Two images below contain slightly idealized ‘real world’ waveforms from Percept/Summit RC+S.

Percept always runs (as of today) in Passive Recharge.  Summit can run in either mode (selectable in the study software).

Key timings:

Delay 2 = 80 usec

Reg Setup = 390 usec

Recharge Period (Passive) ~= time until the next pulse (roughly the period of stimulation less the prior pulse setup/delay)

Recharge Period (Active) = Pulse width.  We do a 1:1 stim/recovery (or activate/inhibit) ratio

Delay 1 (Active) = calculated to make the stim frequency right (so, period – setup+pulsewidth+delay2+rechage width)

To your specific questions (and assuming you want to recreate what Summit RC+S will generate in active recharge mode):

1. For 90 usec, we’d generally set both pulsewidth and recharge width to 90 usec.
2. To deliver a 1 mA therapeutic stim, similarly we’d set both amplitude for the stim phase and the recharge phase to 1 mA for a 2 mA peak to peak swing.
3. Unless there is a reason to do so, we’d likely set the Delay 2 to 80 usec (although this could be a parameter to vary if the goal is to understand the effect of one phase on the other.  Less time means there is less of a chance for the first phase to ‘wear off’)

If you want to recapitulate passive recharge, the goal would be to create a long small recovery pulse.  Perhaps1/4 of the amplitude for 4x the duration, or something like that.  It won’t have the same shape as the passive exponential decay recovery, but it will minimize the cross pulse effects (due to the much lower amplitude).

Diagram

Description automatically generated