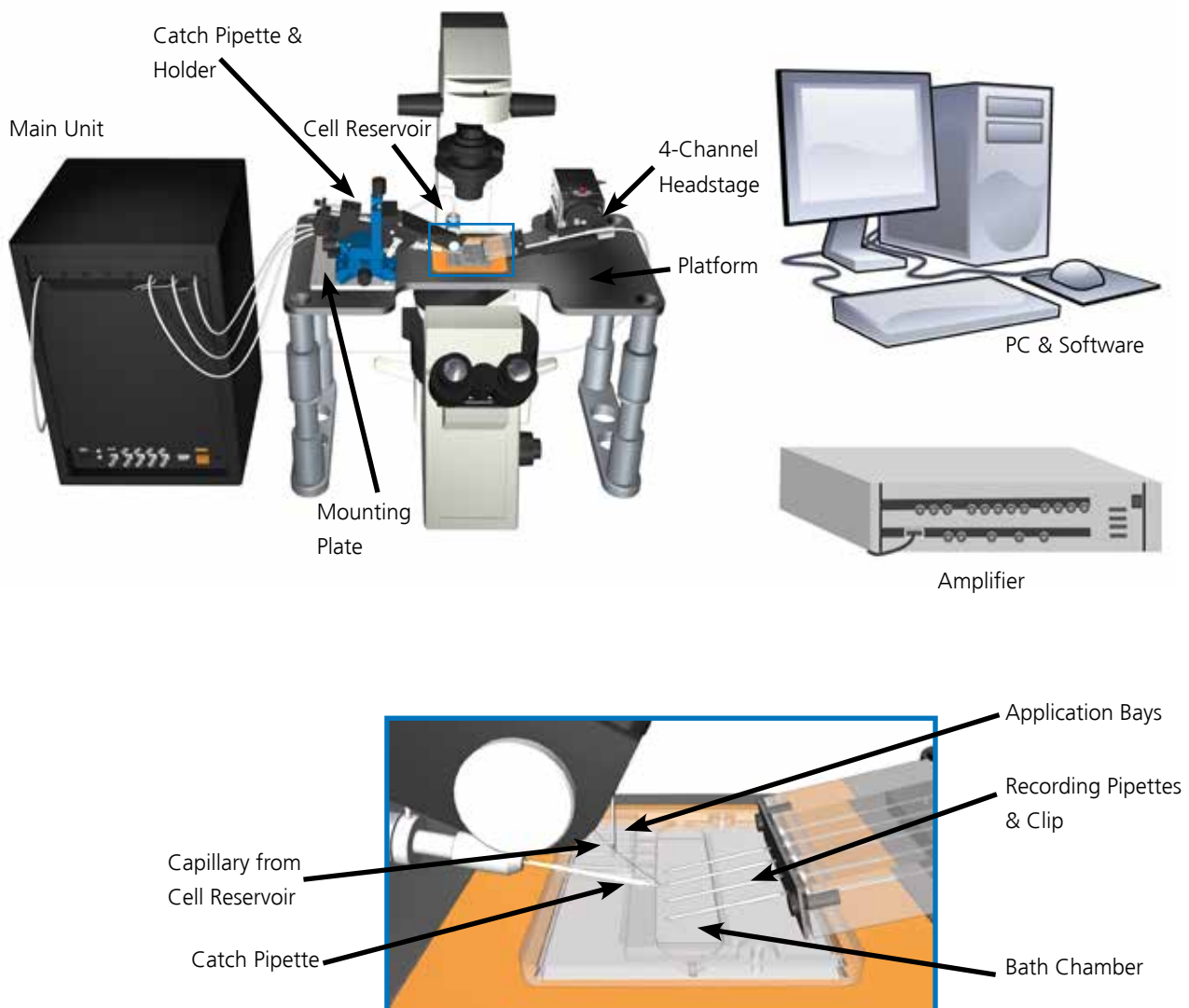
It utilizes standard glass electrodes and employs step-by-step procedures that would be applied by human experimenters as well.

The PatchServer combines advantages from the automatic and manual patch clamp approach, respectively. Automation improves ease of use and throughput, while still providing the gold standard 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.

Modular components

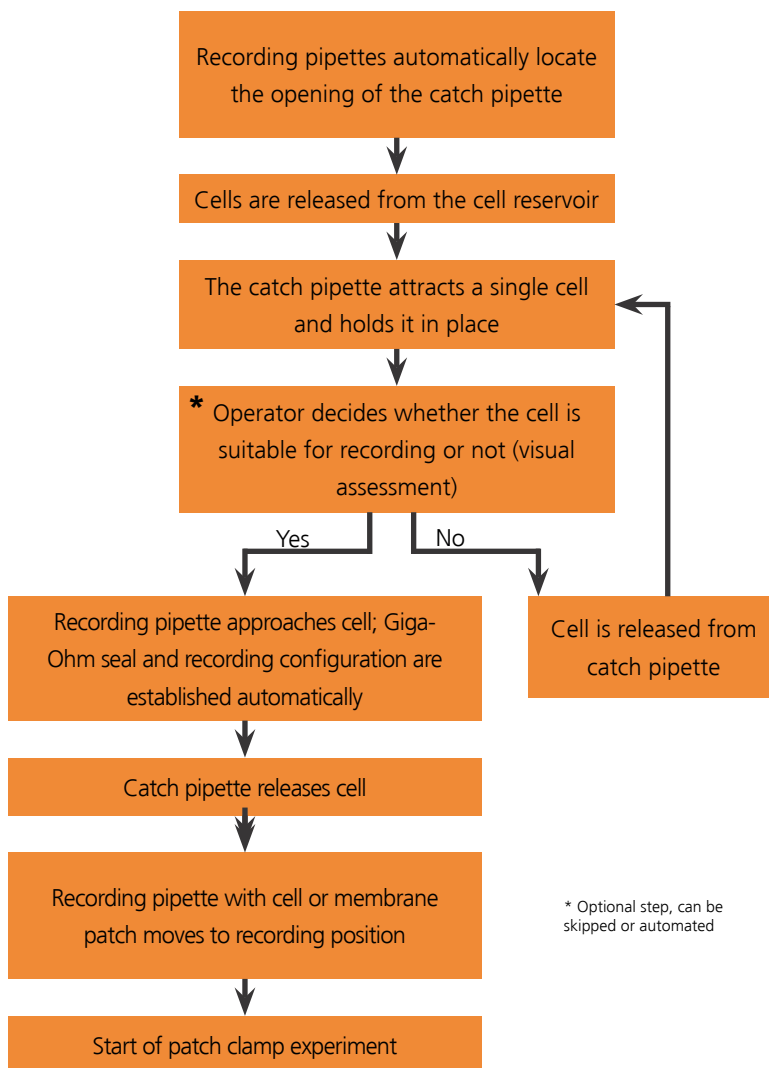
PatchServer modules can be readily integrated in an existing patch clamp setup.

Depending on the customer's needs, Multi Channel Systems can supply the full range of equipment from the minimum number of PatchServer specific parts to a complete, fully functional patch clamp setup. The PatchServer is available with either one or four channels and comes with a powerful software for automatic control and supervision of the entire patch procedure.



Principle of operation

The PatchServer executes all steps fully automatically and requires minimal user intervention.



Automatic establishment of recording configurations

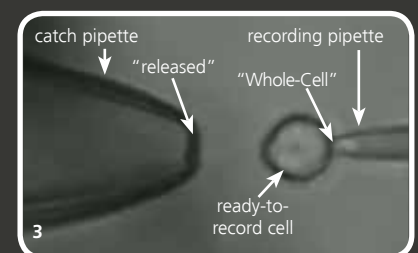
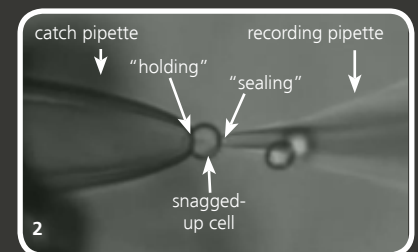
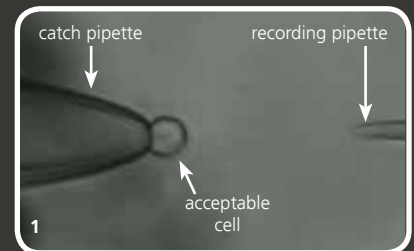
With the PatchServer all patch clamp recording configurations can be established, from cell-attached, cell-free, inside-out and outside-out to whole-cell recording configurations. This is possible because the PatchServer utilizes standard glass electrodes and follows in its automatic mode step-by-step the manual patch method. Consequently, performing patch clamp experiments with the PatchServer automation produces data of the same quality as if manual recording had been used, but provides a higher throughput and is easier to use.

Cell types that can be used for PatchServer automation

Basically, all cell types that can be kept healthy in suspension can be used with the PatchServer. Especially cells similar in size and "behavior" to HEK or CHO cells are easy to work with; the system has been tested intensively and successfully with those cells.

Other cell types might need special treatment and handling to be routinely used with the PatchServer. All parameters relevant for cell catching, sealing etc. can be edited and optimized for specific cell types.

In contrast to other automated patch clamp systems, the PatchServer allows users to visually evaluate each cell before it is patched, thereby minimizing the possibility to record data from unwanted cells. With an optional fluorescence microscope fluorescence-tagged cells can be selected for expression before going whole-cell.



PatchServer: Main advantages

- Automatic establishment of all patch clamp recording configurations (whole-cell and excised patch), utilizing standard glass pipettes and a computer controlled, direct feedback-guided approach
 - Simple handling
 - Less training
 - Easier, faster, and more reliable than manual patch clamp
 - High data quality
- User interrupt possibilities
 - Visual identification and evaluation of cells
 - Automated process can be stopped in any phase
 - Easy switch to manual patching, if desired
- Modular add-on system
 - Existing setups can be equipped with the PatchServer for automation
 - Complete PatchServer automated patch clamp setups can be offered
 - One channel system can be upgraded to four channels
- Multiple, individual recordings
 - One channel version increases ease of use
 - Four channel version additionally increases throughput
- Low operating costs
 - Standard glass pipettes instead of expensive chips
 - Efficient cell usage
 - User can visually identify cells morphologically or with fluorescence before they are patched. This insures that recordings are made only from valid cells, saving time and resources.
 - Part of the unused cells are returned to the CellReservoir, before the recording configuration is established. Less than 500 cells are wasted per recorded cell.



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