Appendix: Working with the Science Brick

The Science Brick is used for real-time exporting of data to instrumentation amplifiers, and generation of external triggers off the respiratory trace, for example, a trigger on inhalation onset or offset or a trigger on exhalation onset or offset.

What does it come with: The Science Brick comes with a cable allowing you to connect it to your computer's USB-A port.

What else will I need in order to use this:
1. A Sniff Logic acquisition device, either Sniff Controller Basic, Sniff Controller Air, or a Nasal Holter.
2. A computer, desktop or laptop, with a USB-A port.
3. BNC cables to link to instrumentation amplifier and other external devices

Description: The Science Brick is a scientific research instrument. Using the SniffScience software, it allows you to export the respiratory signal as an analogue signal (±5V), via BNC connectors, to an instrumentation amplifier.

You can use a Sniff Controller Basic connected to the computer via USB, or a Sniff Controller Air and Nasal Holter connected to the computer via Bluetooth. The SniffScience software will acquire the signal from the device, and export it via the Science Brick. This can allow saving respiratory data time-locked to other signal acquisitions, such as EEG.

The SniffScience software allows you to select points on the respiratory trace to act as triggers. When these points are materialized in the data, this generates a TTL trigger, that you can select as either pull-up or pull-down. This feature can be used in diverse settings. For example, in olfaction research you can have an olfactometer trigger an odor exactly at sniff onset. In emotion research you can present a stimulus at different phases of the respiratory trace, on inhalation, exhalation, or anywhere in between. The Science Brick has four independent trigger lines, all with BNC connections.

Setting up the Science Brick:

If you plan on using the Brick in your experiment, it should be set up prior to launching the software.

1. Make sure the switch located at the side of the Science Brick is always ON.
2. Connect the Science Brick to a USB port. This should be accompanied by the operating system chyme sound similar to detection of other USB devices (e.g. thumb drives etc.). The system will allocate a COM port for the Science Brick.

NOTE: If you are using A Sniff Controller Basic, by now you should have it connected via USB as well. Notice that the Sniff Controller is allocated a different COM port than the Science Brick.

3. Launch SniffScience Desktop
4. Start a new recording session.
5. Go To the 'Manage Brick' window.
6. Select the Science Brick's serial port from the dropdown menu.

IMPORTANT! When a Science Brick's correct COM port is selected, it will begin flashing the green LEDs on the front panel when triggers are sent. This is a good way to verify the correct COM port was selected.

If for any reason you need to restart any of the components (hardware or software), it is advised to repeat steps 1-6 in order to ensure the Science Brick will function properly.

Science Brick management user interface:

Terminology and operationalization of triggers 1-4 in respect to respiratory phase