

Figure 7: Declaring the OrigaBookst (2/5)

4. In the Additional unit list, select OrigaBookst.

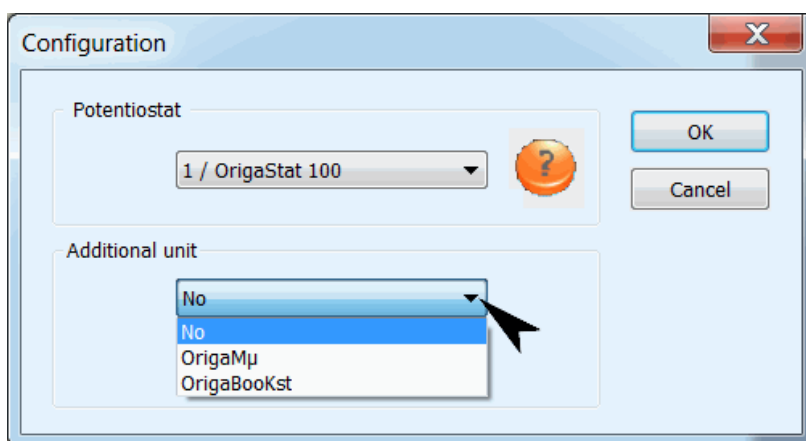


Figure 8: Declaring the OrigaBookst (3/5)

5. Enter the OrigaBookst parameters:

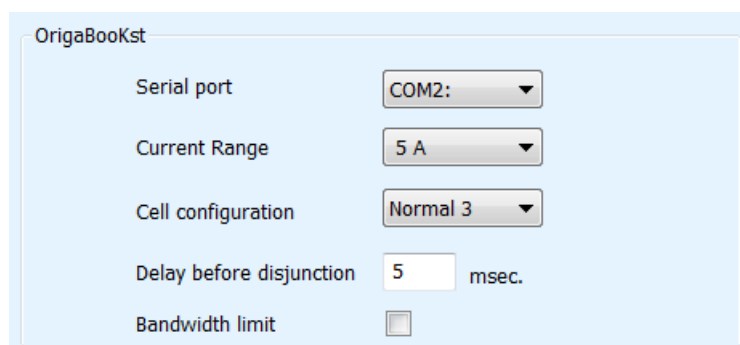


Figure 9: Declaring the OrigaBookst (4/5)

- For Serial port (ref. 1), select the serial port (COM2 or COM3) used on the OrigaBookst for communication with the OrigaStat and the PC. This is the OrigaBookst socket used for connection to the OGS100 or OGS200 (see above paragraph 4).

- For Current range (ref. 2), select the maximum current range of the OrigaBookSt. Depending on the number of power units used it varies from 5 A to 20 A:
 - 5 A with 1 power unit,
 - 10 A with 2 power units,
 - 15 A with 3 power unit,
 - 20 A with 4 power units.
- For Cell configuration (ref. 3), select the type of electrode settings used (Normal 2, Normal 3, Normal 4, Inverted 2, Inverted 3 or Inverted 4). It depends on how the electrodes are connected to the OrigaBookSt.
- Enter the Delay before disjunction (ref. 4)

Usually, if the current measured becomes higher than the range selected, the electrodes are disconnected and the sequence in progress is stopped (disjunction of the system). Nevertheless, you can maintain the electrodes connected for a certain time (Delay before disjunction) if such a current overshoot occurs. By introducing a delay before disjunction, you prevent the sequence from being stopped after a sudden change in potential (or in current) especially when working in the low current range.

As a general rule, leave the value displayed by default (5 msec) and slightly increase the value in case of unwished disjunctions occur.

6. Click the OK button to close the Configuration box.

OrigaMaster 5 checks the instrument connections and displays a communication failure in case of problems.

If the communication is established, then you are ready to edit an experiment with the methods dedicated for your system OGS100 (or OGS200) with OrigaBookSt (5 A, 10 A, 15 A or 20 A).

7. In the menu bar of OrigaMaster 5, tick the Log in option. With this option selected, OrigaMaster 5 will automatically check the presence of an OrigaBookSt with the communication parameters previously entered. There is no need to enter these parameters again.

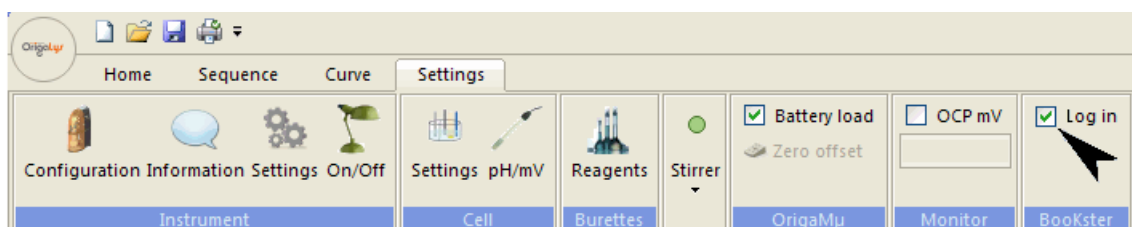


Figure 10: Declaring the OrigaBookSt (5/5)

7. Using the OrigaBookst with a VoltaLab 80

7.1 CONNECTING THE INSTRUMENTS

Connect the main power unit of the OrigaBookst to the PGZ402 of the VoltaLab 80 as follows:

- The 4 BNC sockets (E (X) IN, I (Y) IN, Vg OUT and A/D IN) of the PGZ402 to the Analog I/O socket (ref. 1) of the OrigaBookst main power unit,
- The COM1 serial socket of the PGZ402 to the COM1 serial port of the PC using a standard 9-pin female/9-pin female RS232 serial cable,
- The COM1 serial socket (ref. 2) of the OrigaBookst to the COM2 serial port of the PC using a standard 9-pin female/9-pin female RS232 serial cable.
- The main socket (ref. 3) of the OrigaBookst main power to the mains using the line cord provided.



Figure 11: Connecting the OrigaBookst to a VoltaLab 80

7.2 SETTING UP THE PC SOFTWARE

Run VoltaMaster 4 on the PC then do the following:

1. Select the **File** menu then the **New sequence** command. The Laboratory logbook window of a new sequence is opened.
2. Select the **Settings** menu then the **Instrument setup** command.
If you do not have access to the **Instrument setup** command, it means that the monitor bar is activated. Disable the toolbar as follows: select the **Toolbar** menu then deselect the **Monitor Bar** option.
3. If the PGZ402 is connected to COM1 serial port of the PC, select VoltaLab PGZ402 and Potentiostat (X/Y/Vg). With these settings, the PGZ402 will carry out measurements on its Analog I/O terminals.

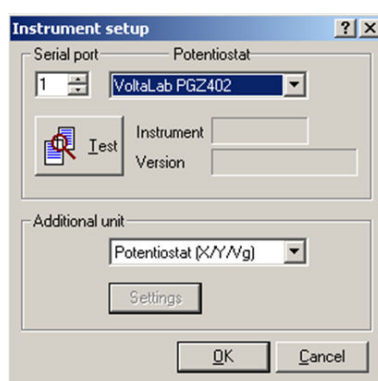


Figure 12: OrigaBookst with a VoltaLab 80 - Instrument setup

7.3 EDITING THE SEQUENCE

The VoltaMaster 4 « Run External Utility » method is used to communicate with OrigaBookst. Several « Run External Utility » are required as they offer a limited set of command lines.

1. Select the **Parameters** menu then the **Sequence edition** command and edit a sequence as follows:

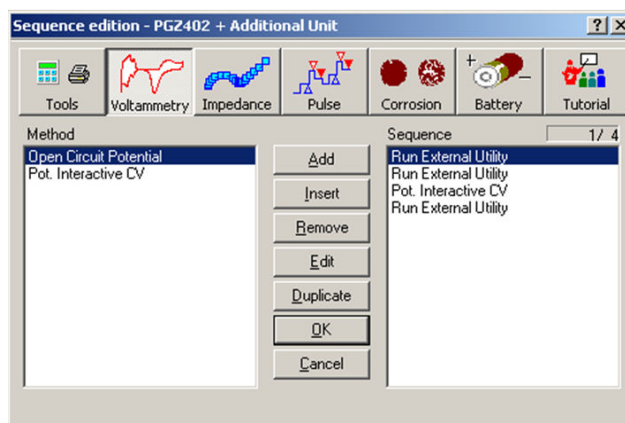


Figure 13: Editing Sequence edition

2. The Settings parameters of each « Run External Utility » method must be edited as shown below. We suppose that the OrigaBookst is connected to serial port COM2 of the PC.

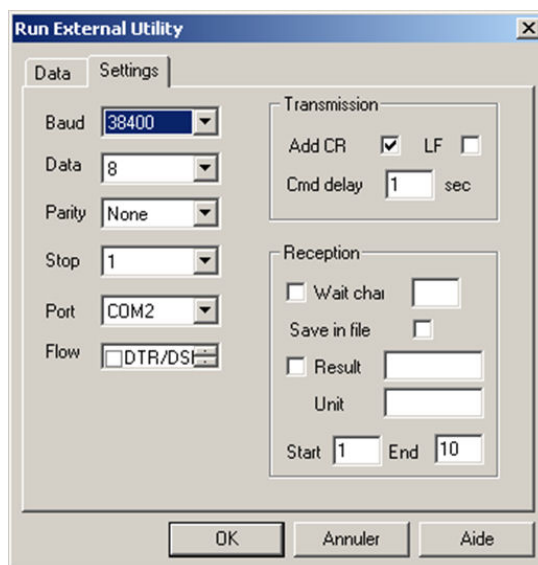


Figure 14: Run External Utility - Editing Settings parameters

3. Edit the Data parameters of the first « Run External Utility » method.
The configuration shown below is constant (does not depend on your instrument) excepted for the « ri xA » command which results from the number of OrigaBookst power units connected (here 1 power unit connected for a current of 5A).

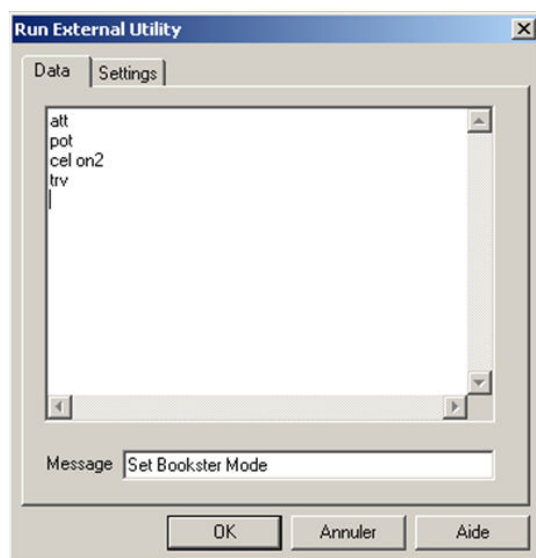


Figure 15: « Run External Utility no.1 » - Editing Data parameters

4. Edit the Data parameters of the second « Run External Utility » method.
 - o Selection of the regulation mode: « pot » for potentiostatic, « gal » for galvanostatic.
 - o Selection of the configuration used for the electrode setup:
 - « cel on2 » : 2 electrodes AUX to GND
 - « cel on3 » : 3 electrodes AUX to GND
 - « cel on4 » : 4 electrodes AUX to GND
 - « cel rv2 » : 2 electrodes WORK to GND
 - « cel rv3 » : 3 electrodes WORK to GND
 - « cel rv4 » : 4 electrodes WORK to GND

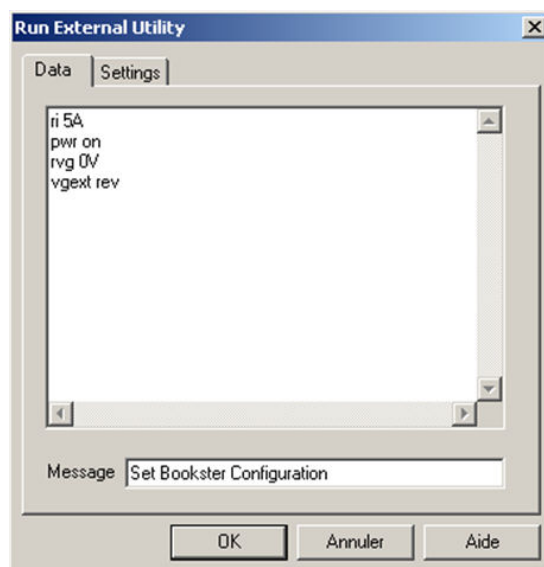


Figure 16: « Run External Utility no.2 » - Editing Data parameters

5. Edit the « Pot. Interactive CV » method.

Warning: The OrigaBookSt imposes 3 times the preset potential programmed.

In the example below, it means that the potential applied will vary 0 à +3000mV.

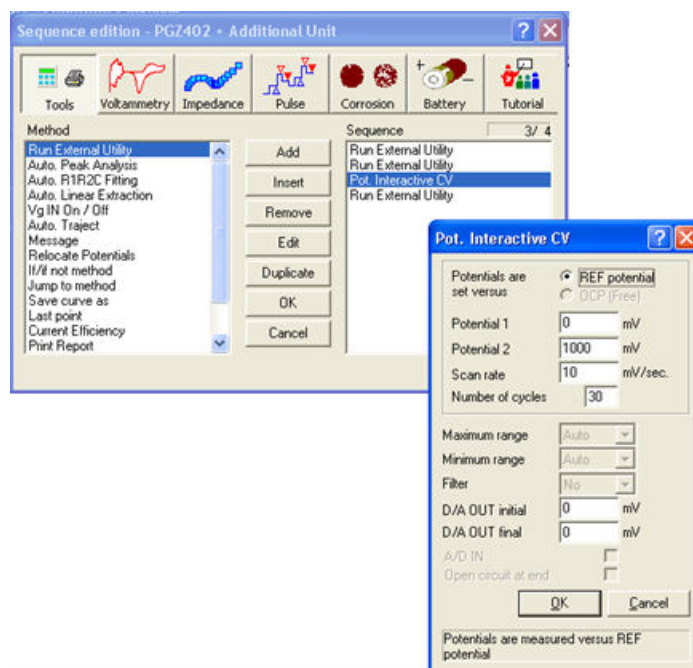


Figure 17: « Pot. Interactive CV » - Editing parameters

6. Edit the Data parameters of the third « Run External Utility » method.
 - the « att » command corresponds to « Open Circuit at end ».
 - the « cel off » command disconnects the electrodes. This command is equivalent to a switching off the "Cell" push button on the PGZ402 front panel.



Figure 18: « Run External Utility no.3 » - Editing Data parameters

7.4 RUNNING THE SEQUENCE

Run the sequence. The following screens are obtained for the 4-method sequence programmed above.

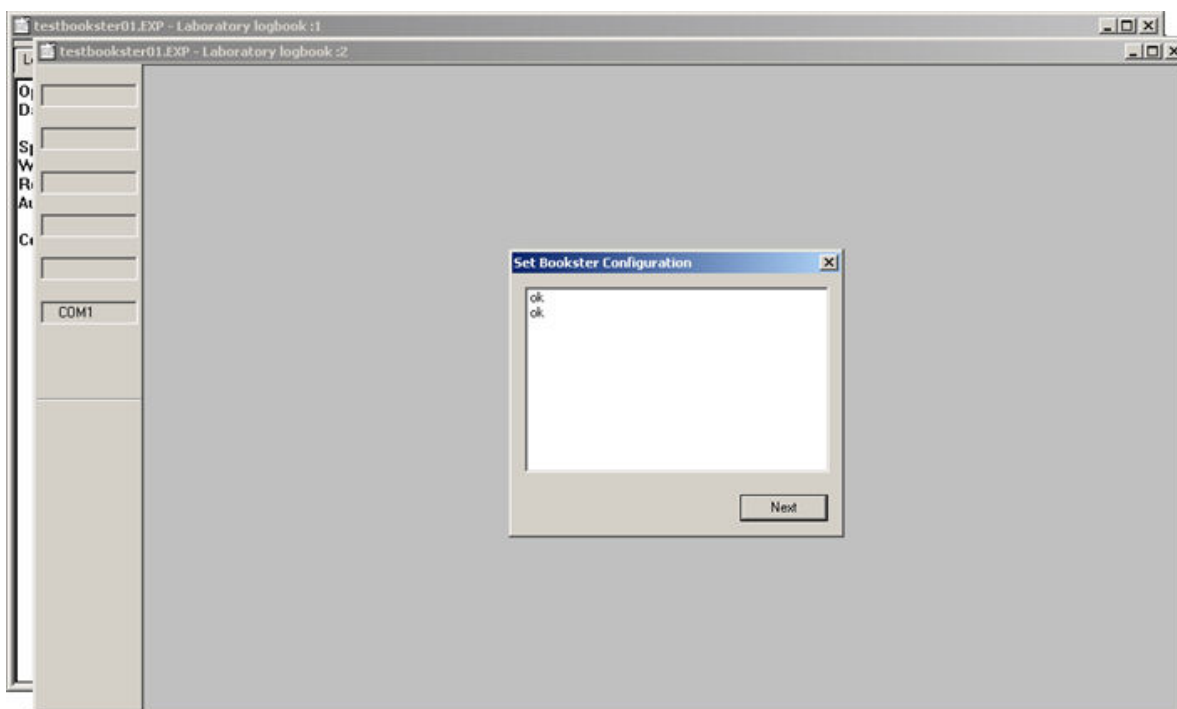


Figure 19: Running sequence (1/4)

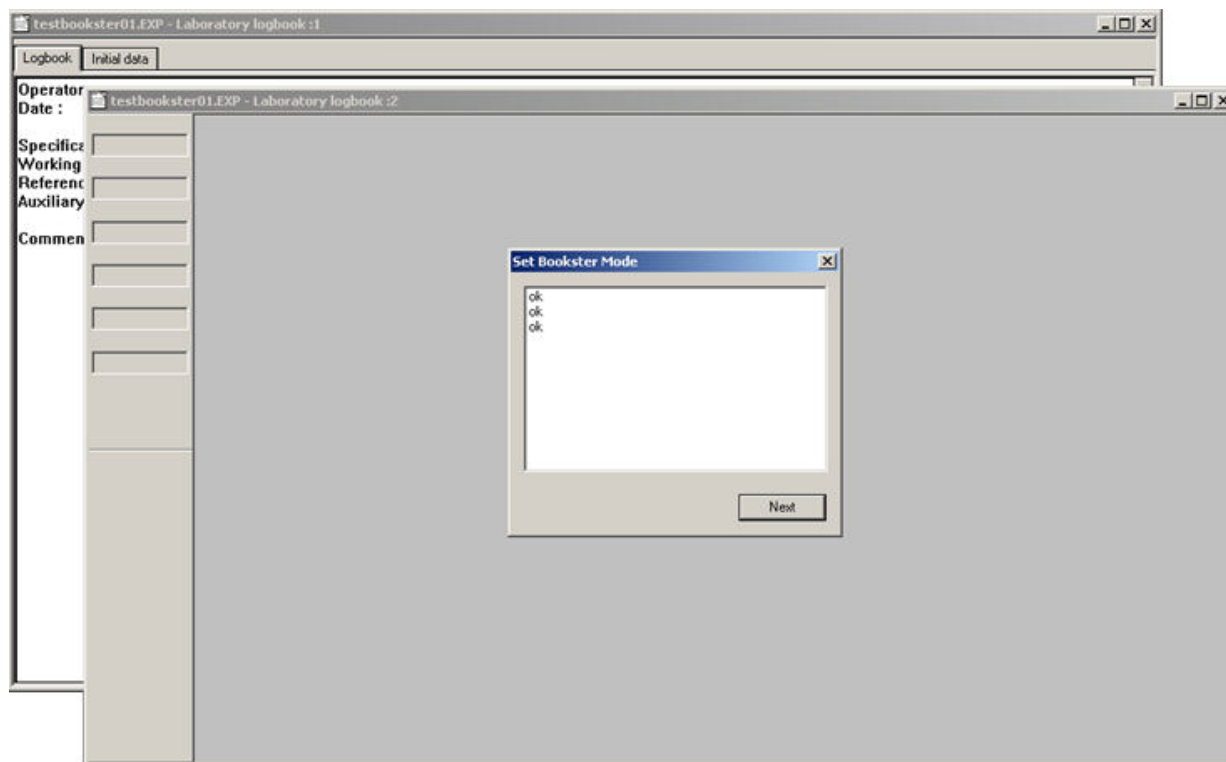


Figure 20: Running sequence (2/4)

Currents and potentials displayed values must be multiplied by a coefficient:

- Currents are to be multiplied by 5 for a 5 A OrigaBookst,
- Currents are to be multiplied by 10 for a 10 A OrigaBookst,
- Currents are to be multiplied by 15 for a 15 A OrigaBookst,
- Currents are to be multiplied by 20 for a 20 A OrigaBookst,
- Potentials are to be multiplied by 3 whatever the OrigaBookst in use.

In the following example displayed below:

- The current measured is equal to $511.6 \text{ mA} \times 5 = 2.558 \text{ A}$
- The potential imposed is equal to $870 \text{ mV} \times 3 = 2.61 \text{ V}$

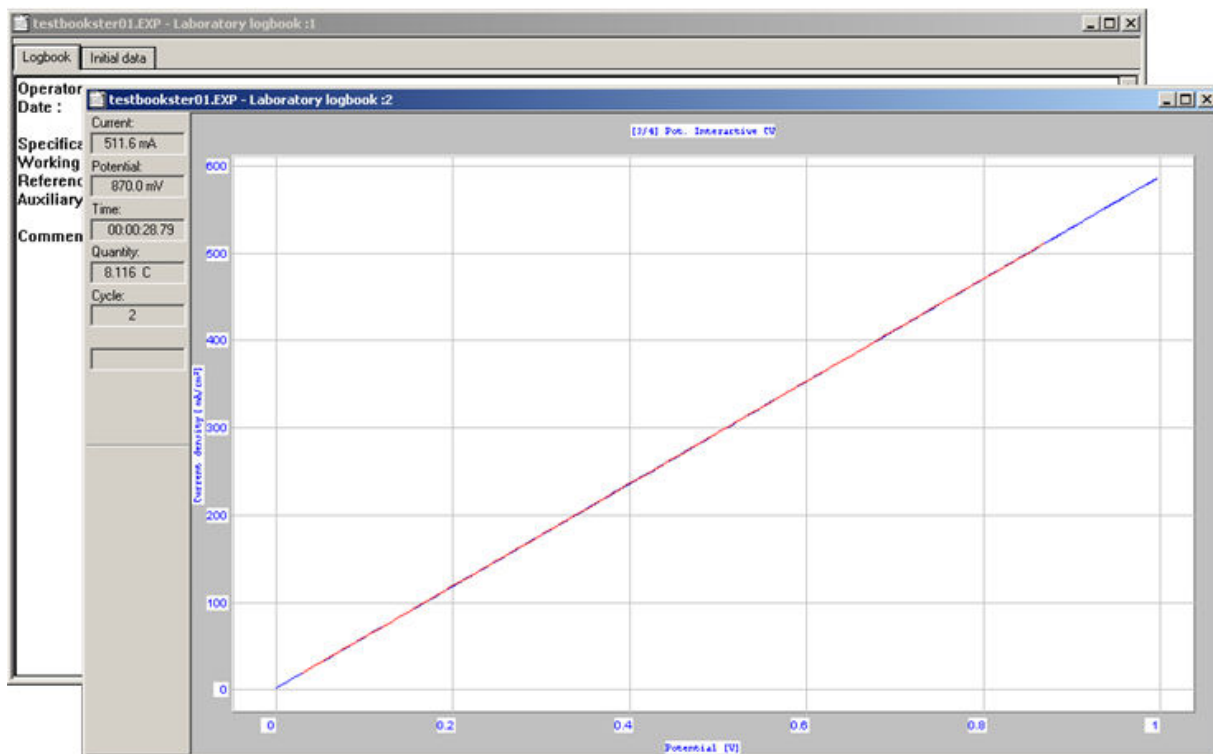


Figure 21: Running sequence (3/4)

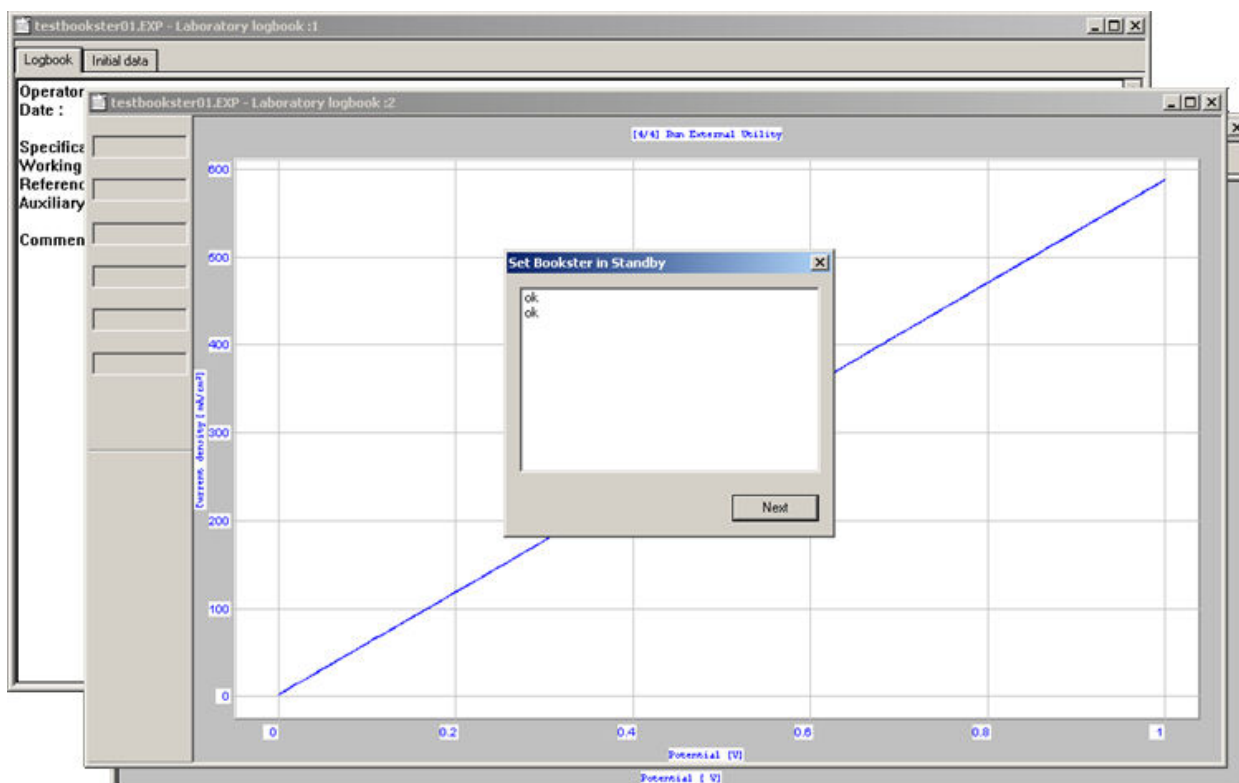


Figure 22: Running sequence (4/4)

7.5 THE RS232 COMMANDS

7.5.1 RS232 Format

At powering on the system, the default RS232 parameters are:
38400 bauds, 8 data, One Stop Bit, No parity

7.5.2 Syntax of the RS232 commands

Notes:

The command characters string is defined within brackets [cmde].

All commands end with a <cr> (code ASCII 13)

- **Identification**
 - [hello] : initiates communication with the master device (Answer boost)
 - [ver] : Prints date and time of the software version
 - [hard] : Prints PCB and processor references
 - [maker] : Prints Manufacturer name
 - [product] : Prints Product name
 - [SN] : Reads in flash the serial number (PL+RN) of instrument
- **Configuration of OrigaBookSt**
 - [pwr c] : Switch on/off the power units
 - [ri x] : Selection of the I current (GamI_x)
 - [ovlit n] : Delay before disjunction (10 - 30000 ms)
 - [aos c] : Anti-oscillation filter system (off / on)
 - [sum c] : Coupling 2 OrigaBookSt (off / on)
- **Configuration of measurement cell**
 - [cel x] : Cell Configuration (Cellule_x)
 - [pot] : Potentiostatic regulation mode
 - [gal] : Galvanostatic regulation mode
 - [att] : Standby mode
 - [trv] : Working mode
- **Pilot generator**
 - [rvg x] : Pilot range (VgINT_GamX)
 - [vgext x] : Configuration of external pilot generator (VgEXT_x)
 - [vgd n] : Pilot DC voltage (in volt)
 - [igd n] : Pilot DC current (in mA)
- **Status**
 - [imax] : Reads back the current available depending on the number of power units detected
 - [pwr?] : Reads back the powering status of the power units
 - [ri?] : Reads back the I current range in use (GamI_x)
 - [mod] : Reads back the regulation mode in use (POT / GAL)
 - [trv?] : Reads back the mode in use (off / on)
 - [rvg?] : Reads back the pilot range in use
 - [vgext?] : Reads back the configuration of the external generator in use
 - [alm] : Reads back the alarm status (alm_XXX)
 - [clrAlm] : Resets the alarms to zero
- **Measurements**
 - [m c] : Mesures the E(mV) and/or I(mA) and/or Vs(mV) and/or Rth(ohms) (1 to 4 parameters separated by a spacing character)

7.5.3 Syntax of the RS232 parameters

- Type [... c]: Characters string
- Type [... x]
 - Cellule_x: off / on2 / on3 / on4 / rv2 / rv3 / rv4
 - GamI_x: 5A / 10A / 15A / 20A
 - VgINT_GamX: 0V / 1V / 15V
 - VgEXT_x: off / dir / rev
- Type [... n]: Numerical data

7.5.4 Syntax of the RS232 answers

- "syntax error"
- "argument error"
- "parameters number error"
- "context error"
- "ok"
- "boost"
- "Fatal error: Undefined Response"
- Type alm_xxx : 48 characters max (with <cr>)
 - "ok"
 - "I=OVL"
 - "I=OVL,E=OVL,Vs=OVL,BASE=ThermBRK,POWER=ThermBRK"