

SEC-EXT Headstage for Extracellular Recordings with npi SEC Systems

The SEC-EXT headstage extends the range of operation of SEC amplifiers to the field of extracellular recordings. It has a differential high impedance input stage with capacity compensation for the non-inverting input (+ INPUT) and a gain of ten. This input stage is followed by a high pass filter with six corner frequencies (1; 3; 10; 30; 100; 300 Hz).

- DC output (POTENTIAL OUTPUT of the SEC): The direct output is connected to the "POTENTIAL" channel of the SEC system, i.e. the signal is passed through the OFFSET compensation stage, magnified by ten and filtered by the POTENTIAL FILTER. The overall gain for the DC output is 100 (x10 input stage, x10 SEC potential magnification).
- AC output (high pass output, CURRENT OUTPUT of the SEC): The output of the high pass filter stage is fed into the "CURRENT" channel of the SEC system, i.e. it is passed through the CURRENT OUTPUT SENSITIVITY stage where it is amplified (overall gains 10; 20; 50; 100; 200; 500; 1000). The amplified signal is filtered by the CURRENT FILTER.

Important: The SEC system must be in BRIDGE (B) mode. All inputs must be turned off or disconnected. The BRIDGE balance control must be on 000 to avoid incoming disturbances.

The following systems and front panel elements are working:

CAP. COMPENSATION	Capacity compensation control for the non-inverting (+) input
POTENTIAL OUTPUT	DC output (x100)
OFFSET	Offset control for the DC output
POTENTIAL FILTER	Low pass Bessel filter for the DC output
POTENTIAL DISPLAY	Shows electrode potential x10 (100 are 10 mV)
CURRENT OUTPUT	AC (high pass) output (x10...x1000)
CUR. OUTPUT	Gain stage (10-1000) for the AC output
SENSITIVITY	
CURRENT FILTER	Low pass Bessel filter for the AC output
OSCILLATION	as described in the SEC manual
SHUTOFF	
PENETRATION	"BUZZ" as described in the SEC manual (+I _{max} /-I _{max} do not work)

Important: This headstage is sensitive to static discharges. It is equipped with very sensitive FET amplifiers, which can be damaged by electrostatic charge and therefore, must be handled with care. Damage can be avoided by touching a grounded metal surface when changing or adjusting the electrodes. If a headstage is not used the input should always be connected to ground (either using an appropriate connector or with aluminum foil wrapped around the headstage). **Always turn power off when connecting or disconnecting headstages from the 19" cabinet.**