Command box wiring 1

Connectors Sub-D 9 pins have been chosen, either for command and for power, because they are easy to find and of low cost. Also, the maximum current is relatively high for small connectors.
Depending it's quality, each pin (male or female) of a Sub-D connector can drive from 1A to 7.5A, so choose carefully your connectors.

With the pinout chosen for the bipolar boards, there are two pins per wire.

With the pinout chosen for unipolar boards, there is only one pin per wire, so the current is more limited.

Pinout of unipolar motors (6 wires) is not compatible between a bipolar board and a unipolar board, it have been decided to have female connector on the panel for bipolar power board, and male connector on panel for unipolar power board.

It exists two manners to wire unipolar steppers (6 wires) to bipolar boards (4 wires). The mode called 'Half-winding' have been chosen because, even if it does have slightly lower torque, it's behaviour at speed is much better.
You can, at your will, use the other mode, but if it is for an '□tocoup' machine, i don't recommand it, because that machine needs fast turning steppers.

Z selection switch (optional) is used to command a rotating divider instead of Z linear axis, without having to replug the divider stepper on Z plug.
It's only action is to swap board output to one connector or to the other.

In order to have a standard panel for CNC router and hot wiring cutting machines, pushbuttons 'temperature +' and 'temperature -', and also connectors for the wire and it's supply have been added.

Evidently, you don't need to install the unnecessary connectors.

Currents being relatively low (< 5A), small cables with high current density can be used. We can use, or even exceed 10A/mm2. Heating, on small cables, will be very low and line resistance, while not negligible, will have marginal effect on performances, especially if your board control current.

For bipolar motors 2 x 2A, which are those used on my machine, i recommend the use of cables 4 x 0.22 mm2, shielded. Shielding is required when using chopper boards (based upon PWM).
While cables are very long on □tocoup machine (6 m for the longest), these cables are largely sufficient.
Before using these cables, i have used successfully flat cable with a lower sectional area. Though, i've abandoned them because of lack of shielding.

For external command signals and limit switches, you can use smaller cables than for steppers, but shielded cables are recommended due to the length of the cables. Section area of 0.12 mm2 by wire is sufficient.

PR
ZR