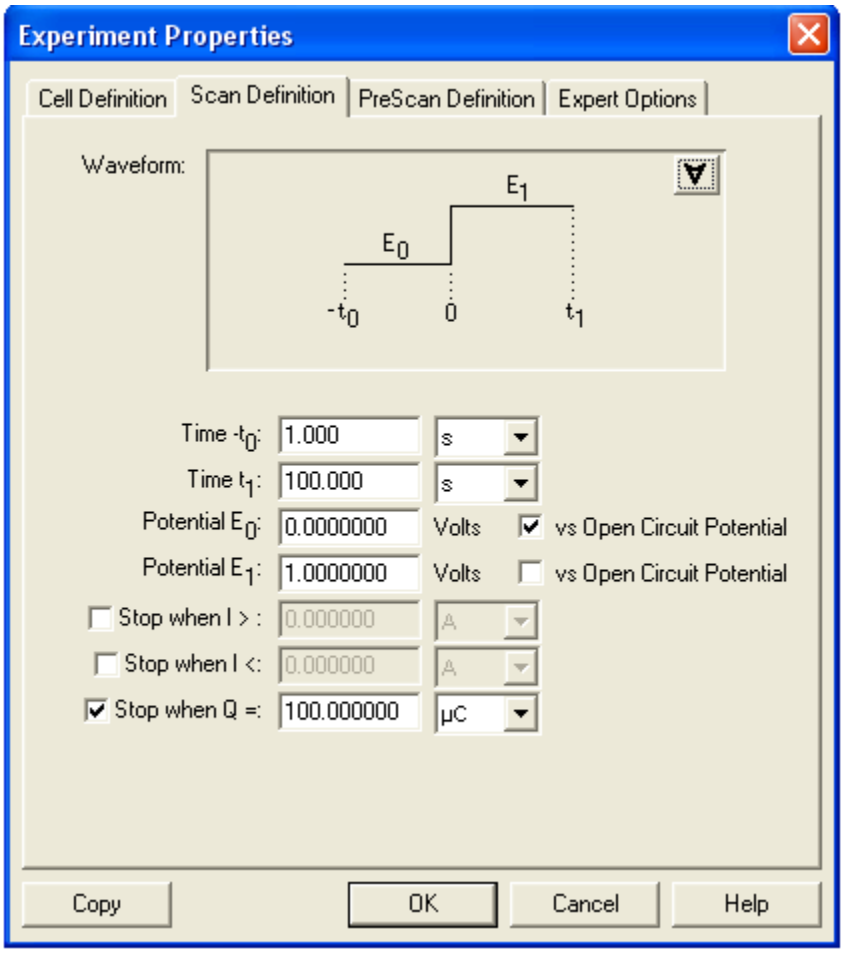
How To Guide

Princeton Applied Research

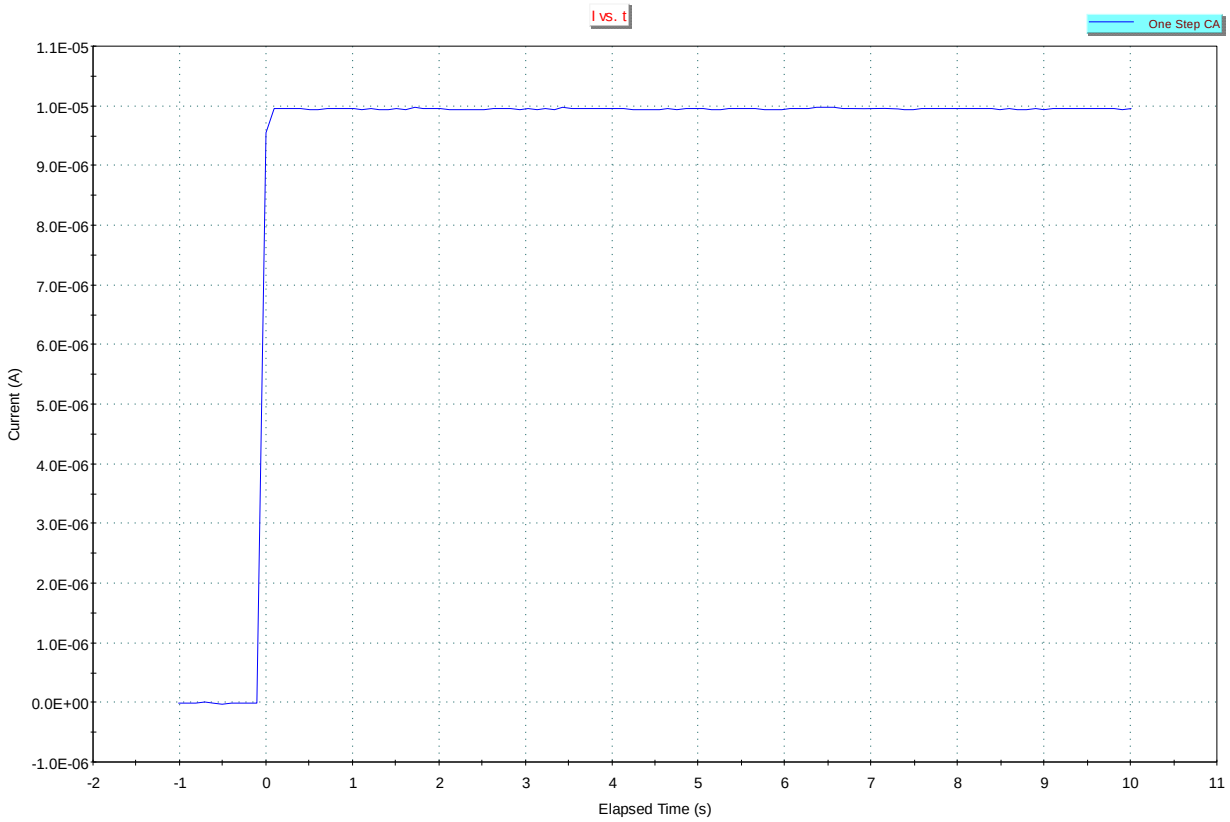
Running a Coulometry Experiment using the Chronoamperometry technique within PowerSuite

The Chronocoulometry (CC) technique within PowerSTEP only supports the PARSTAT 2273. Other PAR potentiostats can run a coulometry experiment using the Chronoamperometry (CA) technique instead. The following is an example showing a single step CA to be performed on a 100Kohm resistor.

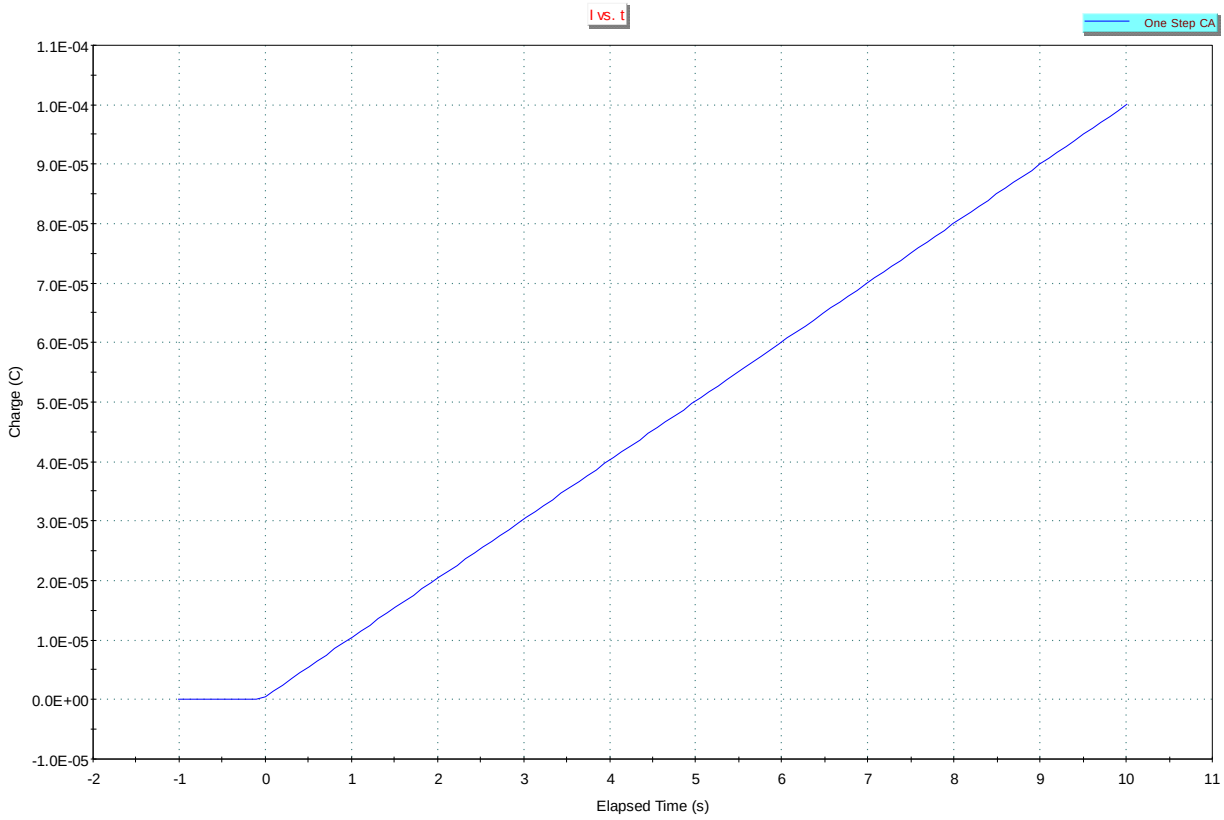


The $-t_0$ is useful for observing the state of the current just prior to the desired potential step. In most cases, the E_0 voltage is set to start at the open circuit potential (in which case the resulting current should be at equilibrium provided the cell is stable at that point). Regardless, the $-t_0$ and E_0 are not considered to be a part of the charge calculation, so no calculation for

charge will be done on this “negative time” data (referred to as “negative time” because it is not to be used in charge calculations).



The experiment was run on a set current range of 10uA. At the $-t_0$ (1s) and E_0 (0V), the currents were basically “bit noise,” that is the lowest resolution for the 10uA range. The step to 1V produced a current of 10uA (with current polarity set to cathodic=negative). Notice that the time stopped at ~10s; this is because of the “Stop On” of 100uC (see graph below).



Upon adding a “Q vs. t” graph (charge vs. time), we see that the charge built up to 100uC after 10s (which it should based on a constant 10uA current), and then the experiment halted even though the experiment time was originally set to go 100s.