

Gas Analysis | DEMS

Technical Information TI-20024.2

## Integration of BioLogic Potentiostat with Hiden HPR-40 DEMS Mass Spectrometer

Cable connection allows Biologic EC-lab to send Trigger, Current and Potential to Hiden Software



Figure 1: The HIDDEN - BioLogic Interface cable

The HIDDEN HA-061-056 3 metre cable provides a connection between the DB9 AUX I/O of a BioLogic Potentiostat and AUX I/O of HIDDEN RC Interface and makes it possible for the Potentiostat to trigger HIDDEN software to start and have Potential and Current values displayed with MS data in real time in HIDDEN software.

### Reading Potential (Ewe) into HIDDEN Software

Potential (Ewe) is available as Analog output using the E monitor pin of the BioLogic DB9 connector. This voltage is sent to Auxiliary 1 of the HIDDEN RC Interface and can be read in all HIDDEN software. The output signal is reversed with respect to EC-lab measured values.

The E monitor facility has a voltage range of  $\pm 2.5V$  centered on the starting voltage of a test. If a test is run that has a voltage spread of more than this range then the monitor will not send correct voltage to the HIDDEN software. It would be possible to cover a wider voltage range by running tests in series.

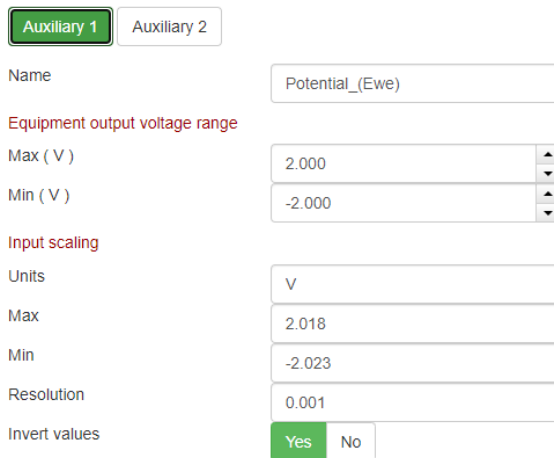
## Reading Current (I) into HIDEN Software

Current (I) is available as Analog output using the I monitor pin of the BioLogic DB9 connector. This voltage is sent to Auxiliary 2 of the HIDEN RC Interface. The current to voltage conversion depends on the I range selected. For a standard board this is +/- 1V.

## Configuration of Auxiliary Inputs

The Auxiliary Inputs must first be configured by following the procedure detailed in Hiden document HA-131-524 'HAL10 Configure Auxiliary Inputs Procedure'.

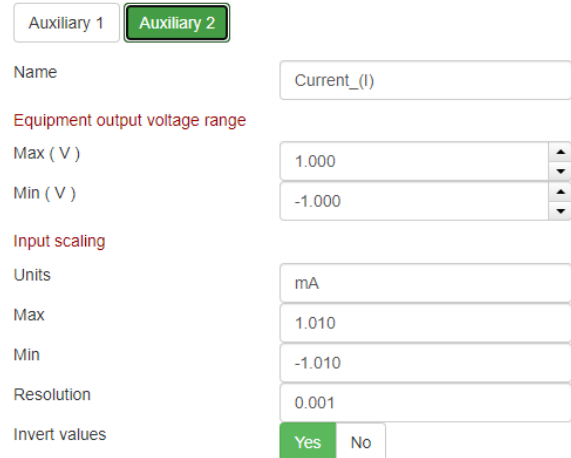
The appropriate values for the auxiliary inputs are detailed below.



The screenshot shows the configuration for Auxiliary 1. At the top, there are two tabs: 'Auxiliary 1' (selected) and 'Auxiliary 2'. The configuration fields are as follows:

- Name: Potential\_(Ewe)
- Equipment output voltage range:
  - Max ( V ): 2.000
  - Min ( V ): -2.000
- Input scaling:
  - Units: V
  - Max: 2.018
  - Min: -2.023
  - Resolution: 0.001
  - Invert values: Yes (selected), No

Figure 2: Auxiliary 1 'Potential\_(Ewe)' setup



The screenshot shows the configuration for Auxiliary 2. At the top, there are two tabs: 'Auxiliary 1' and 'Auxiliary 2' (selected). The configuration fields are as follows:

- Name: Current\_(I)
- Equipment output voltage range:
  - Max ( V ): 1.000
  - Min ( V ): -1.000
- Input scaling:
  - Units: mA
  - Max: 1.010
  - Min: -1.010
  - Resolution: 0.001
  - Invert values: Yes, No (selected)

Figure 3: Auxiliary 2 'Current\_(I)' setup

After re-interrogation, 'Current\_(I)' and 'Potential\_(Ewe)' will be available as an input device and can be added as an external input to EGAsoft or QGA software using the 'Engineering Settings', 'External Inputs' options. Add the device names directly to the External Input box.

## Setting up a Trigger to Start Hiden Software

The Trigger Out signal is sent from EC-lab to Hiden software to start and stop scans.

The trigger should be set up in an EC-Lab experiment with Trigger Out (TO) at the start of the Experiment. TO should be with 'Falling Edge'. The Trigger duration must be set to be > experiment time (including rest). A new experiment cannot be started until the previous trigger duration has elapsed.

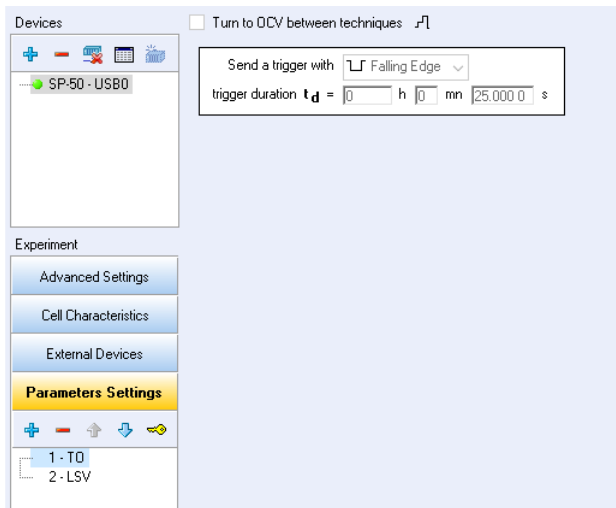


Figure 4: EC-Lab experiment Trigger Out settings

With the 'Triggering' box ticked, EGAssoft can be set to ready mode by pressing Start in the software.

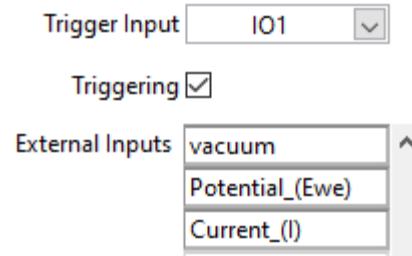


Figure 5: EGAssoft External Input settings

The scan will wait 'on Trigger Start'. The scan can be started and stopped manually using the Trigger Override button.

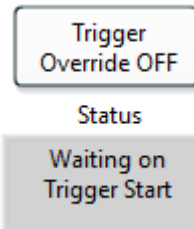


Figure 6: EGAssoft scan status indicator

The EC-Lab experiment can then be started and the EGA scan will begin at the same time. When the TO duration time is reached the scan will stop. If EGAssoft is used to create a sequence then the scan can be stopped and started again by setting up multiple Trigger Out's in EC-lab.

A scan can also be triggered in QGA. For details, use the Help buttons within QGA software.

Chart 1: Example of EGAsoft presentation of MS signal v's Potential v's Time

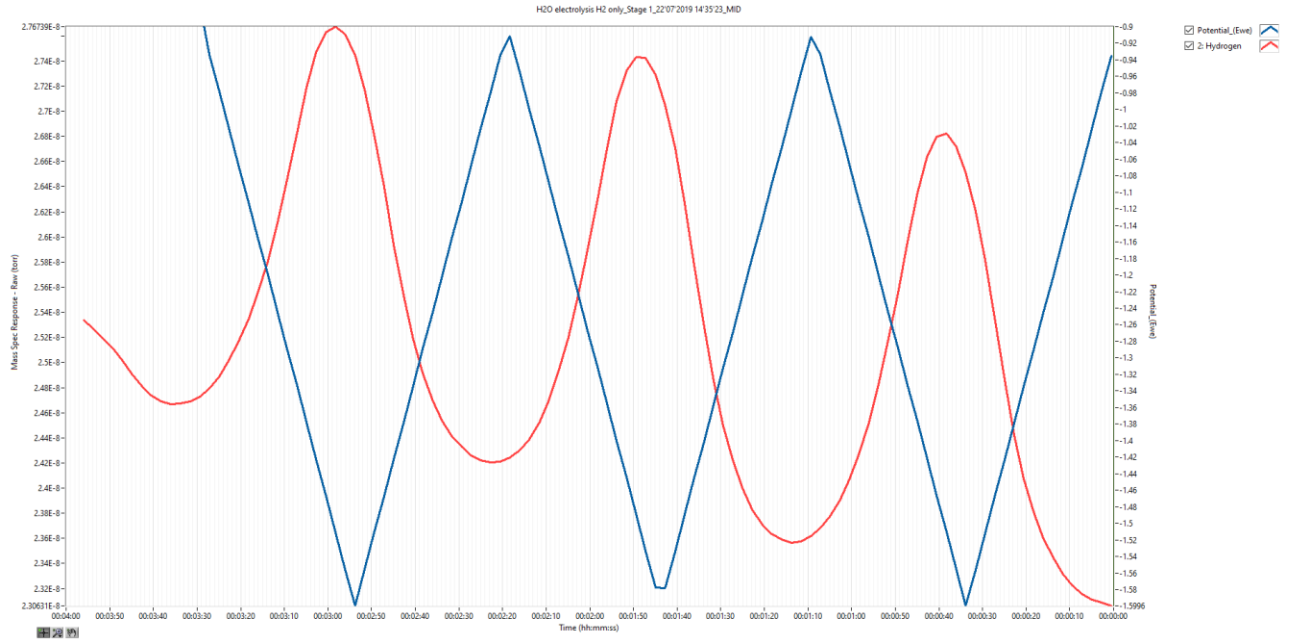


Chart 2: Example of EGAsoft presentation of MS signal v's Potential v's Current

