

## **TEKLAB electrical working station**

### **Before you start working:**

- Ask the staff to open the table and any accessories you need
- Start TUTLab's air suction system (ask from the staff if you don't know if it is on or not)
- Start the table's own air suction

### **General user instructions:**

1. Both stations are identical and have following equipment:

- Weller soldering station
- TEKLAB laboratory power supply, max 35V 5A (2 pcs)
- Fluke multimeter
- Tektronix 200MHz digital oscilloscope
- Rohde & Schwarz 10 MHz function generator

2. Accessories, such as soldering iron handle and oscilloscope probes are in storage, ask them from the staff.

3. Power up the desk by turning the power switch clockwise. The switch is located in the right side and has three positions. To power, turn the switch to third position and then let it turn back to second position. If the power does not turn on, check the emergency stop next to the power switch.

4. If you use solder or components, mark your usage (quantity and price) to a material slip.

5. When you have finished

- return all accessories and unused components to correct places
- show/pay the materials you have used to the staff
- If no one is coming to use the electronic table after you turn off the power from the table and the table's own air suction
- clean up the desk!

**Quick Start guides for equipment:****Weller soldering station:**

1. Attach the handle to its place (lower left corner) by inserting the connector and turning the lockwheel clockwise. NEVER use any tools to tighten up the lockwheel.



2. Keep the handle in its holder and turn on the soldering station. The display on the desk part should light up. If not, check that the desk is powered.

3. Soldering iron is ready to use in seconds, meanwhile you should check that the sponge is wet. If the sponge is dry, remove it from the holder and moisten it with tap water. The sponge should be wet but not dripping.

4. To use the soldering iron, hold the handle from its plastic part. The tip heats up to around 360°C, do not touch it. You should never use soldering iron to melt plastic or anything but the solder. Using wrong materials or using too high temperatures (360 is usually enough) will damage the tip.

5. If you want to remove old solder, using flux makes the process easier. Tutlab has flux pens. Apply the flux as if gently coloring the old, cold tin.



Never use flux pen directly to the tip of the soldering iron or heated up soldering tin. After applying flux, you also should apply some new solder to the tip to increase the heat transition between the tip and the old soldering tin.

**6.** On new connections, you should use holding accessories to keep your wires and/or pcb in place. You can get these accessories from staff.

**a.** When soldering 2 wires to each other, strip both ends and apply solder to them.

Then move the stripped ends next to each other and reheat the solder. Have the actual wires touch, not just the soldering tin. Allow the solder to cool for 5-10 seconds before moving the new connection.

**b.** If you want more sturdy connection between 2 wires, you can twist the stripped ends together before applying any solder.

**c.** When soldering small components to a pcb, use tweezers. You also need a lot less soldering tin and try and solder the components quickly. Too much heating can break the components.

### TEKLAB power supplies (2 pcs):



**1.** Turn on the power supply with the green switch. Wait for a moment to let the device turn on.

**2.** Set voltage (Uset) and current limit (Ilim) are on the right side of the screen. They can be set using the knobs next to the screen. Step size is displayed under the value and can be toggled by pressing the knob. Steps are 1.0V and 0.1V for voltage and 0.1A and 0.01A for current.

**3.** Display-button opens the settings. In regular use, you do not need these.

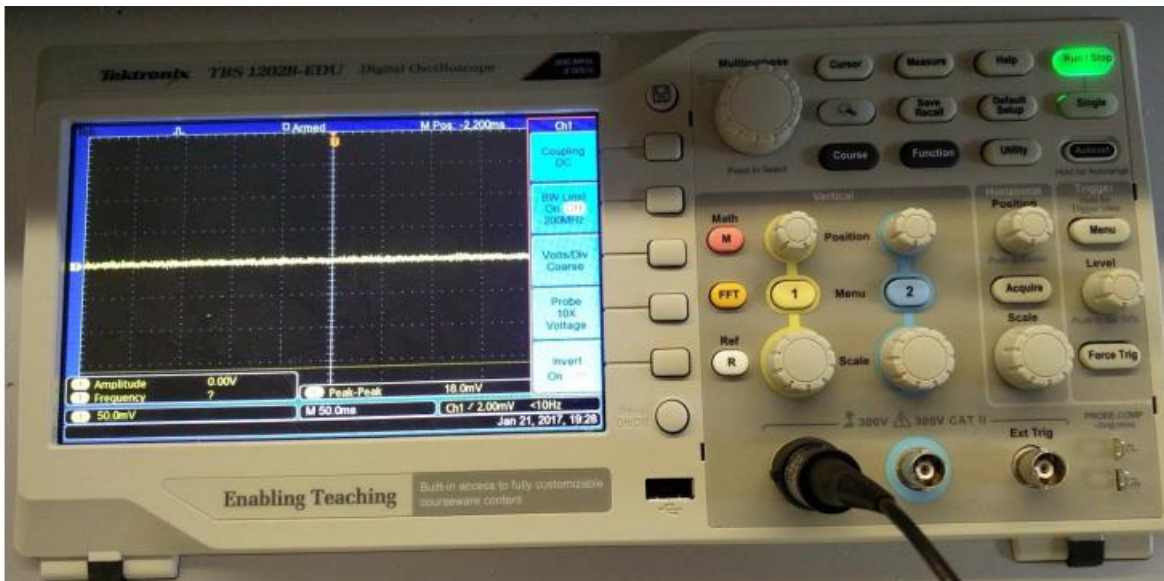
**4.** Make all connections before turning the output on. Use banana plugs with the sockets on the power supplies. Never shove stripped wires to the sockets. You can toggle the output on and off using the Output-button.

**Fluke multimeter:**

1. Attach the multimeter probes to black and red sockets. To use the multimeter for current measuring, attach the red probe to a socket with suitable fuse (400mA or 10A).
2. Turn the knob to turn the multimeter on and to choose a function. To use the functions marked with yellow font, press the yellow button.
3. By pressing Hold-button multiple times, you can choose between automatic and manual range and automatic and manual hold. Hold-option allows you to keep the measure on screen after measurement (really useful if you can't see the screen while measuring).



## Tektronix Oscilloscope



1. Turn the oscilloscope on with the green switch.
2. Attach probe or probes to color coded sockets (Channels 1 and 2).
3. Choose the channel with the color-coded buttons marked 1 and 2. They are in darker colored area marked Vertical, above the sockets.
4. Check the multiplier of the probe from the connector and select a correct one by pressing the channel button and then fourth button down next to the screen. You can use the multipurpose wheel to select a value.
5. Settings for X-axis are in darker area marked Horizontal.



## Rohde & Schwarz Function generator

1. Attach the wires to Trig. Outp. (Trigger output) or 50 Ohm output -socket.

a. Trigger output is a square wave with signal between 0...5V.

b. To use any other amplitude and/or offset, use the 50 ohm output.

2. You can select the wanted signal type

with Function-button. To change the output frequency, use the frequency-knob to change the value and the two buttons below it to change the order of magnitude (Move the decimal point). Offset and amplitude –buttons are located next to the screen.

3. To use sweep-utility, press the Sweep button once and give your starting frequency. Second press and stop frequency. Third press and sweep time in seconds. Sweep utility is active in any of these settings, in other words, while any of the sweep-utility lights are on.

