DIY Guide

1. Safety warning

The kits are main powered and use potentially lethal voltages. Under no circumstance should someone undertake the realisation of a kit unless he has full knowledge about safely handling main powered devices. Always work on a clean and tidy area.

Always pull off the mains plug before working. Turning off a switch is not enough.

2. What skills are needed ?

Meticulous care is the first skill you will need to build one of those kits. One single component that is not in the right place , in the right direction, one single solder joint that is deficient and the whole thing won't work ! So the secret to success is simple : follow the assembly guide down to the letter and triple check all your moves.

Good soldering practice is also needed. Your boards will be as weak as your weakest solder joint. So this is very important. But easy to learn. If you have no soldering experience, start practising with a piece of Veroboard and a handful of resistors. You should be perfectly operational after a few hours.

Basic electrical and electronic understanding. Do you know what is a Volt, an Ohm, an Ampere ? Can you use a digital multimeter ? If not, find a friend that does or buy an assembled kit.

3. What tools do you need ?

Necessary tools

A good soldering iron, preferably thermally regulated, 15-30W if not regulated, with a medium size tip (1.5-2.5mm wide), screwdriver shape. And a bobbin of good quality solder, 0.8 to1mm diameter.

Solder. Only use first grade solder, 0.8 to 1mm diameter. Good quality solder will make the soldering process easier and you will get nice shiny joints.

Cutters. If you plan to go ahead with DIY, buy good quality cutters.

Flat nose pliers

Phillips screwdriver, Slot screwdriver (3mm), Insulated screwdriver for trimmers, Nut driver ø5.5mm, Socket spanner ø10mm, 12mm, 14mm (and ø7mm for MP12, MP66 and MP73)

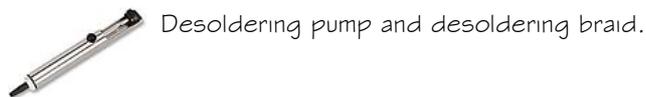Digital multimeter with thin, insulated test hooks

Component wires bender. Allows precise bending of the leads of resistors and other components.

Good to have tools

Desoldering pump and desoldering braid.

Wire strippers

Tweezers

Hot air gun for shrinking heat shrink tubing. It is needed for the power supply cable in the DIO2 kit and in the power supply PSL1 and PSL2 kits.

Deluxe tools

Oscilloscope

Signal generator

4.   Components assembly

4.1. Component direction :

Many electronic components have a polarity. Installing them the wrong way round will prevent the board working and in many cases will destroy them. So be extremely careful.

Other components like resistors, film capacitors and inductors don't have a polarity. But it is a good practice to install them in such a way that the marking can be read from left to right or from top to bottom, in the same direction as the reference marking on the PCB. This will make your boards look more professional. The only exception is for film capacitors, if the marking is hidden by a close adjacent component, turn it the other way round.

4.2. Soldering :

Work in a well ventilated area.

Work on a flat piece of dense foam, larger than the board. After inserting the component turn the board over and press it against the foam to maintain the component in position during soldering.

Make sure the parts are perfectly clean, free from grease or oxidation. If they are not, start by cleaning them with a solvent for grease or a fine emery cloth for oxidation.

The iron tip must always be clean and shiny. Wet it with fresh solder and wipe it on a damp sponge frequently. When ready, press the iron tip against both the pad and the component lead to warm them up then add just enough solder to fill up the hole and create a little cone between the pad and the lead. The whole process should last no more than 2 or 3 seconds. The joint should be small, smooth and shiny. Cut the leads flush to the joint.

After the board has been stuffed, brush it with a hard tooth brush to remove any remaining solder bits.

4.3. Long leaded components

For components like resistors, diodes, inductors, bend the leads at the correct distance using a wire bender tool. Insert into the PCB holes. Turn over the PCB and slightly bend the leads apart, just enough to maintain the component in place. Press the PCB against the foam while you solder the leads. Cut the leads flush.