
Tutorial 5 – MicroStepper Setup

Introduction

The micro-stepper is a replacement for the Prior electro-mechanical stage, brought up-to-date and with significantly improved accuracy. It is fully automated, moving a slide in both horizontal and vertical directions under software control. The control software is both embedded in **PETROG** and available as a separate, stand-alone application, **PETROG-lite**.

A micro-stepper consists of:

- a power lead and transformer for connection to mains power and converting this to 12V DC;

- the stepper assembly, which fits onto the stage of the microscope, is located with two pins and retained with one screw, and includes two permanently attached trailing leads;

- a control box, with sockets at one end for the lead from the stepper assembly and at the other for connection to mains power and connection to the computer;

- a null-modem cable to connect the control box to the computer's comms (RS232 communications) port; and

- a box, which must be used to transport the device (this is a precision instrument designed to work to an accuracy of a few microns and should always be handled with extreme care).

Components

Connecting to Mains Power

The control box is designed to accept 12V DC power. The Micro-stepper is supplied with an adapter and plug for the locale. If you need to connect the unit to a different power supply, you should be able to purchase a replacement power adapter and plug, or just a plug adapter, at a local electrical retailer or computer dealer.

The Stepper Assembly

The stepper assembly fits onto the stage of the microscope where it is located with two pins and retained with one screw. The unit should function quite well without being screwed down – it should not need to be retained tightly. Do not over tighten the screw.

There are two leads trailing from the unit, one from each of the x- and y- sliders. Position these carefully so that they cannot tangle or snag and hence restrict the movement of either slider.

WARNING : The motors in the sliders are very powerful and, if the leads snag, it is possible for the motors to pull the sliders from their mountings. In such an event the unit must be returned to the manufacturer for maintenance.

The Control Box

At one end the control box has an on/off switch and socket marked “PC”. At the other end there are sockets for the cables from the stepper unit and a socket designed to accept DC power.

On one end of the control box is an on/off switch; on the other is a green light which is illuminated when the control box is receiving power. There is therefore a visual confirmation at each end that the unit is switched on.

WARNING: When the unit is switched on, the motors will each return to their “home” or zero position, touching the respective microswitches. This ensures that the unit starts from a known position (it cannot be queried for its position). If you are not aware that this is going to happen, you may not have cleared the path through which the unit will travel. Before turning on the power, please ensure that it will not touch the objectives and that there is nothing to hinder its movement.

The Null Modem Cable

The control box is connected to the computer using a standard RS232 null-modem cable (specification: wires 2 and 3 crossed, 5 connected). If this cable is lost it can be replaced at most computer dealers.

Setting up the MicroStepper

PETROG provides tools for setting up the MicroStepper for each of its functions. For [Quantitative point-counting](#):

Select the Main menu ⇒ Sample ⇒ Data entry Methodology ⇒ Quantitative .

The Area of Interest set for quantitative compositional analysis (point counting) will also determine the positioning for estimation analysis; in the former case, the unit will start at the (Bottom, Left) position and traverse the slide in a Z pattern to the (Top, Right); in the second case the unit will position itself at the centre of the Area of Interest, but may be moved manually.

Stepper-Troubleshooting

If the stepper does not respond, or if the main window displays the message:

No stepper attached

First check that there is power to the stepper: the green light should be showing. If the stepper is receiving power but PETROG does not recognise it, use the menu

Tools ➡ Stepper

to check that it is under software control. If re-initialising it does not correct the problem, check each of the following in turn:

Is there power to the stepper control unit? The green light should be illuminated. If it is not, then check the power supply to the control box.

Is the stepper correctly connected to the computer? The cable supplied is an RS232 (null modem) cable. If the cable needs to be replaced, a standard null-modem cable

may be used. The connection into the control unit is labelled "PC"; at the computer, the cable should be connected into a serial (COM) port, preferably the first available.

Is the port correctly identified?

Menu option

Tools | Stepper | .Configure

takes you to a dialog captioned

"PETROG lite: configure stepper"

on which there is a drop-down box listing the ports available on your machine.

Hopefully, choosing one of these will find the stepper on the end of the port.

Failing that, you can check in your computer system set-up:

Control Panel | System | Hardware | Device Manager | Ports (COM & LPT)

(Hardware is a tabbed page option, Device Manager a button)

make a note of which COM ports are available, then set each in turn manually, using the registry. To do this, look in the registry under:

RootKey HKEY_CURRENT_USER

\Software\PetrogShared

Port_Number

and change it with the RegEdit editor.

Sometimes, computers are set up having more than one port with the same name. This causes problems for the operating system to identify the port. In that case, the stepper will not work until one of the duplicately named ports is re-named.

If none of these actions works, then there is probably a hardware fault. The most likely hardware fault is no power to the stepper