

Installation notes for IviumBoost

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1. IviumBoost: hardware description



Front view



Rear view

1.1 Device description

The IviumBoost is a current booster for the IviumStat and will increase the maximum current of the IviumStat. Two models are available:

- maximum 20A at $\pm 20V$
- maximum 40A at $\pm 10V$

The 20A&20V version can be used at its full range in combination with the IviumStat.XR. The 40A@10V can be used optimally with either the IviumStat or the IviumStat.XR.

1.2 IviumBoost specifications

- The IviumBoost is available in two models:
 - 20A@20V
 - 40A@10V
- potentiostatic 0V capability
- Bandwidth > 100 kHz
- w x d x h = 47x36x14 cm; 16 kg
- 100-240V, 50-60Hz, 1000W

Note that the device specs are including the cell cables, but excluding the appendages for connecting the cables to the test subject.

1.3 Safeties and alarms

The IviumBoost is a very powerful device which is capable of high power outputs. In order to protect the user and the test subject as well as the device itself, the booster is equipped with a variety of electronic safeties, some of which have LED alarm indicators.



Front view LED display

Located at the front of the IviumBoost is an indicator window that contains 8 LED indicators in two columns of 4:

Indicator	Shows when:
E+ ovl [orange]	potential range positive maximum is reached
E- ovl [orange]	potential range negative maximum is reached
I ovl [orange]	current range maximum is reached
Cell on [green]	cell is electrically connected
E max [red]	positive power supply overload
E min [red]	negative power supply overload
Temp [red]	temperature maximum inside IviumBoost is exceeded
Osc [red]	an oscillation of the electrical signal in the electrometer occurs

The [orange] LEDs show a warning that a range maximum has been reached. The [red] LEDs show that a terminal condition has occurred and subsequently automatically the cell has been disconnected and the measurement has been terminated. When a new measurement starts the IviumBoost is automatically reset and the indicator will switch off.

When a (unforeseen) situation occurs where it is desired to protect the test subject/substrate from the reigning electrical conditions, an (emergency) manual override is possible. The cell will be instantly isolated from the IviumBoost by pressing the red "Disconnect" switch located at the bottom right on the front of the IviumBoost.

2. Connecting the IviumBoost to the IviumStat

To connect the IviumBoost to the IviumStat:

1. take the 40 cm M/F HD15 cable. Insert the M-side into the Cell-connector of the IviumStat. Insert the F-side into the IviumStat connector.
2. Connect the RE/S cable to the RE/S connector.
3. Connect the (heavy) WE/CE cable by inserting the plug so that the notch and the slid line up. Then turn the plug clockwise until it clicks in place. (To unfasten, pull the silver button and turn the plug counter-clockwise).
4. Connect the power cable
5. switch on the IviumBoost
6. switch in the IviumStat

Note that the IviumBoost can only be operated in the 4-electrode mode. The RE and S leads need to be connected.

3. Software instructions

3.1 Download latest version of the IviumSoft

The latest version of the IviumSoft can be downloaded at:

<http://www.ivium.eu/files/IviumSoft.zip>

This will give you the latest version of the IviumSoft.exe. Replace the one in your C:\Iviumstat-filedirectory with this one. Then open the IviumSoft and upgrade the firmware of your IviumStat (for ref. see User Manual).

3.2 Configuring the IviumStat

By default the IviumStat is configured to operate stand-alone. In order to operate the IviumStat with the IviumBoost the configuration needs to be changed. To do this:

- Go to "Options" in the menu bar.
- Choose the "Settings" tab-page.
- Tick the relevant radio button for either the 20A or 40A model.
- Tick the box in front of the IviumBoost
- Close the window.

In the direct-mode of the IviumSoft it can now be seen that only the 10A current range is available. If lower current ranges are desired one should disconnect the IviumBoost.

When the IviumBoost is disconnected the IviumStat should be returned to the stand-alone mode:

- Go to "Options" in the menu bar.
- Choose the "Settings" tab-page.
- Untick the box in front of the IviumBoost
- Close the window.

4. Calibration of the IviumBoost

To calibrate the combination IviumStat-IviumBoost for optimal accuracy at the given current range of 10A of the IviumBoost proceed as follows:

- **IMPORTANT:** Press the red "Disconnect" button on the front of the IviumBoost, so that it lights up red.
- In the IviumSoftware go to "Tools" in the menu bar and select "Device maintenance"
- At the bottom-left in the pop-up window click on "Booster offset". This will induce a number of clicks in the devices followed by a beep in the IviumStat indicating that the devices have been calibrated¹.
- De-press the red "Disconnect" button on the front of the IviumBoost, so that the lights extinguishes.
- Close the pop-up window and commence working.

¹Note that the calibration of the IviumBoost is done with all the cell relais closed (hence the clicking noise during the calibration procedure). After measurements all cell relais will be opened to return the IviumBoost to default mode. This means that the value for the current that is displayed in the IviumStat window as well as in the software "Direct mode" tab page may be different from the calibrated value. Nevertheless, in all measurements the calibrated value is used.

5. Cell cable connections

The IviumBoost is capable of outputting high currents and high powers. In order to guarantee the best measurement results, the current carrying cables of the WE and CE have been separated from the potential measurement cables RE and S. It should be noted here however, that the IviumBoost can only be operated in the 4-electrode mode. The RE and S leads need to be connected.

The WE and CE electrode cables end in an o-ring for fastening to the testsubject. The shipment of the IviumBoost includes several appendages for connecting the cell cables to the test subject. The gold plated bananas can be attached to the o-ring of the WE or CE cables by unscrewing the back of the banana and re-fasten it through the o-ring. *Do not use other banana's*, because these gold plated banana's are especially assembled to be spec'd at 50A.

To attach the battery clips to the WE or CE electrode cables, remove the handle insulation of the battery clip. Fasten the electrode cable o-ring at the bolt in the handle, and re-attach the handle insulation.

The RE/S cable includes the ground cable. All end in a banana-plug. The RE and S should be connected to the appropriate contacts of the test subject (or the WE and CE leads). These cables do not carry any current and can be connected using the crocodile clips that are included in the IviumBoost shipment.