

Interfacing a nanoAcquity with a Thermo Mass Spec

Overview

This document is intended to help you connect a nanoAcquity to a Thermo mass spectrometer. If you get lucky you may have nice service engineers from both companies that can help you.

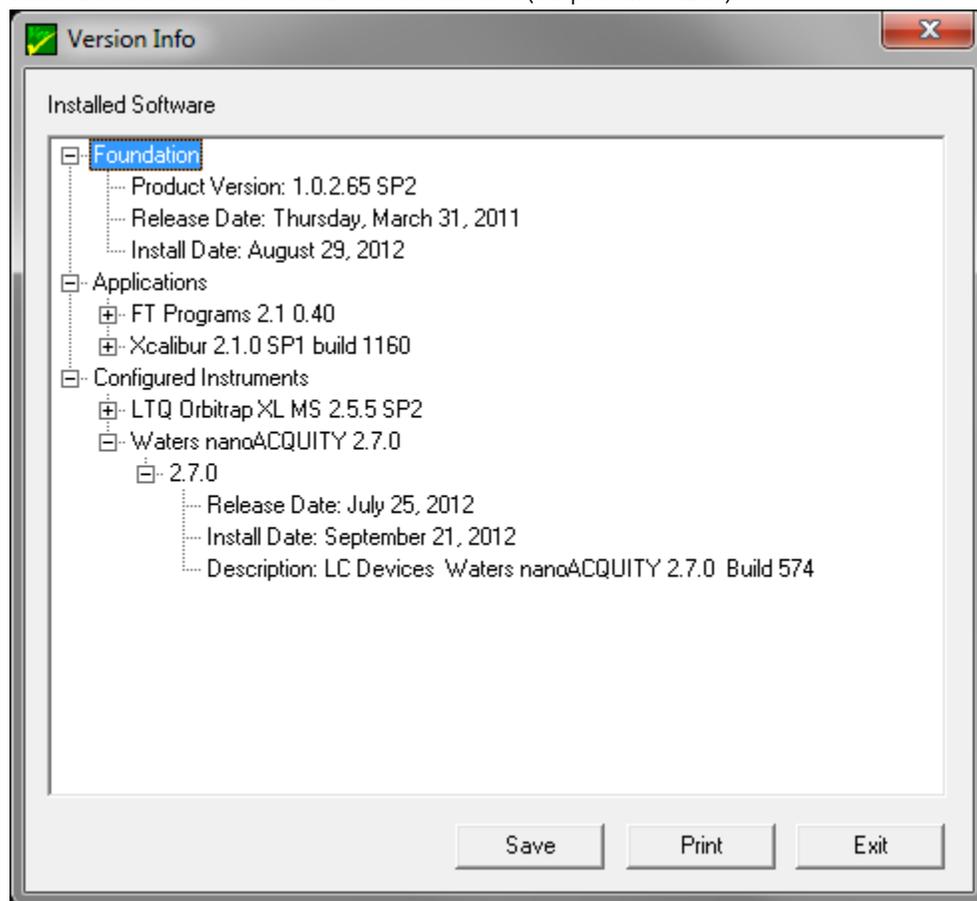
In this document we used an Orbitrap XL and a nanoAcquity with the software versions in the figure below. Your software version may be different but the Thermo engineer should be able to get you the latest software and also tell you compatibility with the nanoAcquity.

As of spring 2013 only 1D systems are supported.

Software version

Ideally software is already loaded on the mass spec computer, but you may have to install the HPLC software. You should have software from Thermo called LC_Devices. Load software (LC_Devices2.7 or whatever version you currently have), it will ask you what devices you want to install, select Waters.

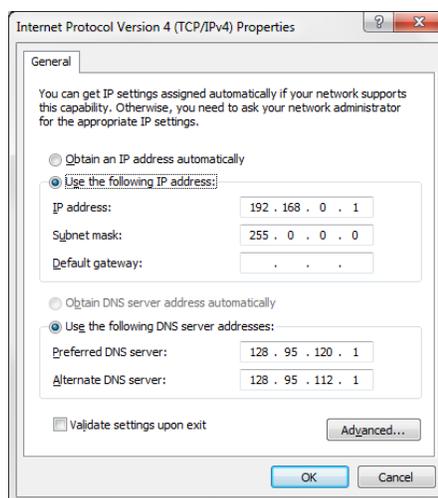
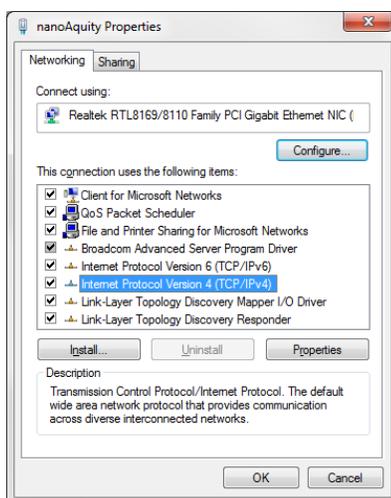
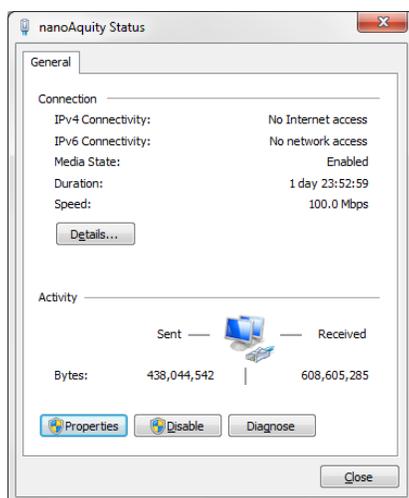
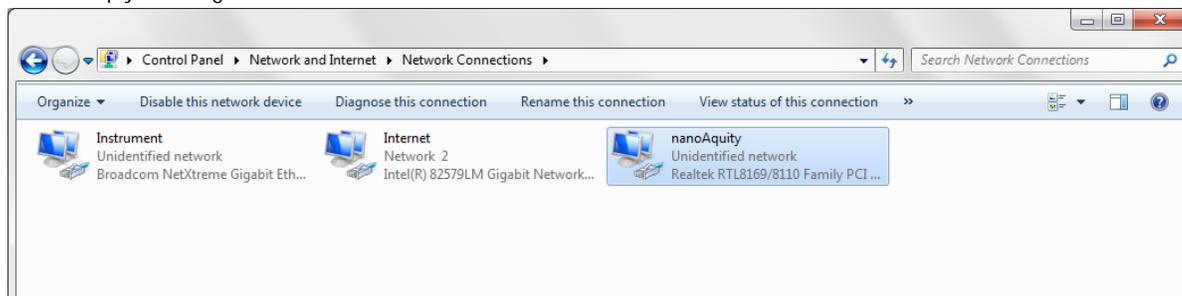
This is a screen shot of the software version we used (our pc is win7 32 bit):



Connecting the nanoAcquity to the mass spec PC

Install a dedicated third ethernet card and configure port to connect to nanoAcquity (IP address).

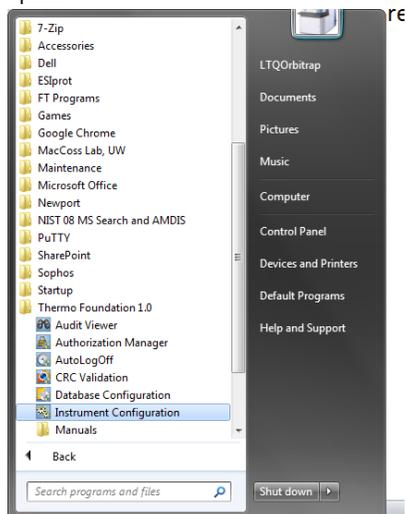
There are two Ethernet cards in the computer that comes with your mass spec, one is to connect to the mass spec and the other one to connect to the internet. We install a third card to connect to the nanoAcquity to the pc using the Ethernet cable you get with the nanoAcquity. The screen shots below should help you configure the card.



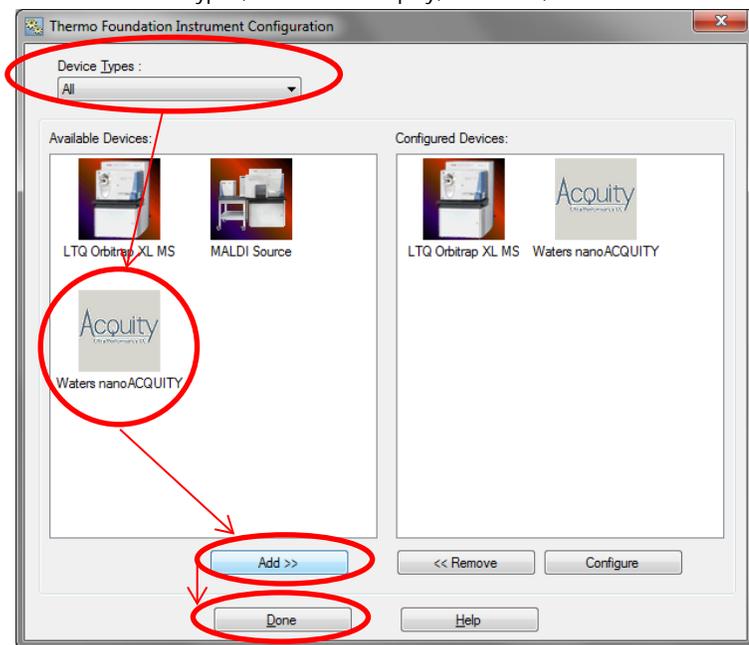
Configure instrument:

Next you need to configure the nanoAcquity in Xcalibur.

Close all mass spec related software (the Tune window can stay open) and open instrument configuration, be patient as this may take a minute to open:



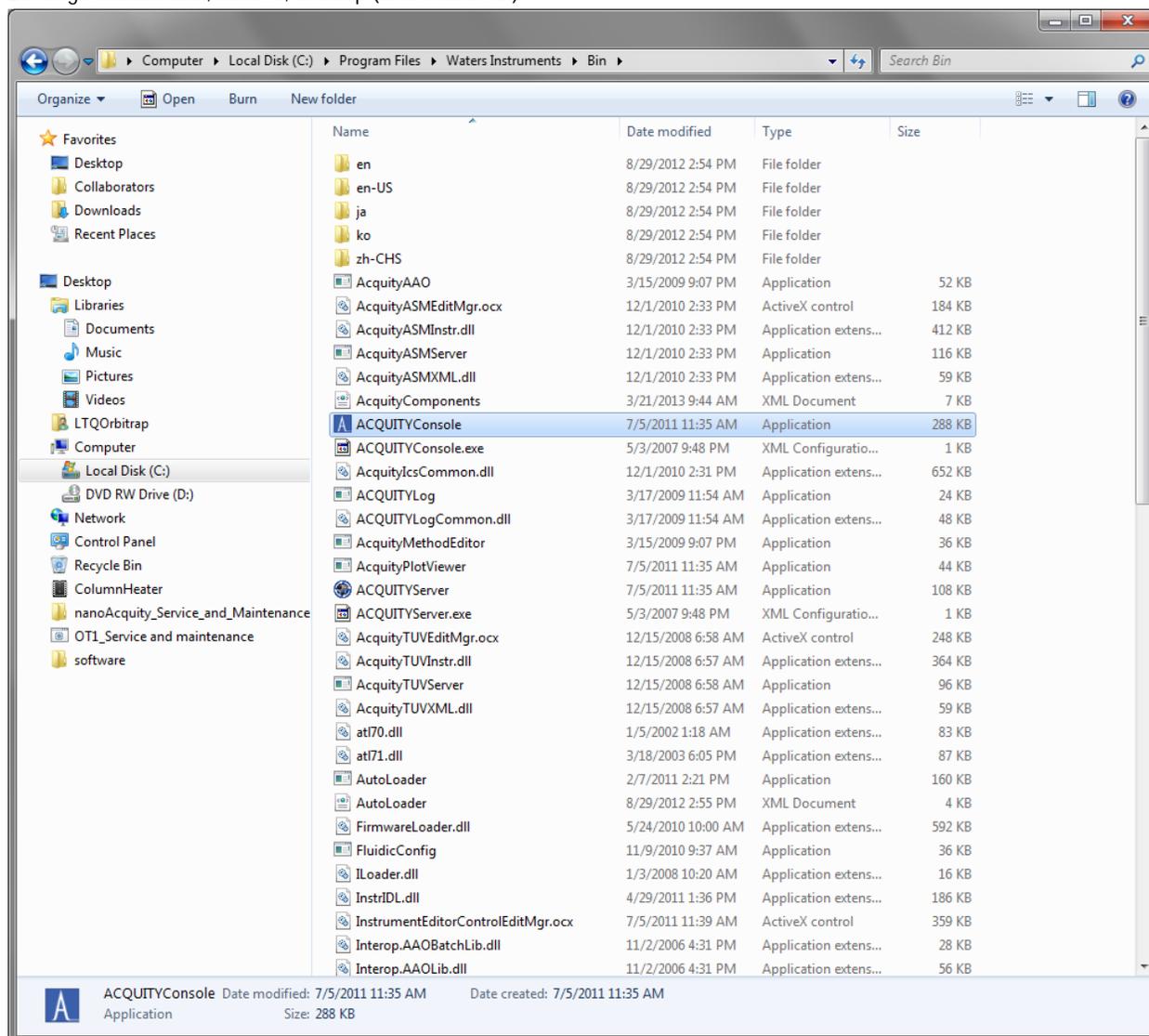
Select all Device Types, select nanoAcquity, hit Add>>, hit done



Now that when you open Xcalibur or the method editor you should see the nanoAcquity module.



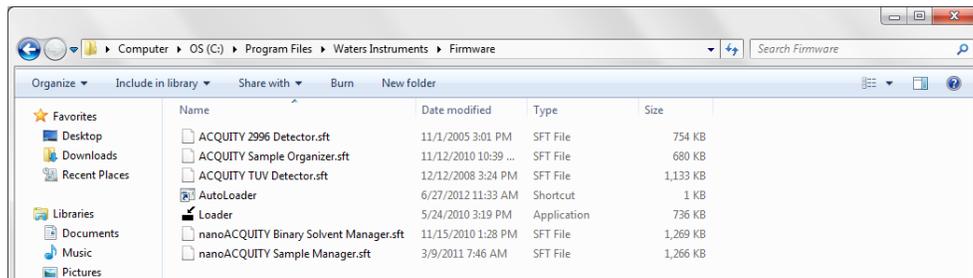
To directly control the nanoAcquity you need the nanoAcquity console:
 Do a right mouse click, send to, desktop (create shortcut)



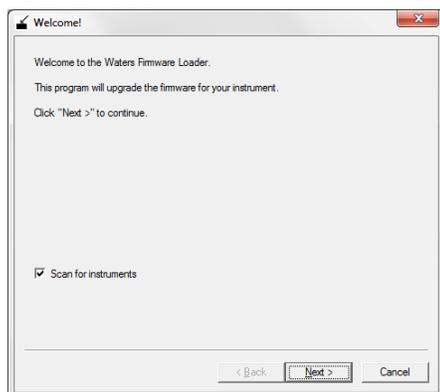
If you open the console you should be able to control the nanoAcquity, if your firmware version is correct. If not you may have to change the firmware.

nanoAcquity firmware change

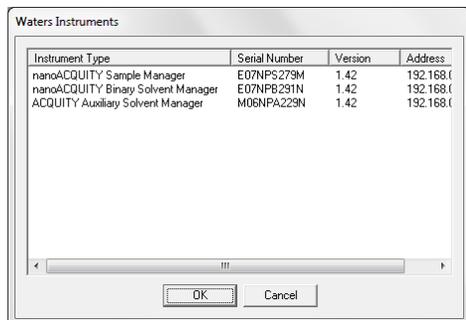
Firmware upgrade (if your system is under warranty or under service contract, let the waters engineer do it!):
 Otherwise find the loader:



Click on loader



Check Scan for instruments and hit next; You should see the modules attached to the pc (you'll likely only have the SM and BSM, not the ASM)



Highlight the first module and hit ok, I think it'll ask you if you want to load firm ware, click yes....

Then be patient (this takes several minutes) it will unload the old firmware, then load the new one (it'll show you some progress bar) and finally tell you to cycle power, turn the module power off and on again, then wait again.. it'll start up and the lights will keep flashing for about 10 mins (seems like forever.. so be patient or go get coffee...) Sometimes if you open the nanoAcquity console it will tell you in the status message that it is installing firmware...

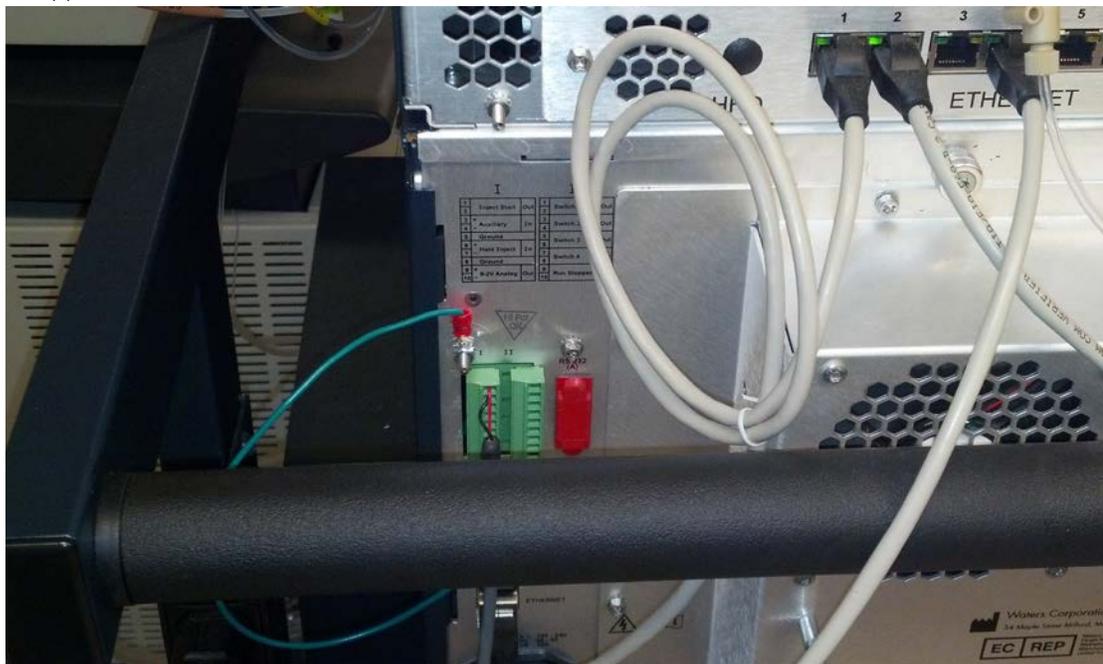
Then repeat for the second module... I always like to do one module at the time, but I think you can start them both in parallel.. I'm just not so comfortable with that kinda stuff so one at the time seems better for me... ☺
 Sometimes after it is all done you may have to restart the pc.. and/or cycle the power on the nanoAcquity again.

One thing I noticed there is no longer a trapping function with this particular firmware, but that's ok, we'll simply put a plug instead of the wasteline and "trap" at a low flow rate ... so no big deal.
 And if you inject more than 9µl, with a 10µl loop it does some strange double trapping, so I always inject ≤9µl.

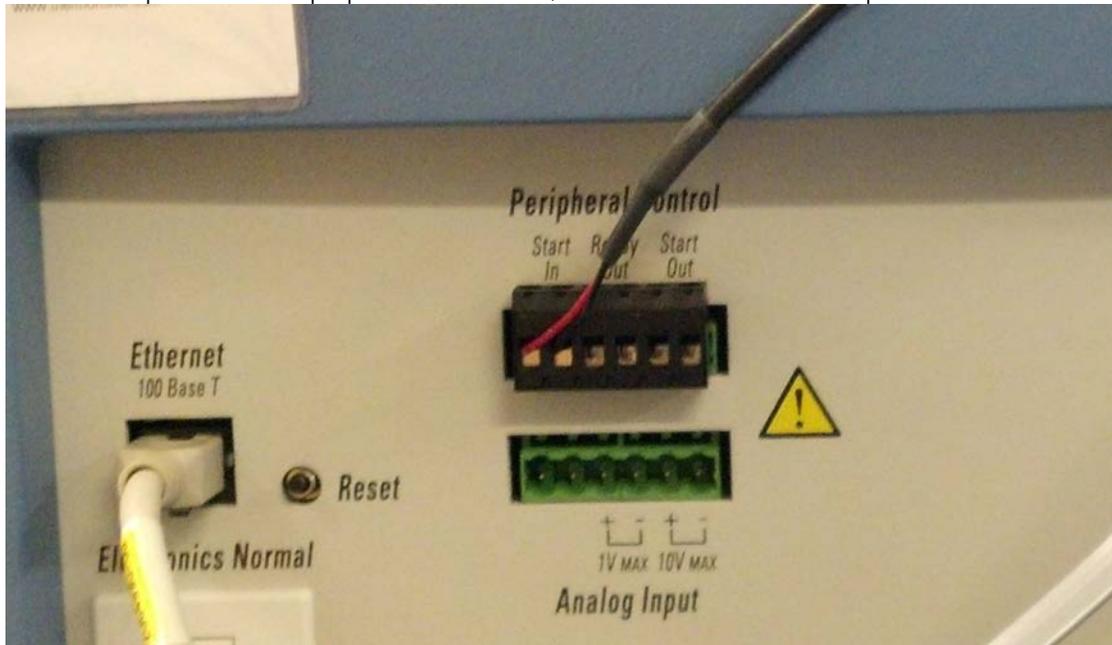
Contact Closure

We always got a contact closure cable with our mass spec, but you may have to make one yourself.

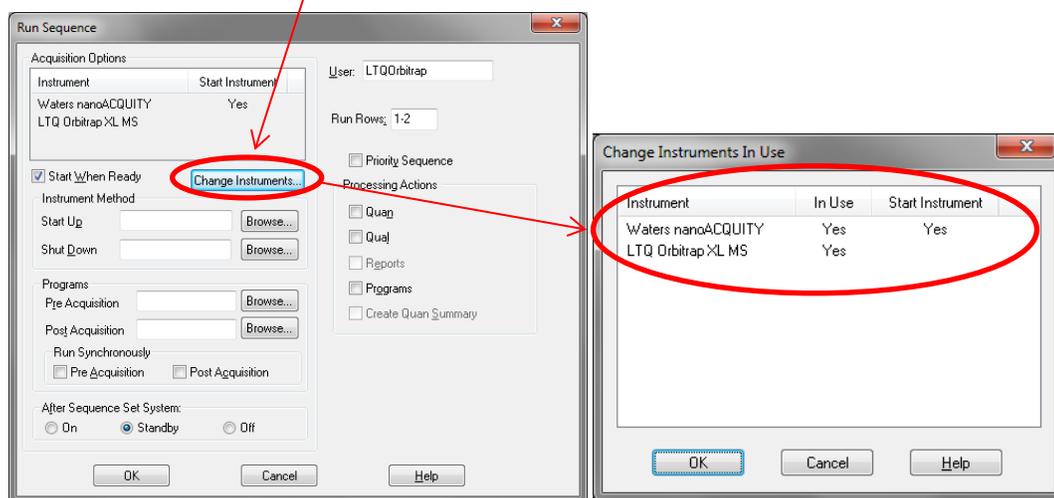
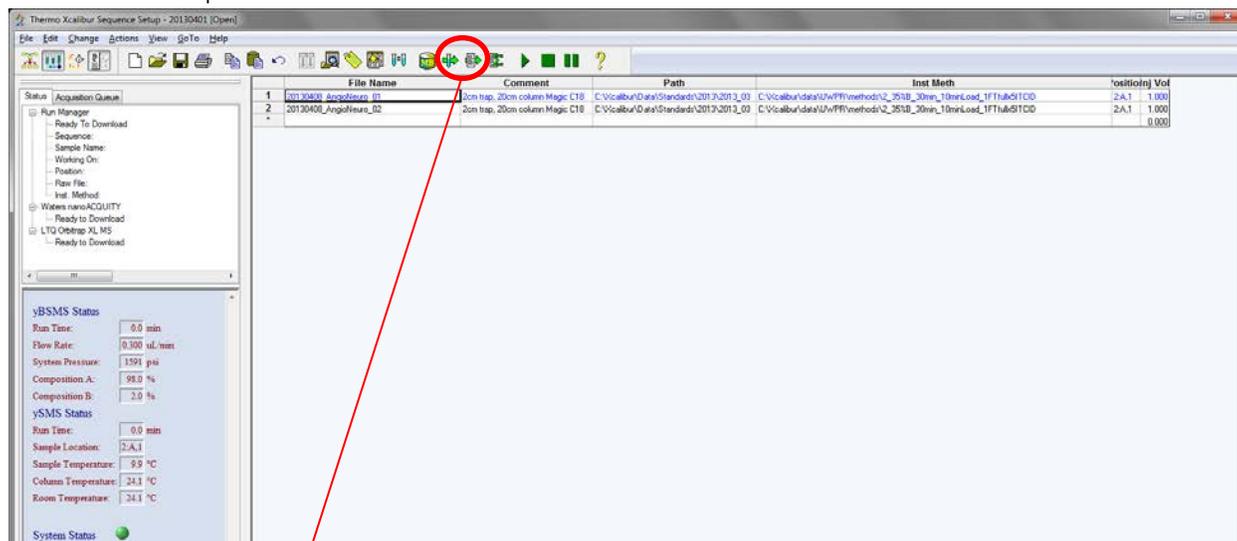
On the nanoAcquity SM backside plug use the top two slots "Inject start Out" and connect the red wire to the top (1) and the black wire to the second one (2)



On the mass spec side use the peripheral control start in, connect the red wire to the first position on the left and the black wire to the second position.



The nanoAcquity automatically triggers the contact closure (i.e. starts the mass spec acquisition) after the trapping is complete. Setup a new method and start a run out of xcalibur, hit the start sequence button, then hit change instruments and confirm that both instruments (hplc and mass spec) are in use and that the hplc is selected to start the instrument.



After hitting ok the nano will go through the injection and trapping. During that time the status of the mass spec should say waiting for contact closure. After the trapping is finished it will start acquiring data.

Please e-mail corrections/suggestions etc. to priska@uw.edu. Thanks!