TechnicalNOTE

Changing Potentiostat Speed Settings

Introduction

This document describes the software changes that you can make to slow down a Gamry Instruments' potentiostat. Slowing down the potentiostat can improve its stability.

These changes presume a working knowledge of Gamry Instruments' Explain scripting language. The Gamry Framework Tutorial contains an exercise in which you make changes to a script. A review of this material prior to making changes is highly recommended.

In the Gamry Instruments' Framework software, each experimental script has a function known as **InitializePstat()**. This function contains all of the function calls which are made to setup the initial state of the potentiostat. Two of the calls made in the **InitializePstat()** function are **Pstat.SetStability**, and **Pstat.SetCASpeed**.

Pstat.SetStability

The call to **Pstat.SetStability** specifies the stability setting of the I/E Converter. Stability is increased by placing a capacitor across the current measurement resistor.

There are three settings for stability, Fast (0), Medium (1), and Slow (2) with the most stable case being Slow. The Fast value corresponds to no extra I/E converter filtering. The Medium value corresponds to a small I/E filter which enhances stability. The Slow value corresponds to a large I/E filter which removes 50/60 Hz noise in the lower current ranges. While it would take an advanced course in amplifier design to completely understand the stability setting, we can offer you a few guidelines:

1. Always leave the stability in Fast for galvanostatic operation.

2. If the potentiostat is showing high speed oscillation that depends on the current range in use, try increasing the Stability setting.

3. If your curves are noisy at low currents, try setting Stability to Slow.

4. If you are acquiring data faster than 0.2 seconds/point and see glitches when the current range changes, try decreasing the stability.

To change the setting, edit the script as follows: First, save the script under a new name so if anything happens, you are easily able to call up the original script. Second, locate the **InitializePstat** function. It is usually located at the end of the script. Third, make the appropriate changes to the **Pstat.SetStability** line, using the following syntax:

```
SetSwitch = Pstat.SetStability(Switch)

Switch    INDEX    0 = No IE filtering (Fast)

1 = small filter (Medium)

2 = large filter (Slow)

SetSwitch INDEX    The new setting.

Four constants have been set to make the code
easier to read:
      StabilityFast        (0)
      StabilityNorm        (1)
      StabilityMed         (1)
      StabilitySlow        (2)
```

Pstat.SetCASpeed

The call to **Pstat.SetCASpeed** sets a roll off filter on the potentiostat control amp. It can be varied from 0 to 3 with 0 being the fastest speed. The control amplifier roll off affects the overall stability of the potentiostat. As with the **Pstat.SetStability** disclaimer, we can only offer you a guideline in setting the CASpeed. If the potentiostat oscillates on all current ranges change the setting.

To change the setting, edit the script as follows: First, save the script under a new name so if anything happens, you are easily able to call up the original script. Second, locate the **InitializePstat** function. It is usually located at the end of the script. Third, make the appropriate changes to the **Pstat.SetCASpeed** line, using the following syntax:

```
SwitchSet = Pstat.SetCASpeed(Switch)

Switch INDEX Allowed values from 0 (fastest) to 3
(slowest)

SwitchSet INDEX The new setting.
```

Four constants have been set to make code reading
easier:
```
    CASpeedFast   (0)
    CASpeedNorm   (1)
    CASpeedMed    (2)
    CASpeedSlow   (3)
```