

## **TUTORIAL N° 3**

### **MICROMANAGER TUTORIAL**



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## A. Getting Started

This guide will take you through the steps of setting up Micro-Manager (<http://micro-manager.org/>) to use your PIEZOCONCEPT device. This guide will not cover everything Micro-Manager has to offer, but will show everything that can be used with a PIEZOCONCEPT nanopositioner. For more information on how to use Micro-Manager, check out the Micro-Manager user guide at: [https://www.micro-manager.org/wiki/Micro-Manager\\_User%27s\\_Guide](https://www.micro-manager.org/wiki/Micro-Manager_User%27s_Guide)

### 1. Downloading Micro-Manager

Micro-Manager can be downloaded from the Micro-Manager downloads website [https://www.micro-manager.org/wiki/Download%20Micro-Manager\\_Latest%20Release](https://www.micro-manager.org/wiki/Download%20Micro-Manager_Latest%20Release).

This guide was written to work with Micro-Manager version 1.4.

### 2. Using the PIEZOCONCEPT DLL

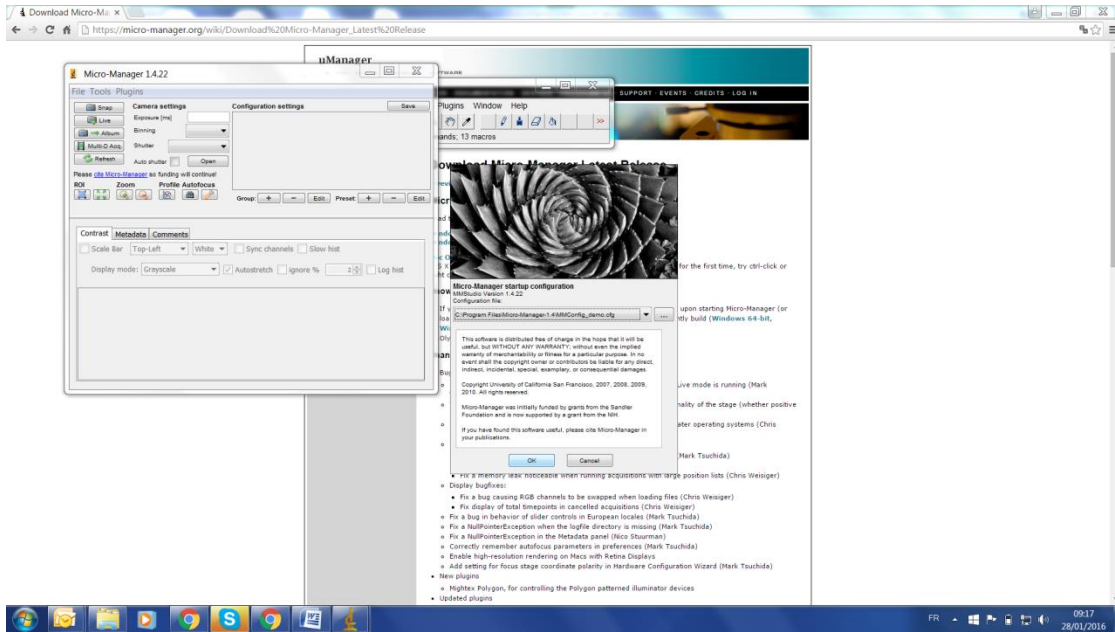
Depending on the Operating Software (32bits and 64 bits), the corresponding PIEZOCONCEPT DLL must be copied into the Micro-Manager root directory (i.e. C:\Program Files\Micro-Manager-1.4). Once the DLL is placed in the root directory, it will be able to be loaded by Micro-Manager.

\* Note that a DLL must have the prefix “mmgr\_dal\_” in order to load correctly with Micro-Manager.

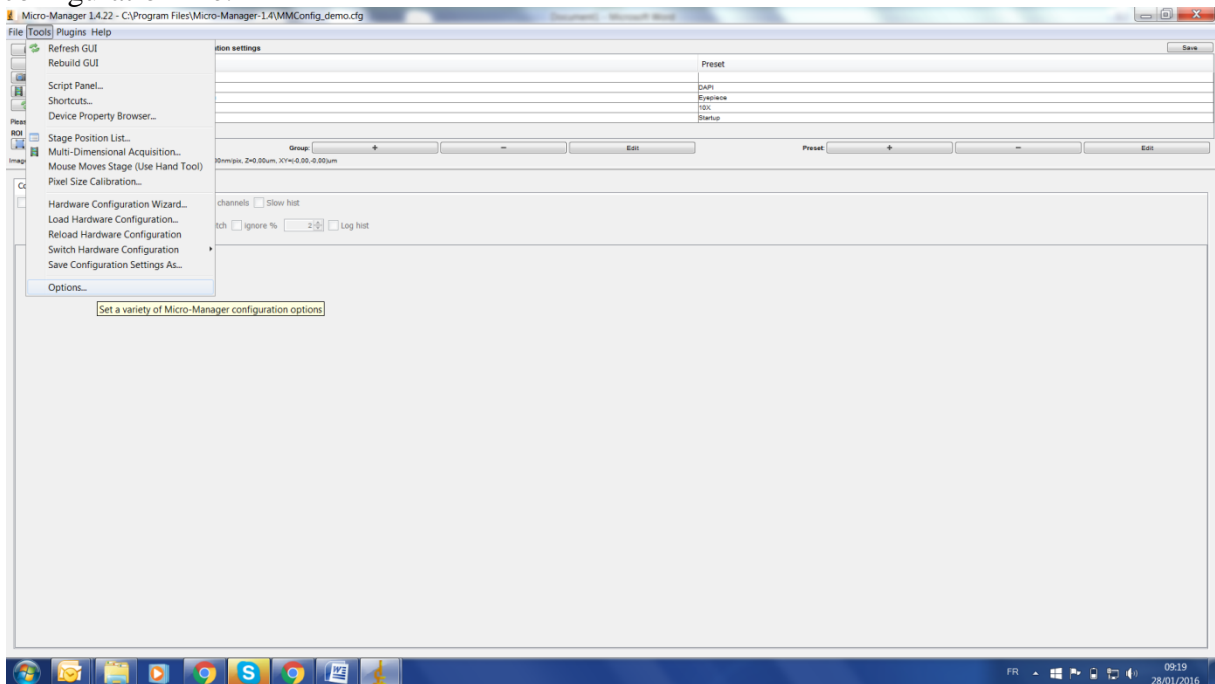
### 3. Running Micro-Manager

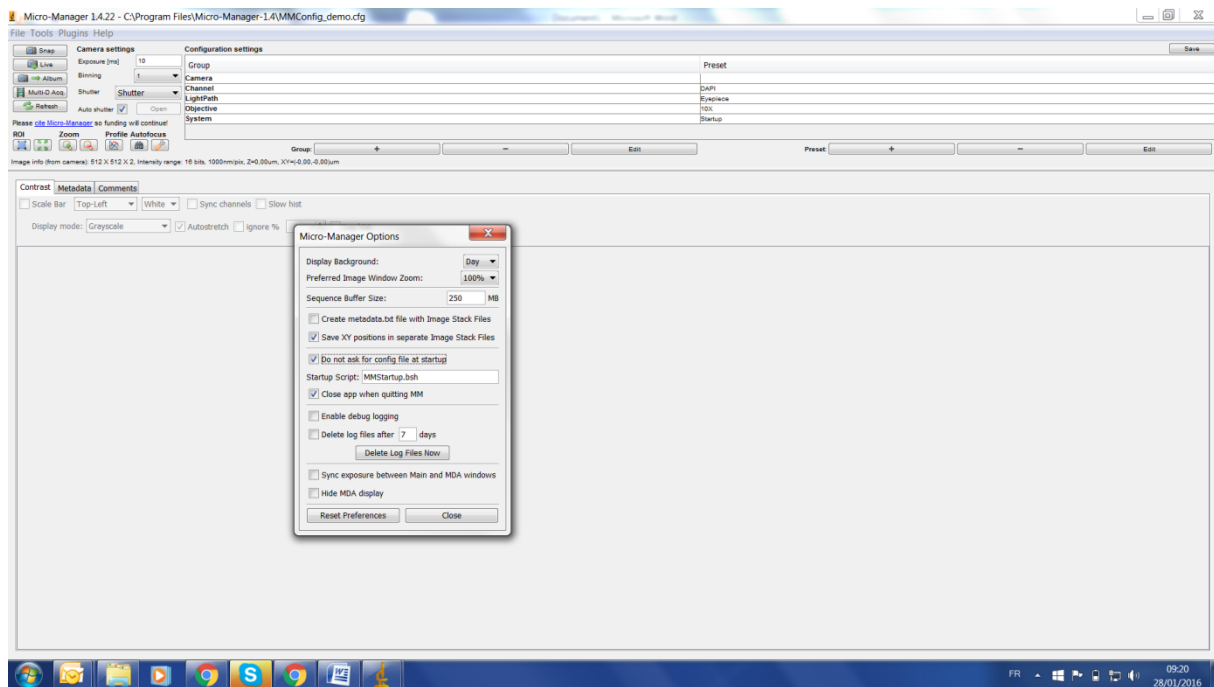
When you run Micro-Manager, two screens pop up. One is the ImageJ program and the other is the Micro-Manager plugin.

Micro-Manager loads the Micro-Manager Startup screen after being run. From here, a configuration file can be loaded. The most recently used configuration file will be shown (or the demo configuration file if Micro-Manager is being run the first time). Clicking “OK” will take you to the Micro-Manager main screen.



The Micro-Manager Startup window can be shut off in the Options window (choose Tools->Options from the main menu). In the Options window, check “Do not ask for config file.” If this box is checked, Micro-Manager will automatically load the most recently used configuration file.

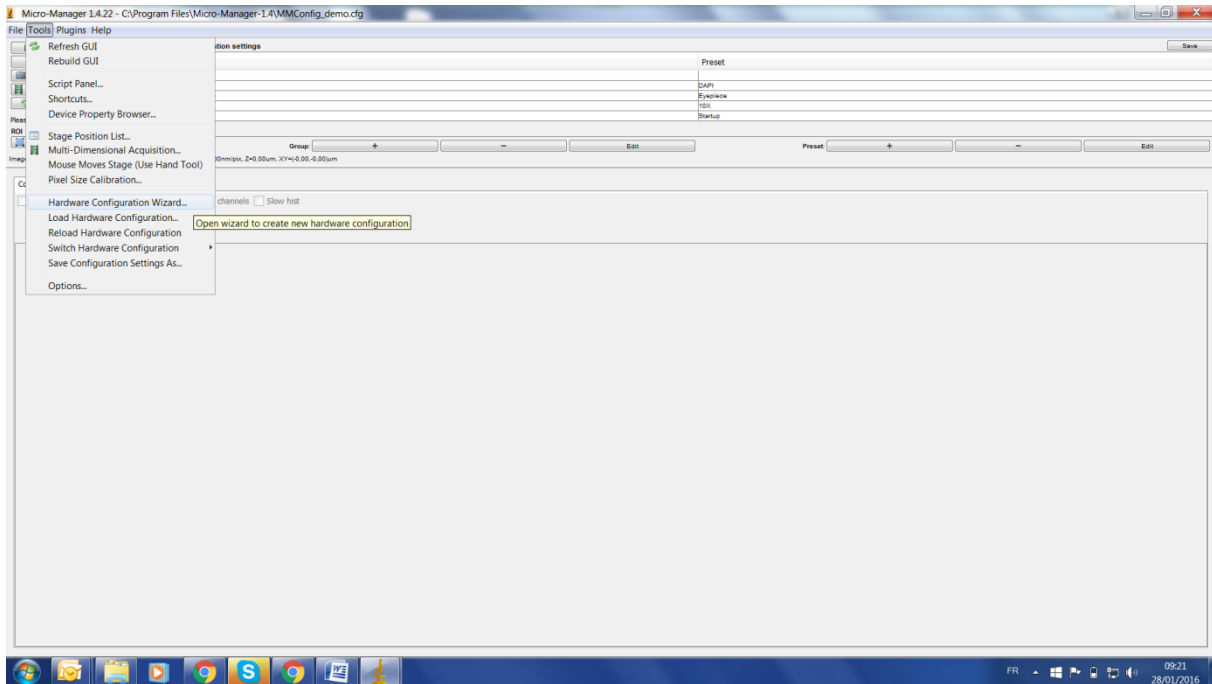




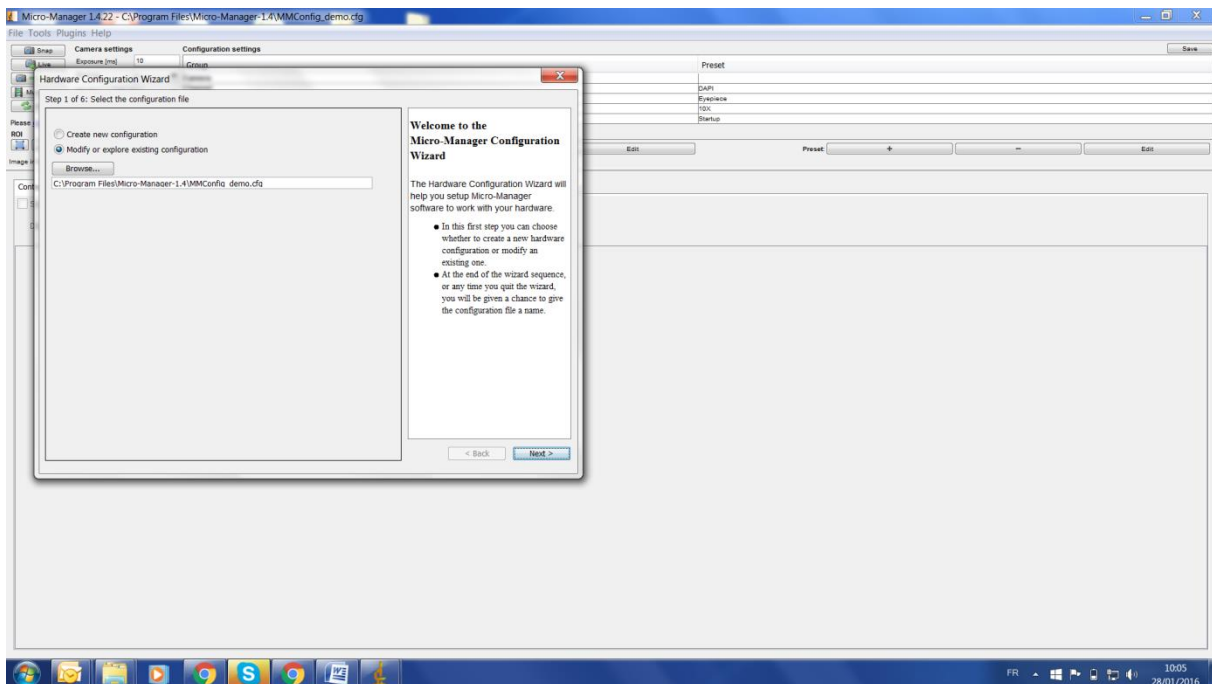
## B. Hardware Configuration Wizard

In order to get your PIEZOCONCEPT device working with Micro-Manager, Micro-Manager needs to be properly set up. The two options are to go through the **Hardware Configuration Wizard** or to load a **Configuration File**. Both will be able to successfully load your PIEZOCONCEPT Device.

The Hardware Configuration Wizard allows you to manually load devices through Micro-Manager. The Hardware Configuration Wizard takes you through nine steps. This tutorial will highlight the steps that will involve a PIEZOCONCEPT device. If you are new to Micro-Manager, it is recommended that you setup your device through the Hardware Configuration Wizard since it is an easy way to make sure your device will be correctly setup in Micro-Manager. To access it, choose Tools->Hardware Configuration Wizard from the main menu.

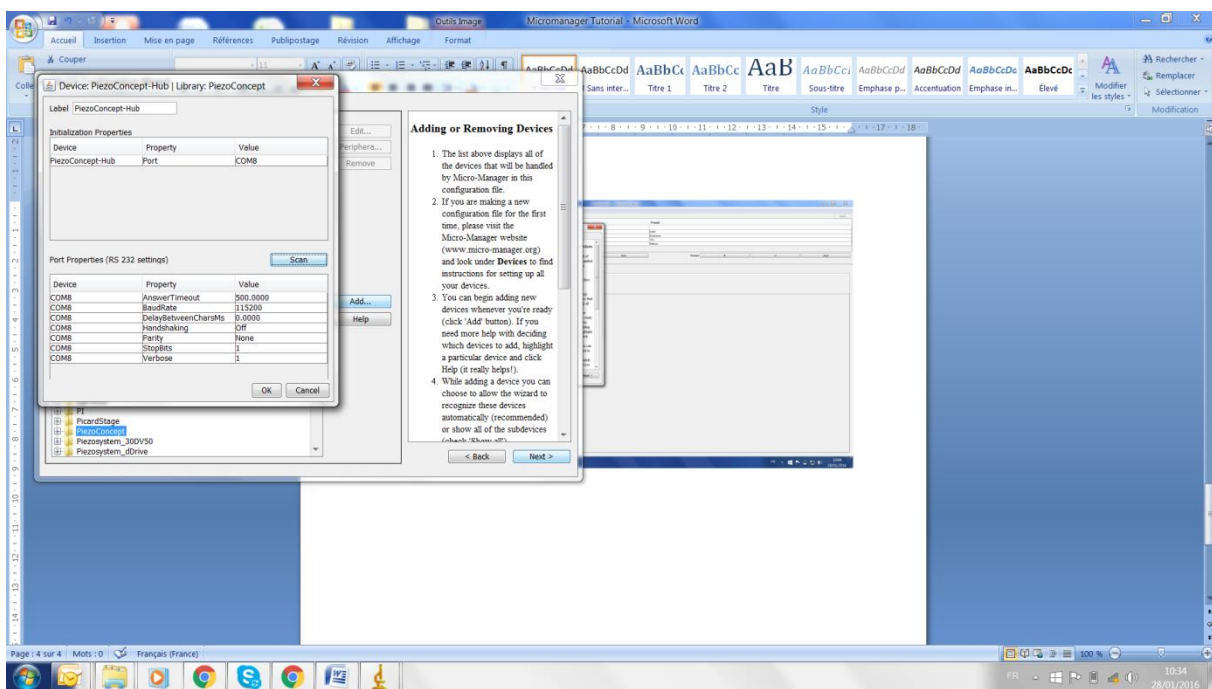
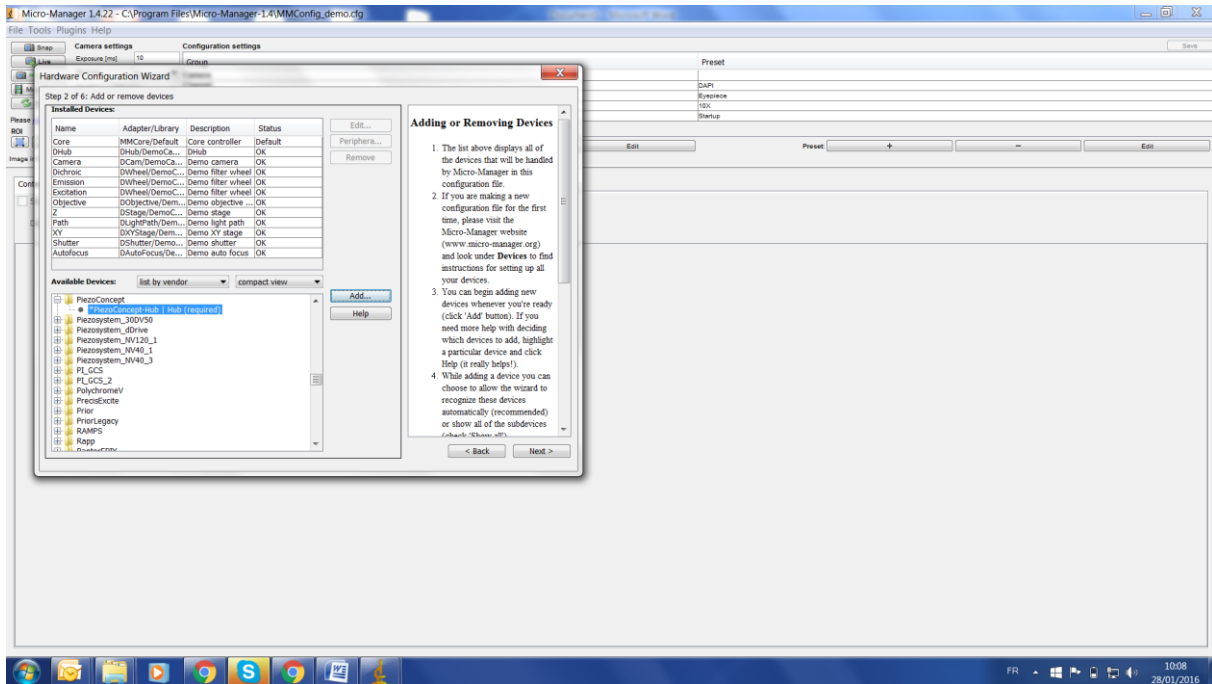


*Step 1: Select the configuration file*



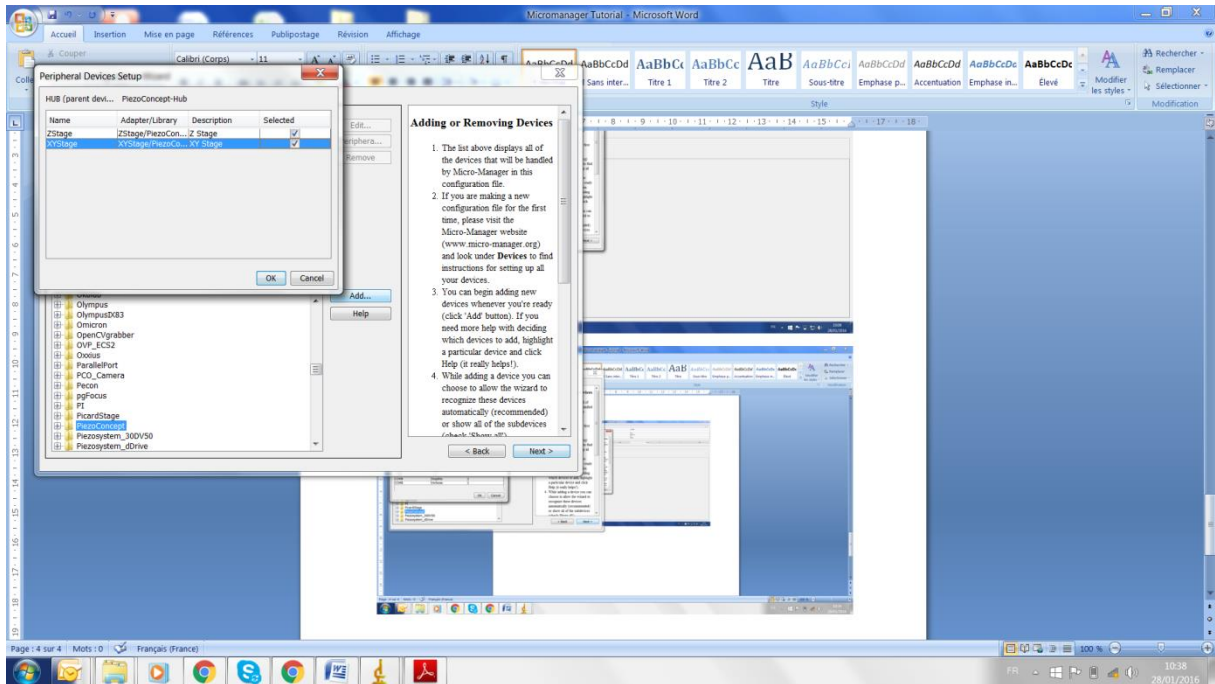
If you already use other devices with Micro-Manager and have a configuration file, choose “Modify or explore existing configuration” and load the configuration file you wish to use. Otherwise, choose “Create new configuration.”

*Step 2: Add or remove devices*

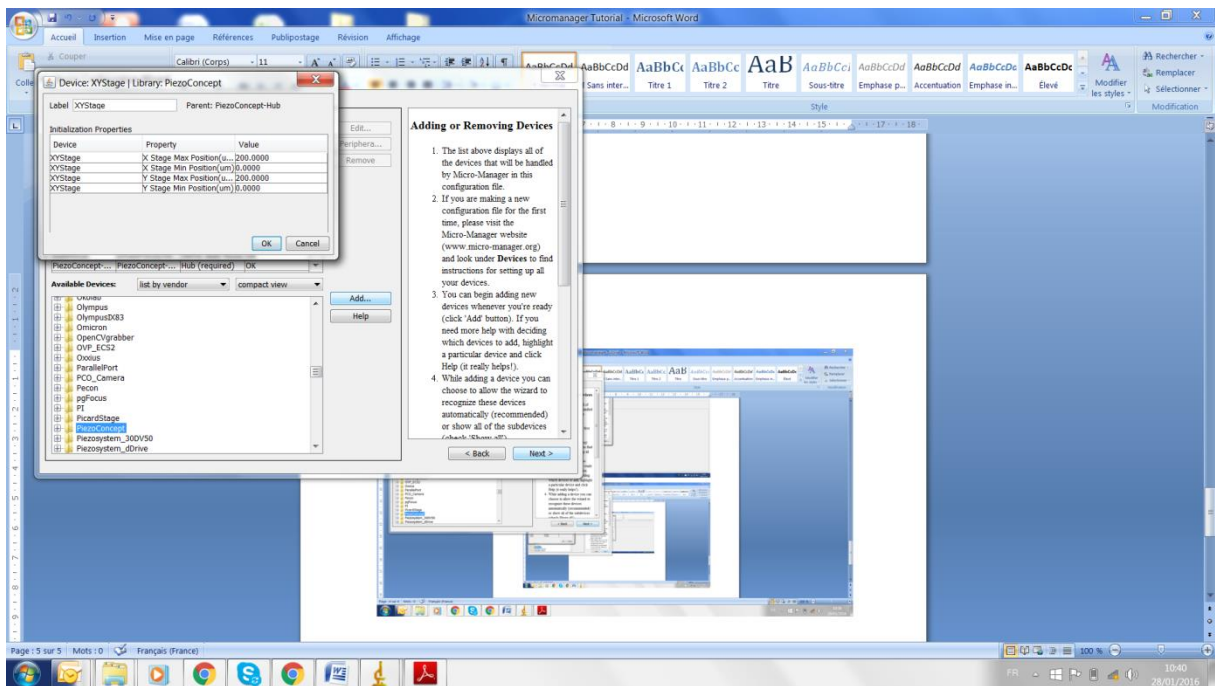


This window will show which devices Micro-Manager is already connected to. If you are creating a new configuration file, the only device that will appear is Core, which cannot be removed. Click on the “Add” button to open the “Add device” window. From here, scroll down to the PIEZOCONCEPT device you wish to connect to Micro-Manager. When you press “Add,” it will prompt for a device name. This name is arbitrary. It allows Micro-Manager to keep track of multiple devices of the same type.

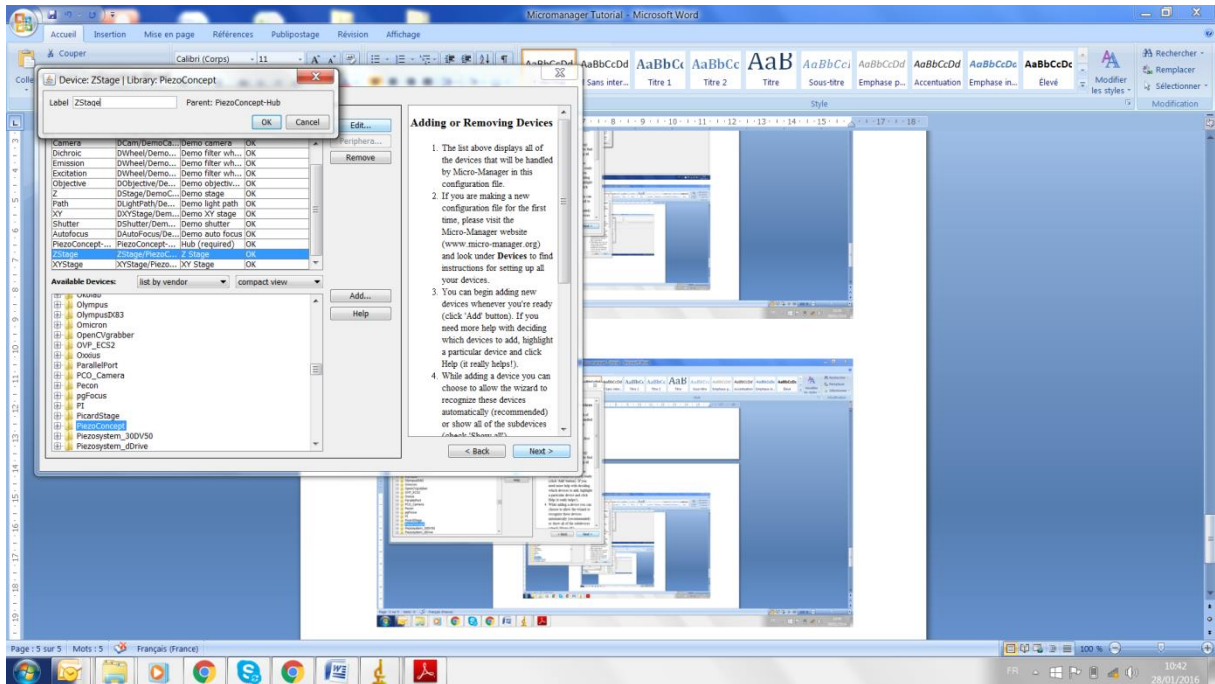
Please pay attention to enter the correct Baud rate (115200).



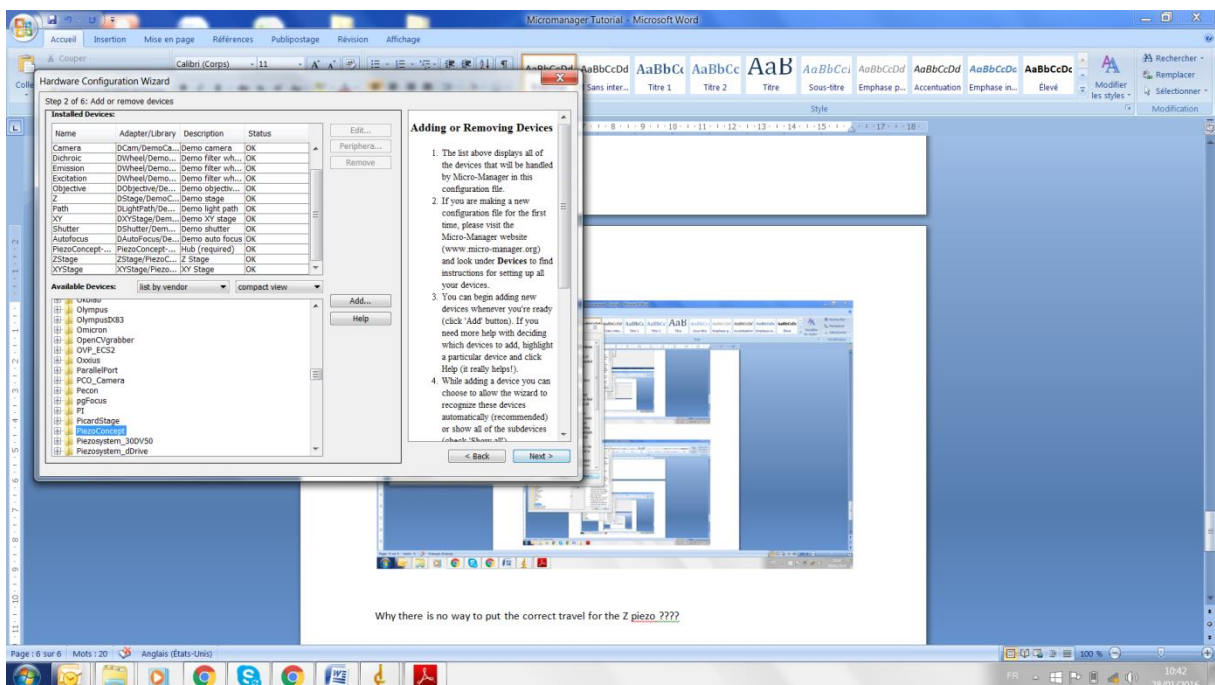
You can precise the correct travel range of your XY stage here.





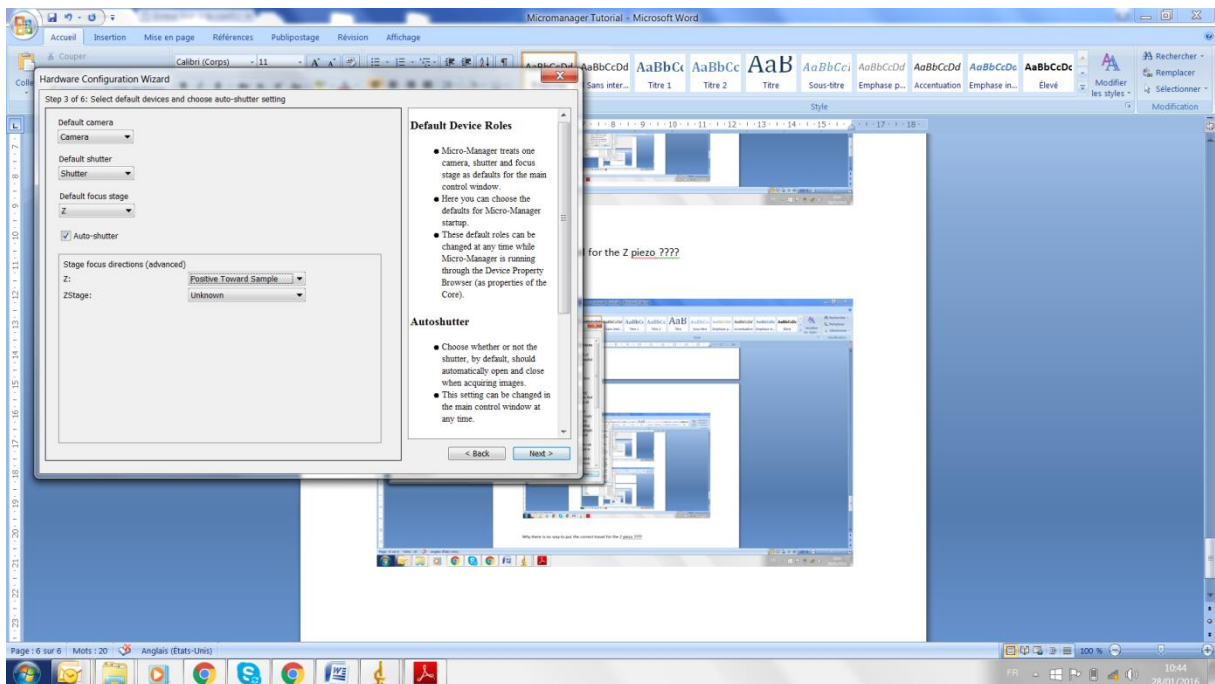


After adding all of the wanted devices. Click “Done.” This will take you back to the “Add or remove devices” window.



This window will show all of the devices that have been added to Micro-Manager. Any unwanted devices can be taken away by pressing the “Remove” button.

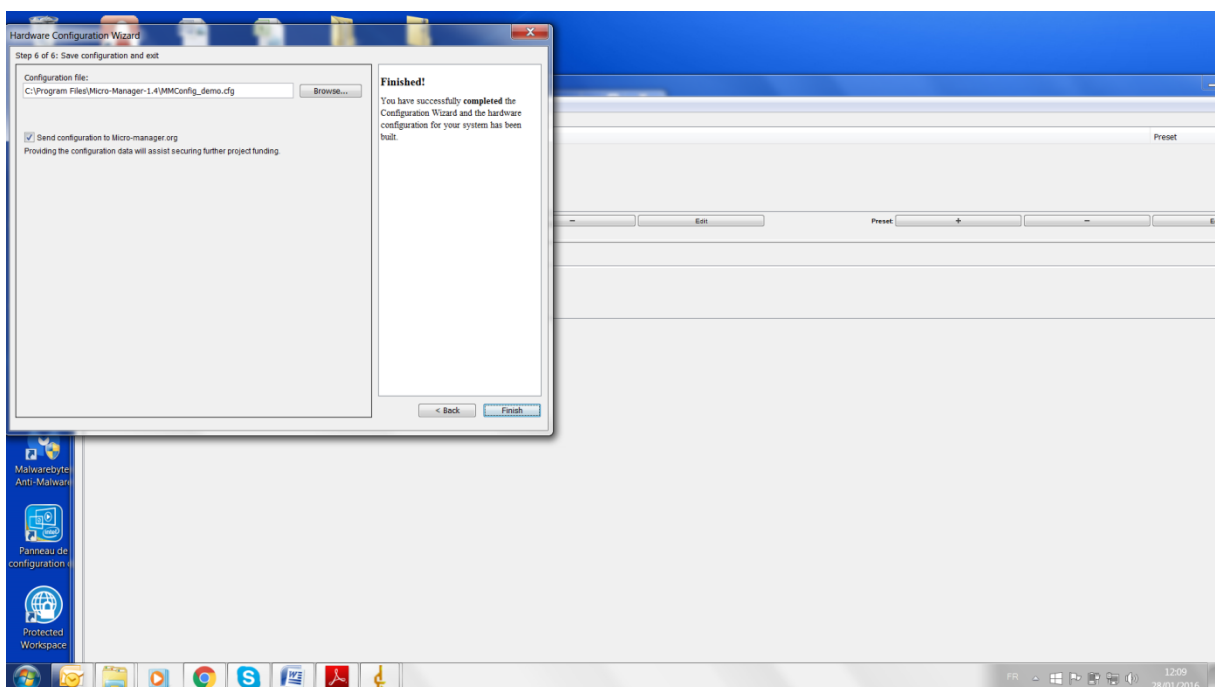
*Step 3: Set default devices and choose auto-focus setting*



If your PIEZOCONCEPT device has a Z axis, you need to tell Micro-Manager that you want it to be the default focusing device. Choose the device from the “Default focus stage” drop down menu.

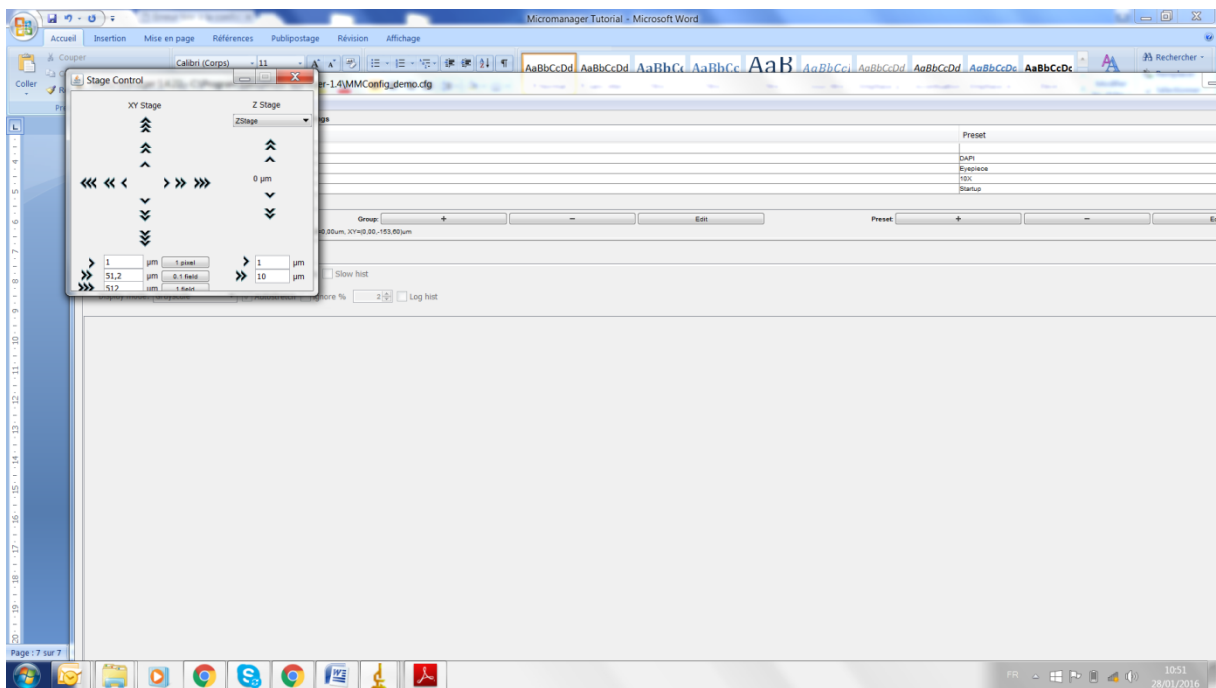
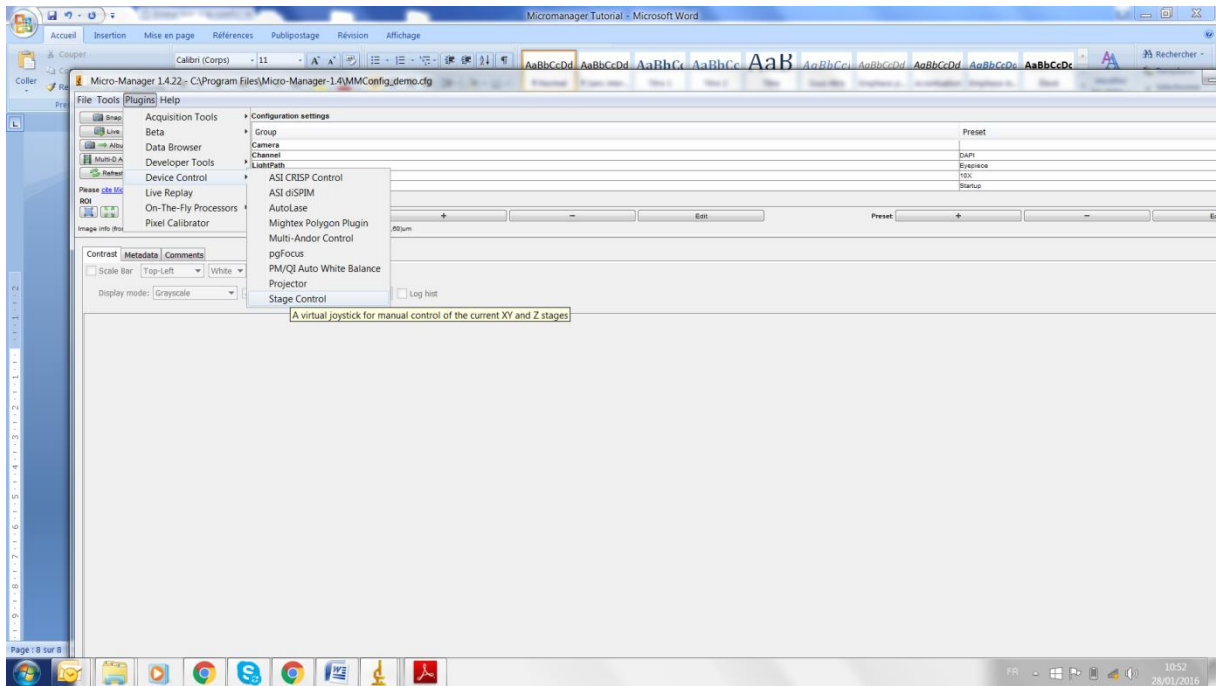
Step 4 and 5 are voluntarily omitted here (they are not related to the PIEZOCONCEPT stage)

*Step6: Test configuration, save, and exit*



## C. Stage Control Plugin

The position of your PIEZOCONCEPT device can be controlled by the “Stage Control” plugin. Choose the Z stage from the “Z stage” drop down menu.



You can change the field value to 200 $\mu$ m.

