

Remote labs with Arduino – Quick User Guide

(steps 1–5 for a new Arduino board and PC without software Arduino IDE)

1. Install **Arduino IDE** from www.arduino.cc – Software-Download-Windows installer.
Now Arduino-Uno board is **not connected**. *It might require running as admin (right mouse button menu).*
2. **Download the software** (usually a **zip** file) for Remote lab from the main page www.ises.info
(e.g. [VirtualLab Capacitor Charging and Discharging](#))
3. **Unpack** the zip file (including all subdirectories) e.g. to C:// or to the desktop (or anywhere ...*...).
4. Copy our **Remduino** folder situated in “...*.../VirtualLab_arduino_exp_spec/Arduino_firmware/libraries”
to the **default Arduino IDE** folder, e. g. “This computer/Documents/**Arduino/libraries/**”
5. Open **Arduino_demo.ino** in the **Arduino IDE** environment (see the first step)
(* .ino file is situated in “...*.../VirtualLab_arduino_exp_spec/Arduino_firmware/Arduino_demo/”),
connect the Arduino board via USB to the PC and specify the COM port number
(to find it out press [Win]+[X], open **Device Manager**, select “**Ports (COM and LPT)**”),
finally **upload** the *.ino file to your Arduino board by the [→] button.
6. **Run the MeasureServerLite** (situated in ...*.../VirtualLab_arduino_exp_spec/bin/),
select, i.e. click on the **Arduino** folder and press the [Configure Selected] button bellow,
specify the COM port number and press [OK].
Please **check** that there should be only ONE running MeasureServerLite application on the **task bar**,
otherwise open the second one (COM port opening error message) and press OK.
7. **Run the ImageServer2.exe** (situated in the **bin/** folder), select your webcam and press [Start Capture]
button (*OPTIONAL*).
8. **Run the web server Nginx.exe** (situated in ...*.../VirtualLab_arduino_exp_spec/pages/Nginx/).
Keep this folder open to *stop the web server* running on the *background* by the “**Stop.bat**” batch file.
9. **Try out and enjoy** the experiment (running as a server at the same PC) → **Open web browser** and type
127.0.0.1 , or **localhost** into the URL address line. *For the next step find out the IP of this server PC:*
Press [Win]+[X], click on **Run**, type **cmd** [Enter], type **ipconfig /all** [Enter], search for the IP address.
10. Enjoy the **control from another PC / smartphone**. Open any web browser and type the IP address (step 9).

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(steps 6–10 for ready server PCs and Arduino boards)

6. **Run the MeasureServerLite** (situated in ...*.../VirtualLab_arduino_exp_spec/ **bin** /), click on the **Arduino** folder and press the [**Configure Selected**] button, specify the COM port number and press [OK].
Please **check** that there should be only ONE running MeasureServerLite application on the **task bar**, otherwise open the other (*COM port opening error message*) and press OK.
7. **Run the ImageServer2.exe** (situated in the **bin/** folder), select your webcam and press [**Start Capture**] button (*OPTIONAL*).
8. **Run the web server Nginx.exe** (...*.../VirtualLab_arduino_exp_spec/ **pages / Nginx /**).
Keep this folder open to *stop the web server* by the “**Stop.bat**” batch file.
9. **Try out and enjoy** the experiment (running as a server at the same PC)
→ **Open web browser** and type **127.0.0.1** , or **localhost** into the URL address line. *For the next step find out the IP address of this server PC:*
Press [**Win**]+[**X**], click on **Run**, type **cmd** [Enter], type **ipconfig /all** [Enter], search for the IP address.
10. Enjoy the **control from another PC / smartphone**.
→ Open any web browser and type the IP address (step 9).