

SEC-05 SYSTEMS WITH DHC MODE

General Description

The “Dynamic Hybrid Clamp” (DHC) mode is used for investigations of ionic conductances in voltage clamp (VC) mode following action potentials in current clamp (CC) mode. In CC mode an action potential is detected by a spike detector and triggers a timing unit. This timing unit sets a delay for triggering the SEC (being in CC mode). The SEC switches from CC mode to VC mode with the actual membrane potential as holding potential.

Operation

The DHC mode is set through the MODE OF OPERATION switch (#20 in the front panel view in the User Manual) at the front panel. When the switch is set to DHC, the amplifier is in CC mode and the membrane potential is fed into a sample-and-hold electronic. If a TTL pulse (+5 V) is applied to the MODE SELECT TTL BNC connector (#26 in the front panel view in the User Manual), the SEC is switched to VC mode. The COMMAND INPUT for voltage clamp is disabled and the command potential is provided by the sample-and-hold electronic e.g. the command potential represents the last membrane potential before switch to VC mode.

In practice, the investigator needs additionally a spike detector and a timing unit. The spike detector detects an action potential and triggers – with a delay set by the timing unit – the transition from CC mode to VC mode.

Literature

Dietrich, D., Clusmann, H. & Kral, T. (2002). Improved hybrid clamp: resolution of tail currents following single action potentials. *J.Neurosci Meth.* **116**, 55-63.