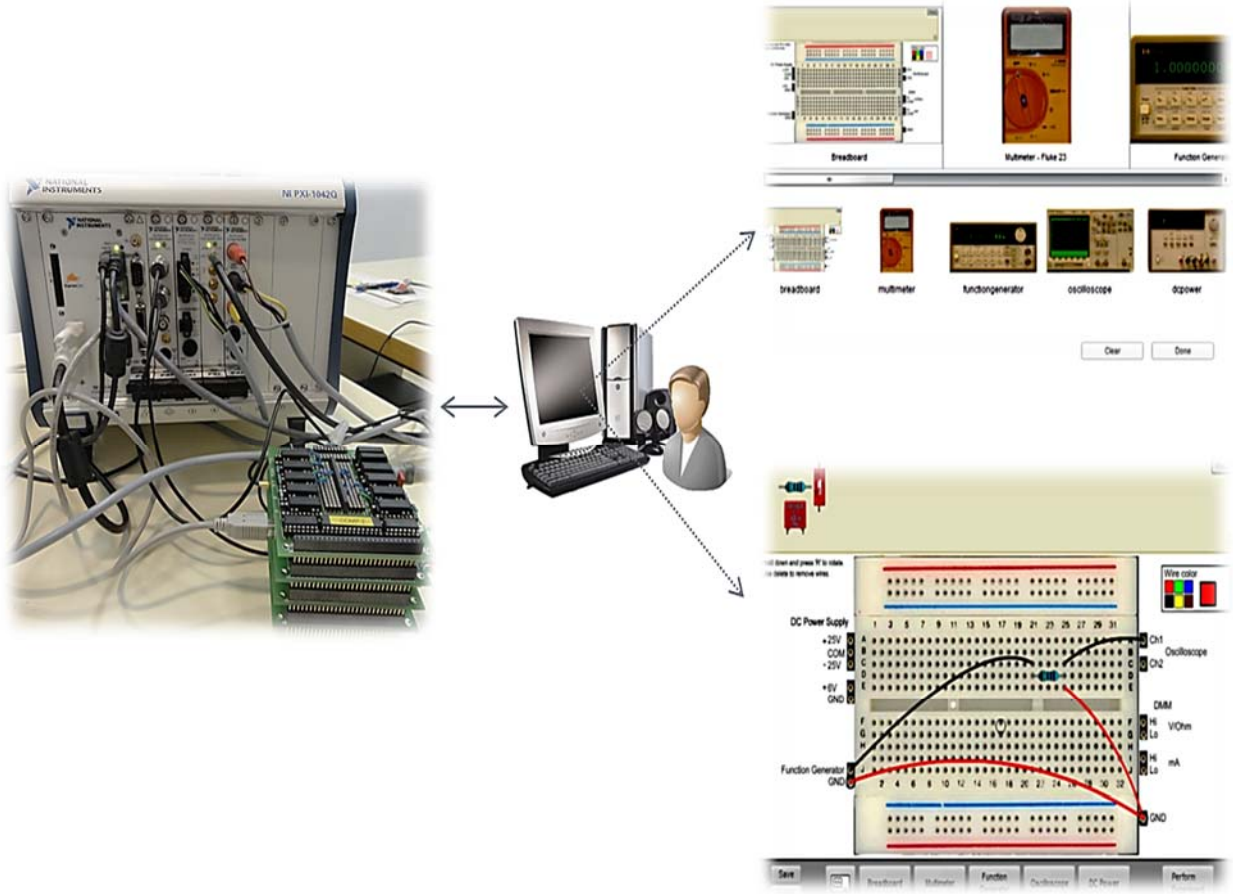
Electrical & Computer Engineering Department-DIEEC
Spanish University for Distance Education-UNED

# Virtual Instrument Systems in Reality (VISIR)




***User Manual***

Virtual Instrument Systems in Reality (VISIR) is a remote laboratory for wiring and measuring of electronic circuits. The VISIR Project was initially founded by the Signal Processing Department (ASB) at Blekinge Institute of Technology (BTH) in Sweden together with National Instruments in the USA (as a supplier of instruments) and Axiom EduTECH in Sweden (as a supplier of education, technical software, and engineering services for noise and vibration analysis) at the end of 2006. So far, six universities have already implemented VISIR after Blekinge Institute of Technology:

1. FH Campus Wien for Applied Sciences in Austria.
2. Carinthia University of Applied Sciences in Austria.
3. University of Deusto in Spain.
4. Spanish University for Distance Education (UNED) in Spain.
5. Polytechnic Institute of Porto (ISEP) in Portugal.
6. Madras Institute of Technology (IIT-M) in India.

As shown in Figure 1, the student logs into the Web page and design his circuit in a simulated environment. Once, he/she clicks on the button "perform experiment", his/her design is transmitted to the measurement server in order to be verified before being transmitted o the equipment server for execution on real equipment. The instruments consists of a PXI platform (Oscilloscope, multi-meter, Power supply, and function generator) connected to a relay switching matrix in which the components are connected.

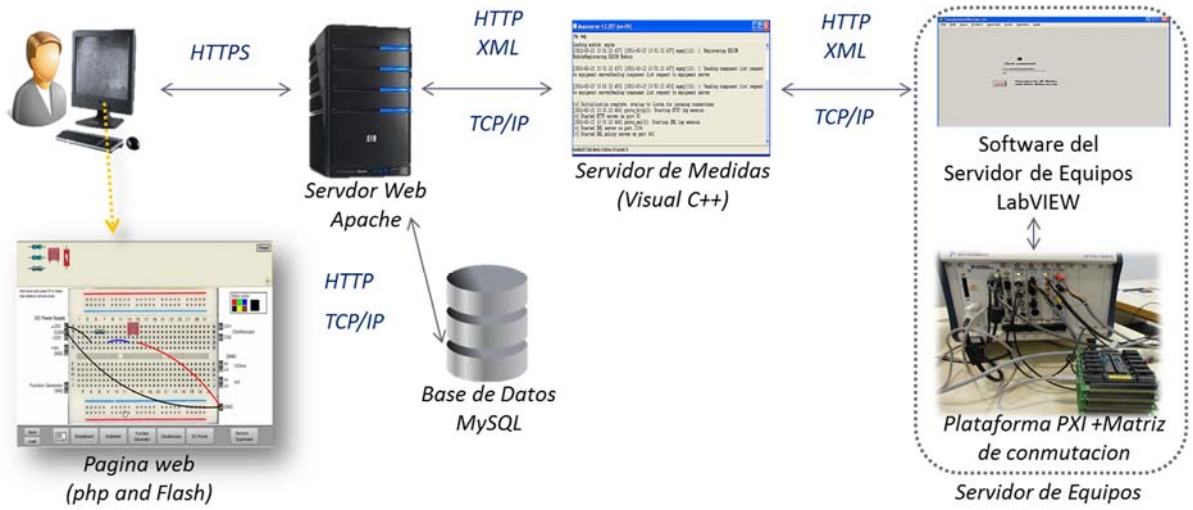



Figure 1. VISIR operation cycle.

In order to Access VISIR: enter the following URL from any Web browser http://visir.ieec.uned.es/ and click on login in order to enter your username (email) and password (previously provided by the teacher), Figure 2.

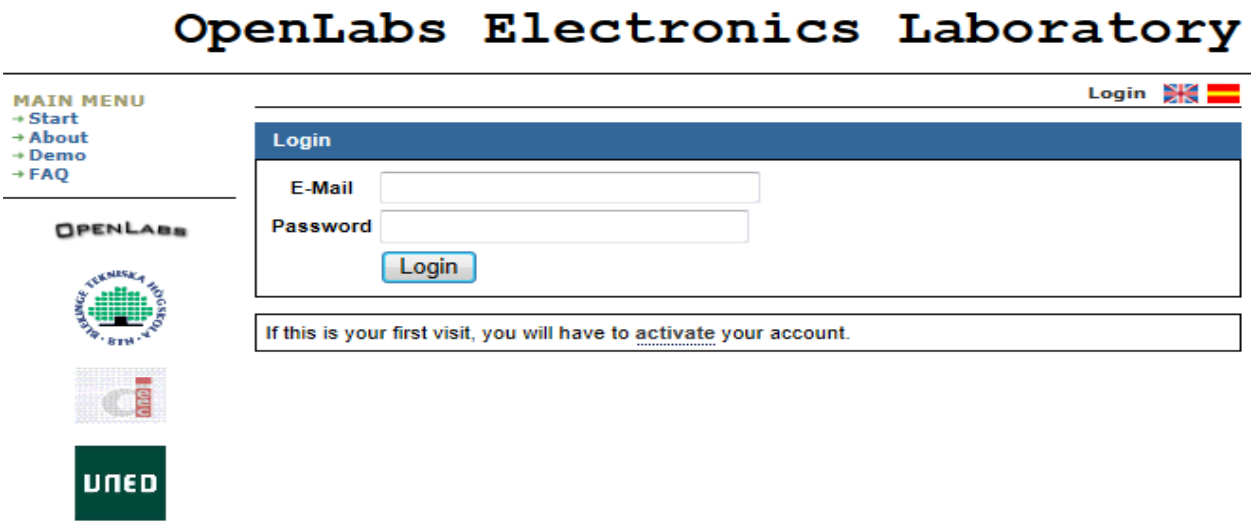



Figure 2. Access Portal.

You will see under "STUDENT" the courses in which you are enrolled or you are granted access, Figure 3.

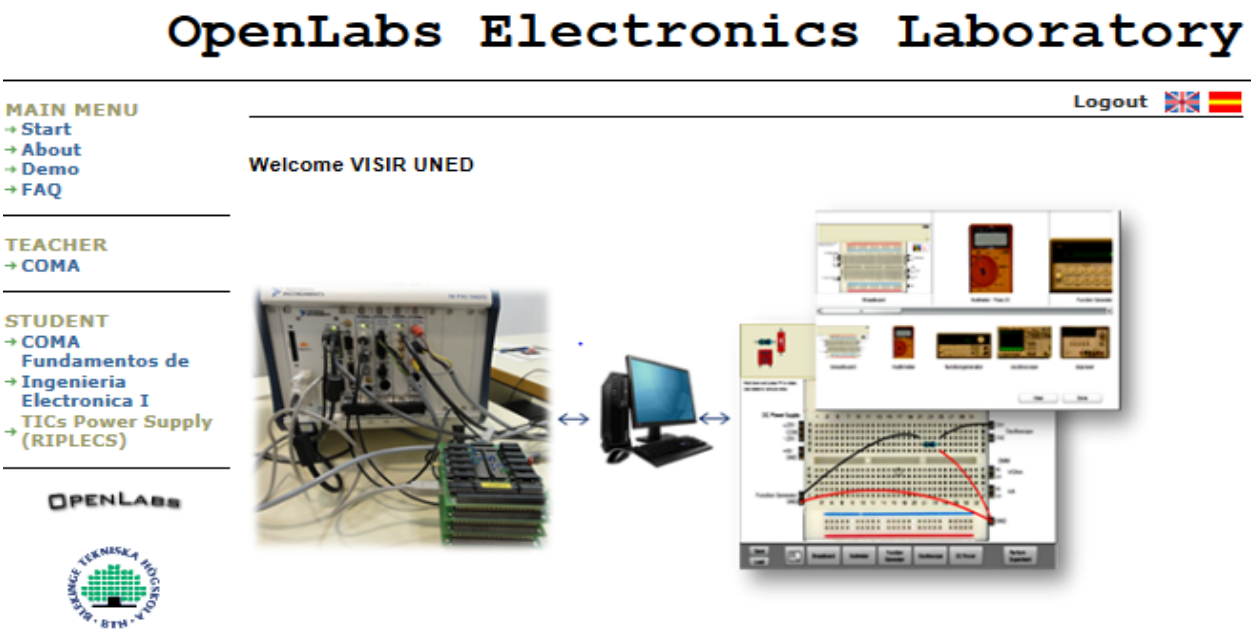



Figure 3. Student portal.

As shown in Figure 4, under the 'STUDENT', all courses in which student enrolled are appearing (Assigning students to a course is carried out by the teacher of such course). Once the course is chosen, click "start Experimenting" to access the lab workbench.

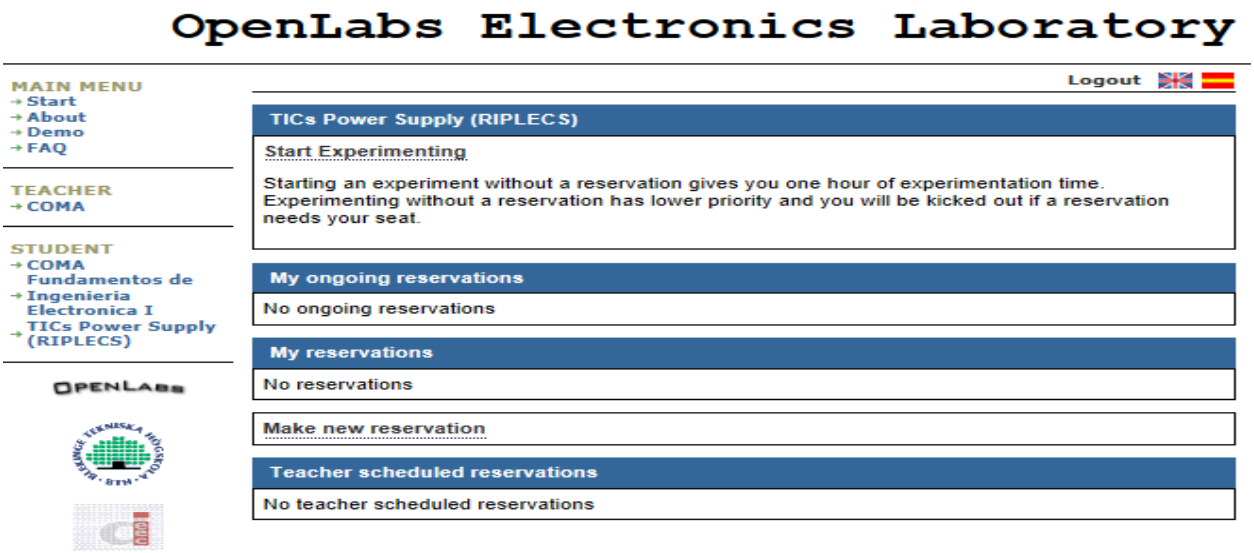



Figure 4. RIPLECS course portal.

As shown in Figure 5, the interfaces of the available instruments are shown. Student are free to choose the interface with which he/she is familiar. However, it is recommended to leave the default interfaces as they include are the functions available in VISIR. Next, click done to enter the virtual workbench.

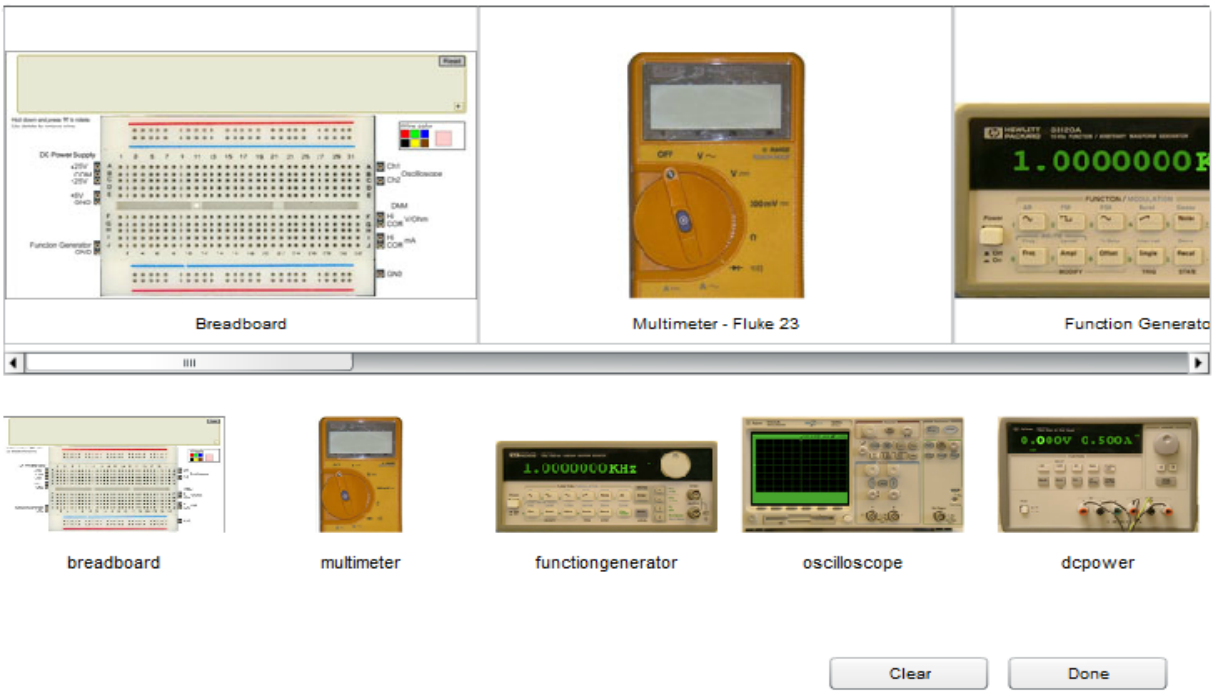



Figure 5. Instrument interfaces.

The virtual workbench is shown in Figure 6. The prepared exercises by the teacher are shown below the virtual workbench. By clicking on any exercise, the available components of such exercises will appear in the component zone. Student is free to drag and drop the component by the mouse and wire the circuit by choosing the wire color. The terminals of the instruments are shown on both sides of the breadboard.

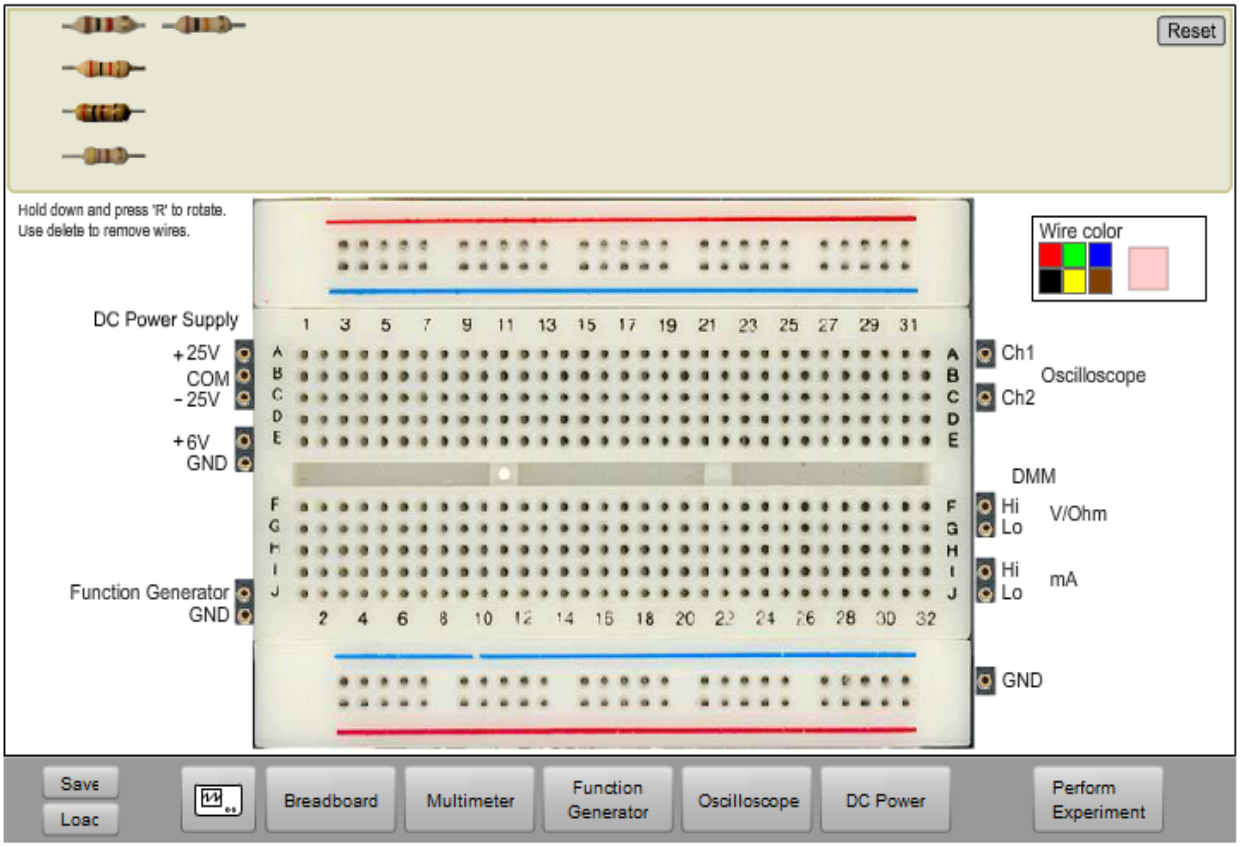



Figure 6. Virtual workbench.

Each instrument has its own interface for configuring it. Access to the interface of each instrument is done by clicking its corresponding button below the virtual breadboard. For example, the interface of the power supply is shown in Figure 7. After wiring the circuit, press the “perform experiment” button to see the results on the instrument interfaces.


Figure 7. Power supply interface.

An example of a mounted circuit can be shown in Figure 8.

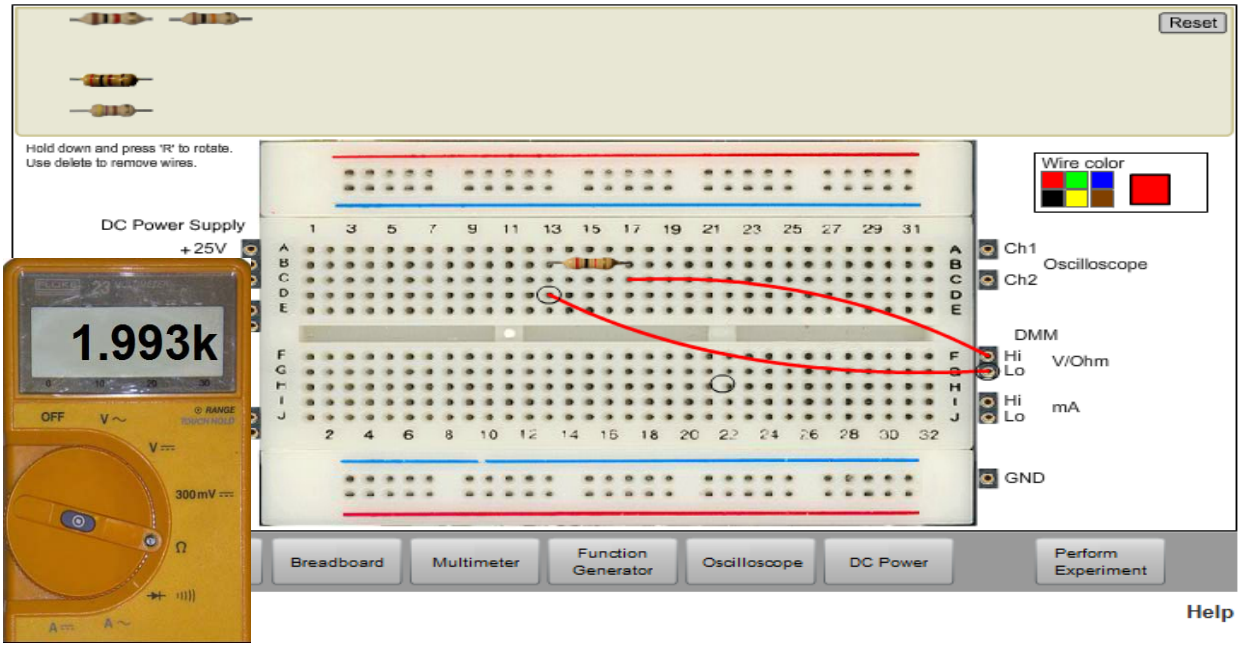



Figure 8. A simple example of a resistor measured by a multi-meter.

If all the connections are correct, the results will appear on the interfaces of the instruments, and if not, an error will appear as shown in Figure 9.

. Connection error.

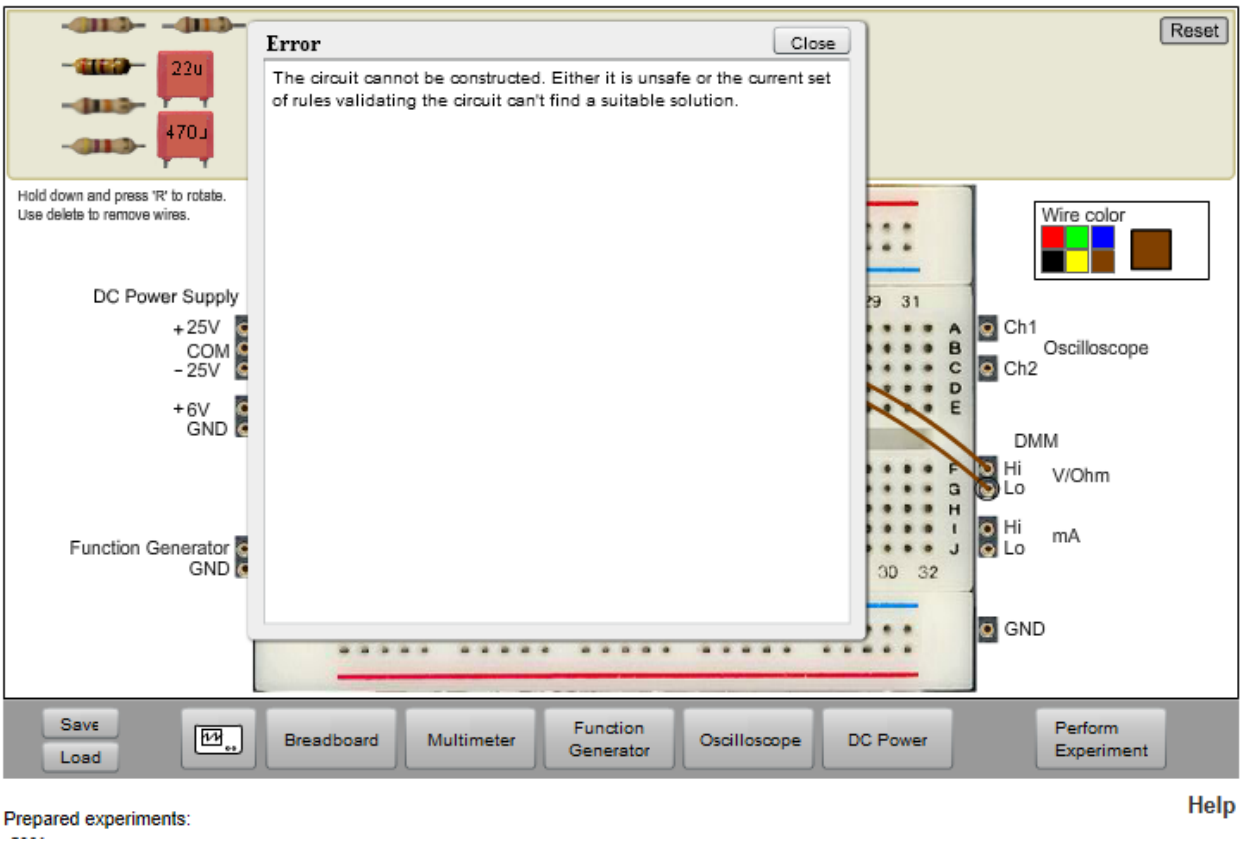



Figure 9. Connection error.

# FAQ

1. **I login and enter the workbench but I can't see anything.**

This could be because of the Flash plugin is not installed in your browser. You can install it from http://www.adobe.com/es/products/flashplayer/

2. **I get an error when I click "perform experiment"**

This could be because of various reasons: the connections are not correct (VISIR restrict students to certain connection). Make sure that the connections are correctly realized in the right holes of the breadboard. Try it again, it could be because of the extra load.

3. **The Oscilloscope is not measuring correctly.**

There could be three possible reasons: 1) you didn't clicked the button "Perform experiment". 2) The Oscilloscope is not in the run mode. 3) The channels are not switched on (channels are switched on from the buttons 1 and 2 in the interface of the oscilloscope)

4. **I am configuring the function generator and it doesn't let me insert 20Vpp or offset of 5V.**

The maximum amplitude of the generator is 10Vpp. The offset is related to the signal's amplitude, thus it is not possible to introduce any signal beyond this value.

5. **I want adjust the power supply to 12V but it doesn't bypass 6V.**

Make sure you pressed the button +25V. If not, as maximum you only can introduce 6V.