MAX300-CAT Startup Guide

824285 Revision 1
February 2020

I. **Connecting the Hardware**

1. Connect the serial cable provided to the MAX300-CAT Mass Spectrometer Electronics

2. Connect other end of the serial cable to the USB to serial converter provided and connect the USB to the computer
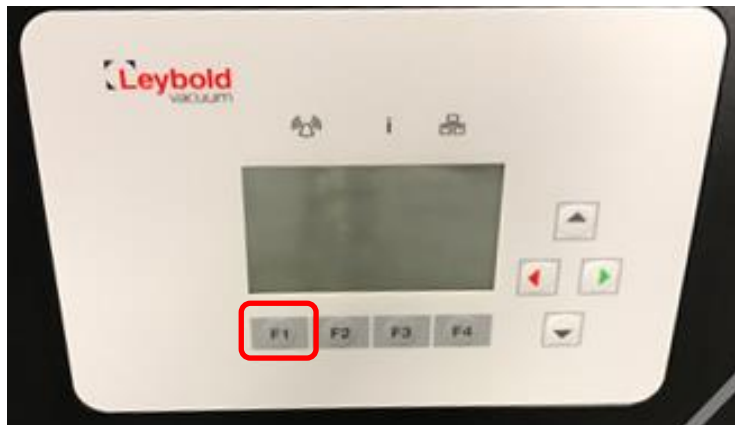

3. If a stream selector option was purchased, connect the gray serial cable from the MAX300 CAT stream selector to the serial port on the computer

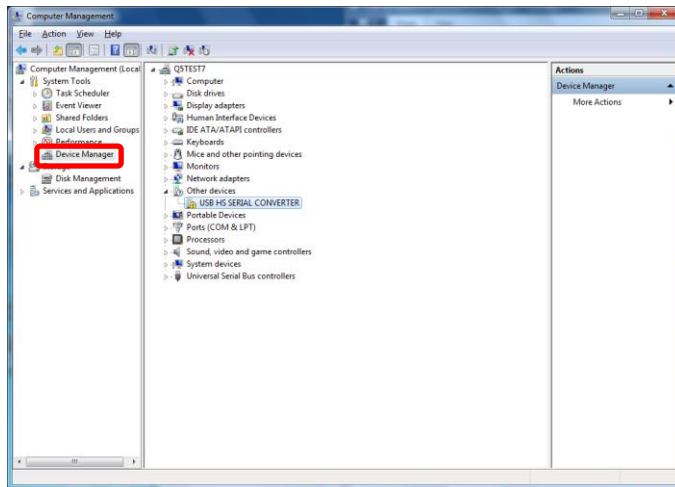4. Power ON the Pumping station
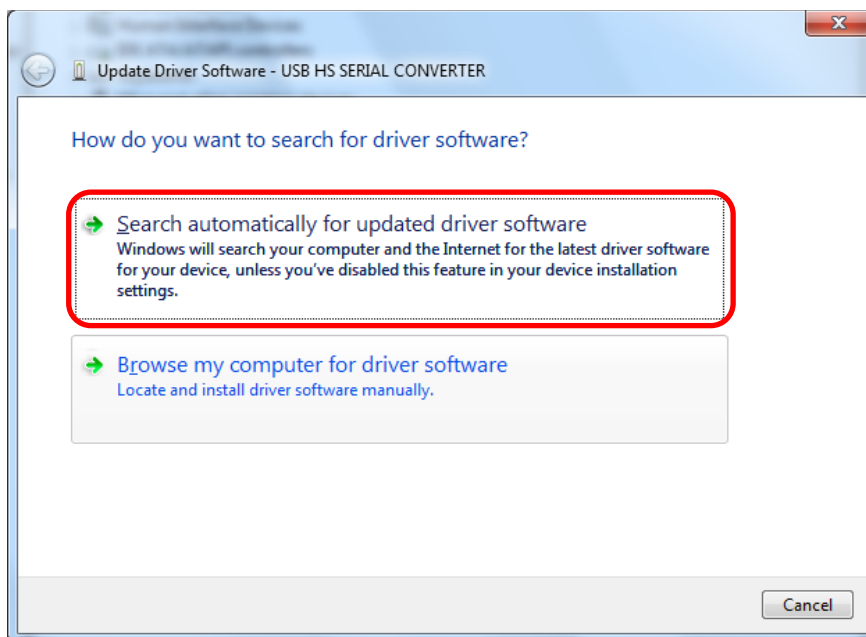

5. Press the START button (F1) on the pump.

II. Install the USB to RS-232 Serial Converter Driver.

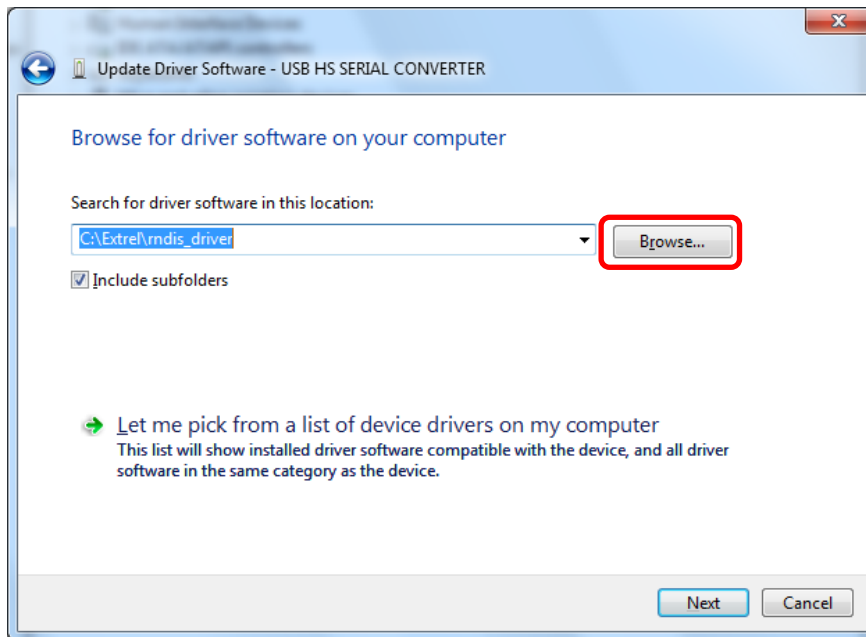**For Windows 7: (See next section for Windows10 instructions)**

1. Power on the Computer

2. Right-click "My Computer" and select "Manage"

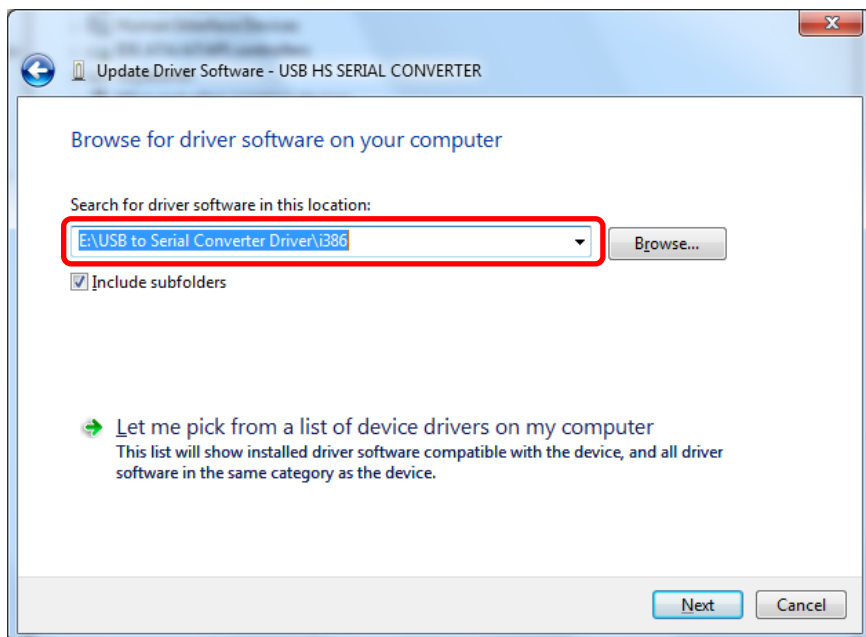3. Click "Device Manager"

4. Right-click "USB HS SERIAL CONVERTER" and select "Update Driver Software"

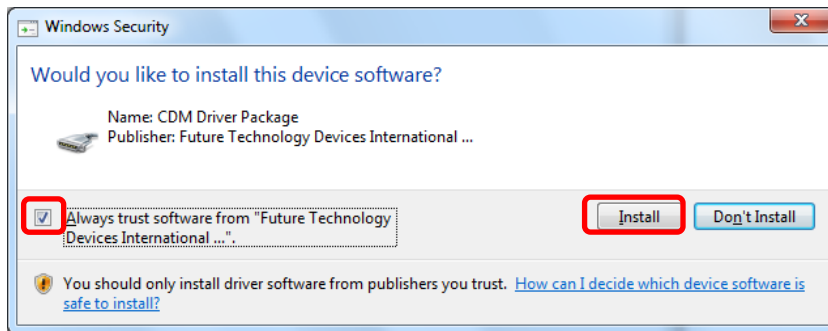5. Choose "Browse my computer for driver software"
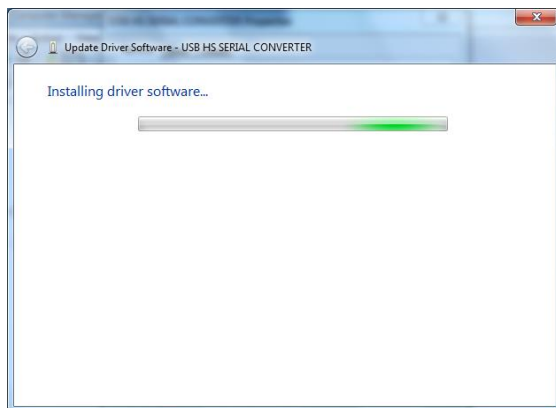
6. Click the "Browse" button

7. Choose the folder "i386" inside the "USB to serial Converter Driver" folder on the USB disk provided
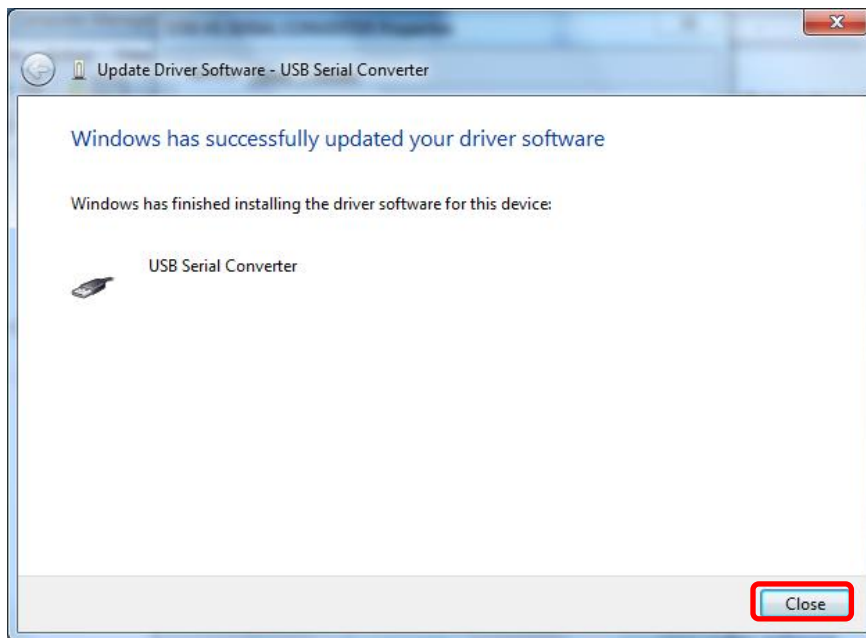
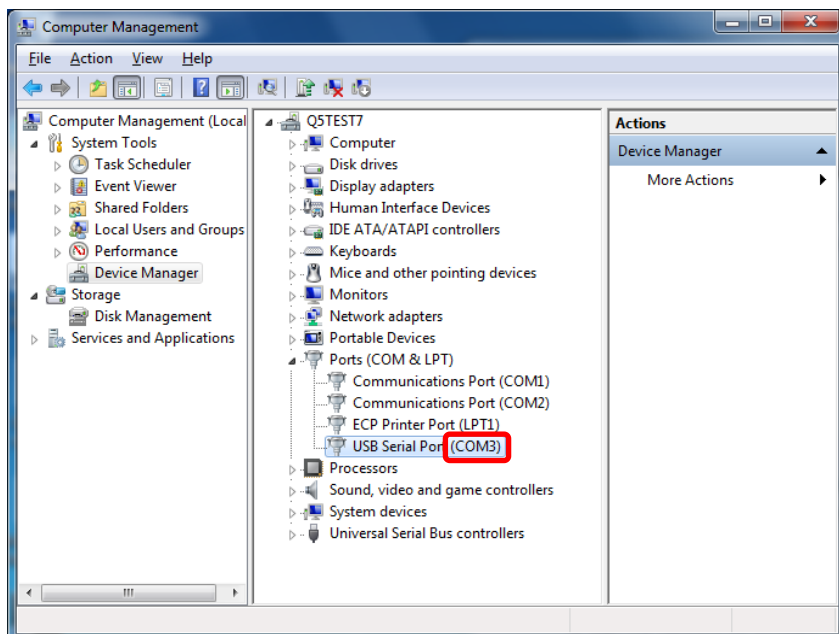8. Check the box labeled "Always trust software from...""" and click the "Install" button

9. Allow the software to complete the installation
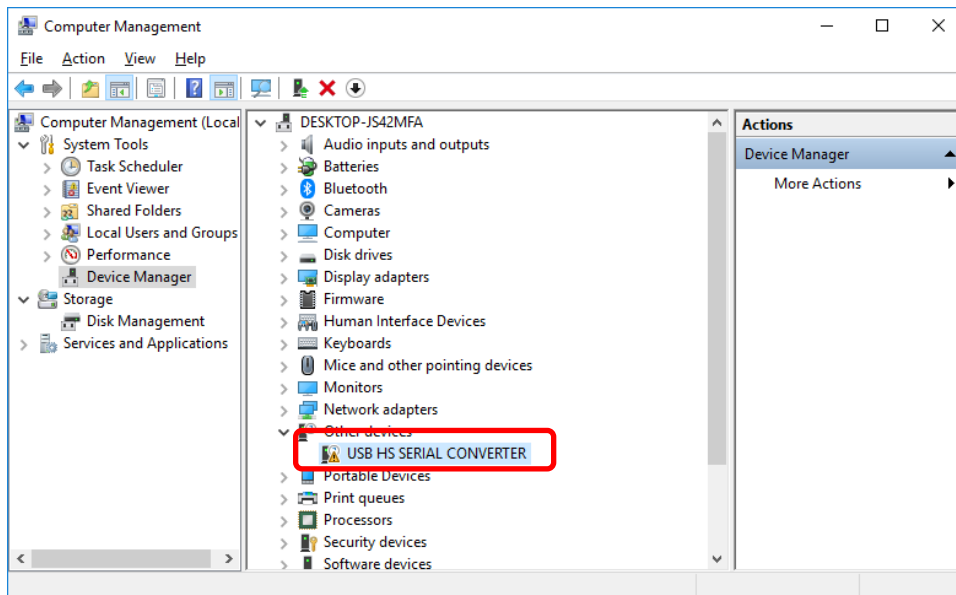

10. Click the "Close" button
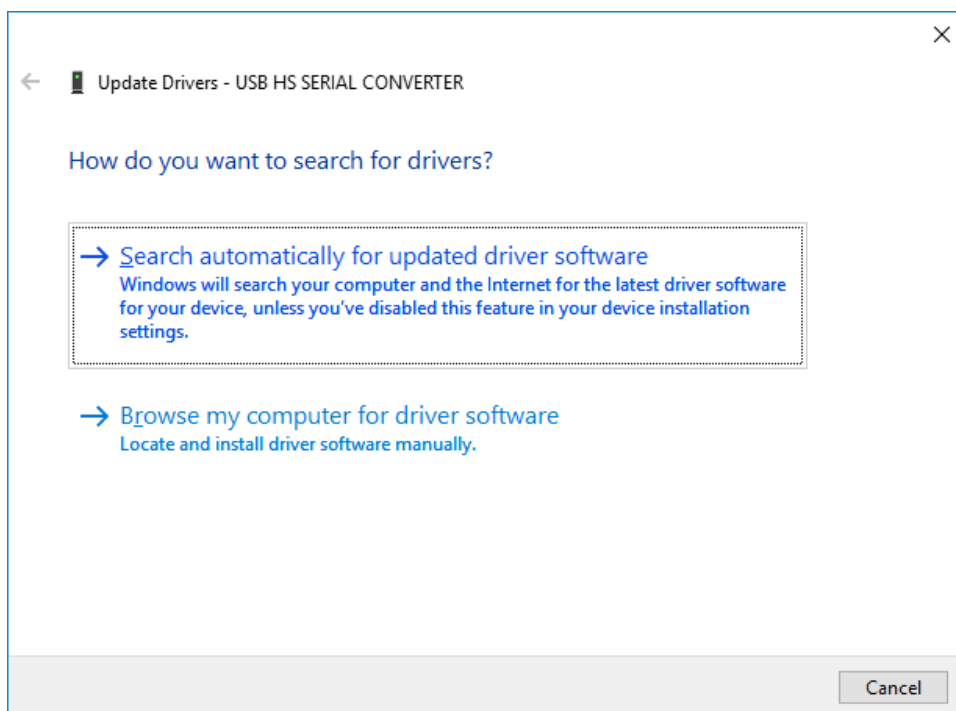
**NOTE which COM port is labeled "USB Serial Port"

USB to Serial Converter driver installation for Windows10

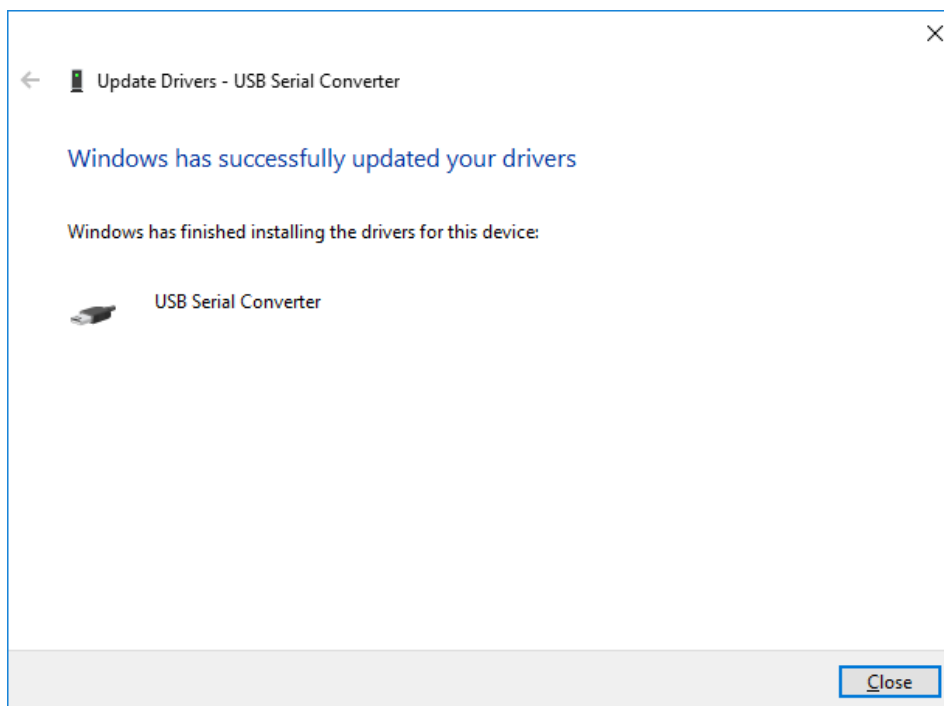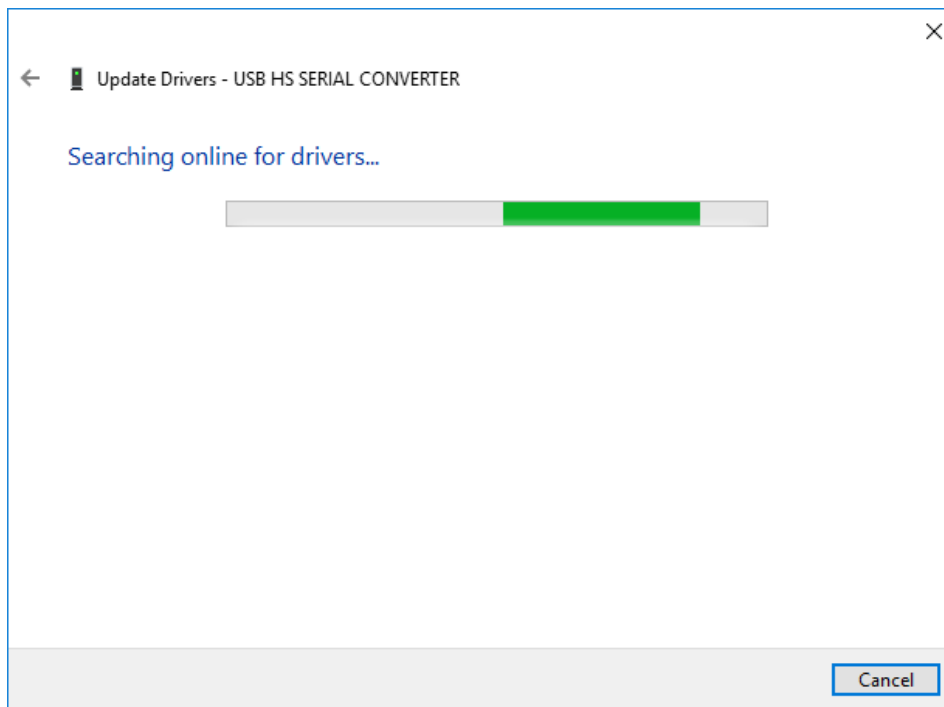**Note: The Computer should have a valid Internet connection to complete this step.**

1. Power on the Computer

2. Right-click "This PC" and select "Manage"

3. Click "Device Manager"

4. Right on "USB HS SERIAL CONVERTER" and select "Update Driver"

Update Drivers - USB HS SERIAL CONVERTER

Searching online for drivers...

Cancel

Update Drivers - USB Serial Converter

Windows has successfully updated your drivers

Windows has finished installing the drivers for this device:

USB Serial Converter

Close

**Note down which COM port is labeled "USB Serial Port". This port name must be specified in the instrument configuration file as described in a later step.
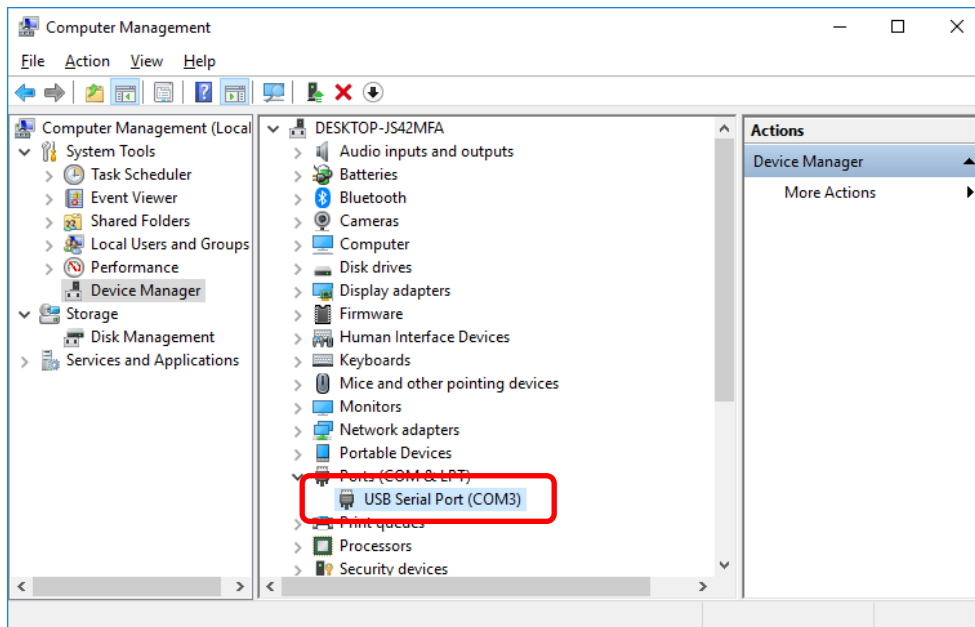
III. PC Setup

Make sure the Power options are set in the Windows so that the PC would never goes to sleep mode. If the PC goes to sleep while collecting scan data, system will be stalled and collection stops.

You can access the Power options window from Control Panel – System and Security – Power Options. Set the options to "Never" sleep as shown below:
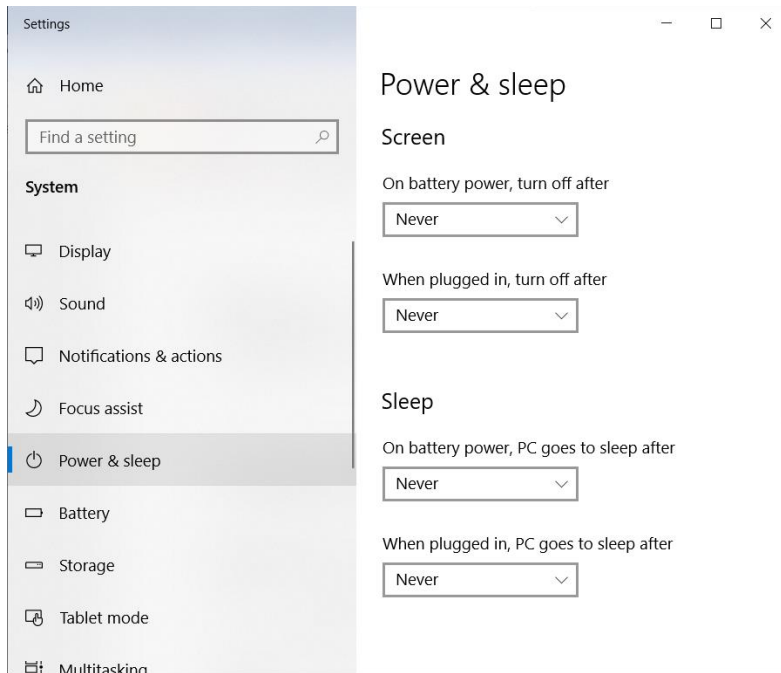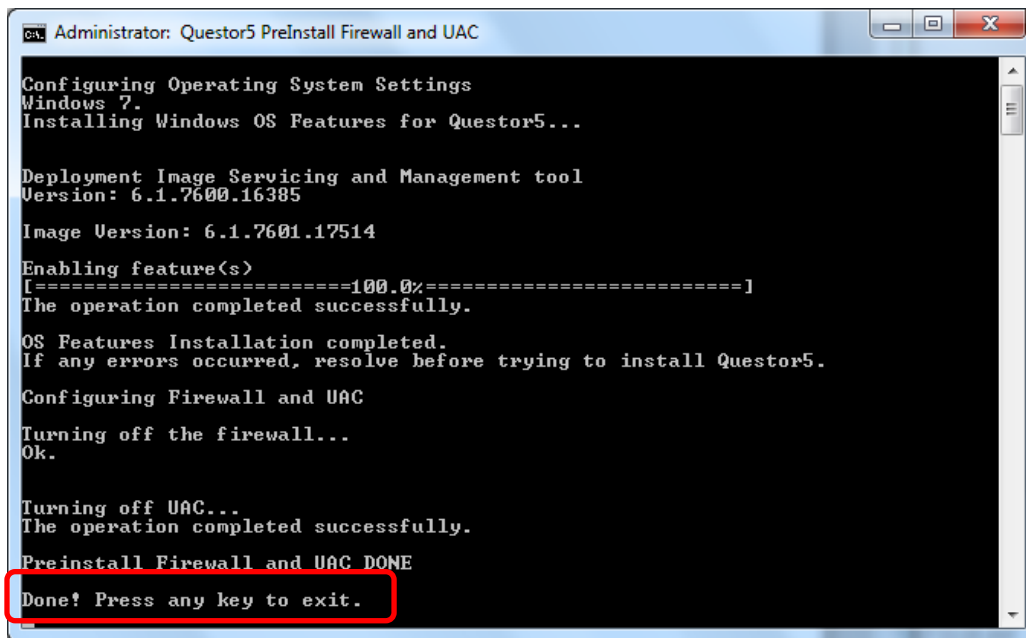

IV. Software Installation and Setup

Install the Questor5 Software

8. Locate the "pre_install.bat" file in the "Questor5" folder on the USB disk provided

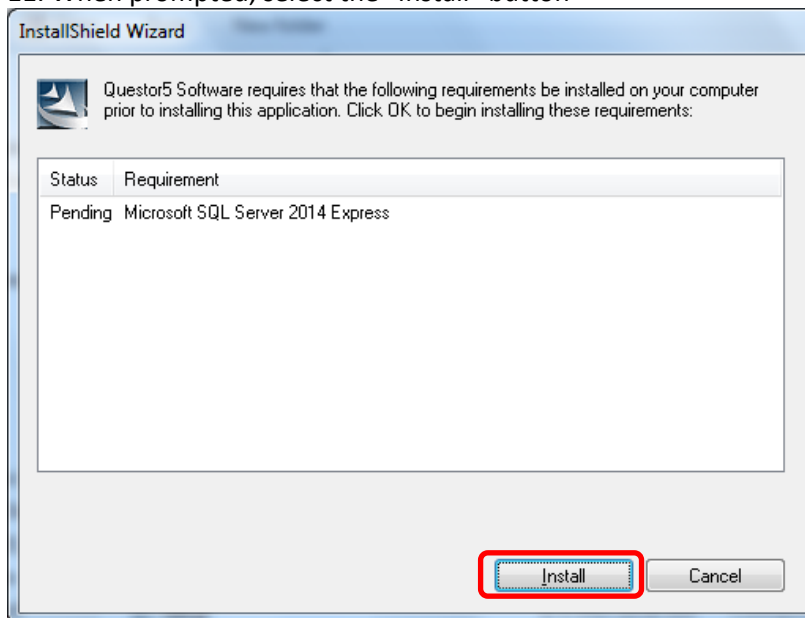   Right-click & select "Run as Administrator" option

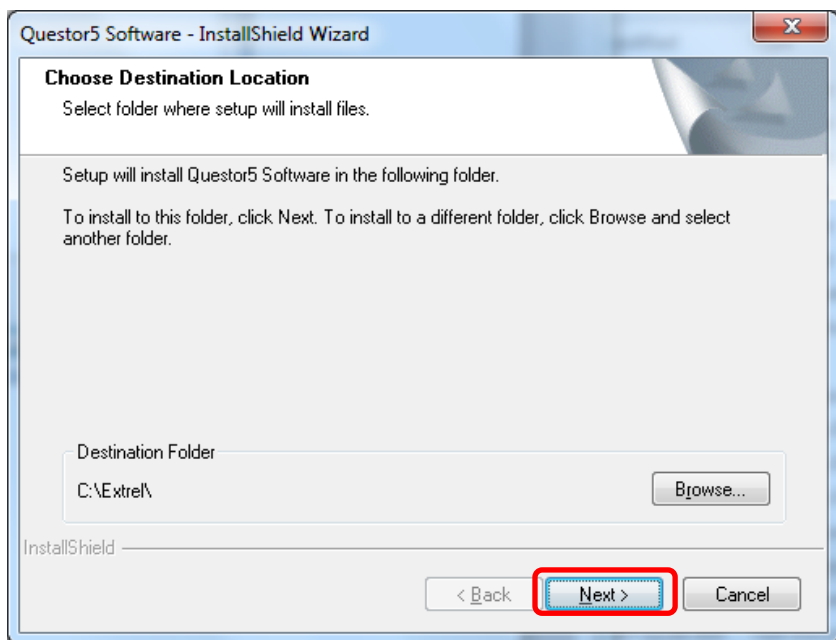9. When the installer finishes, press any key to exit.

10. Locate the "setup.exe" file in the "Questor5 folder on the USB disk provided
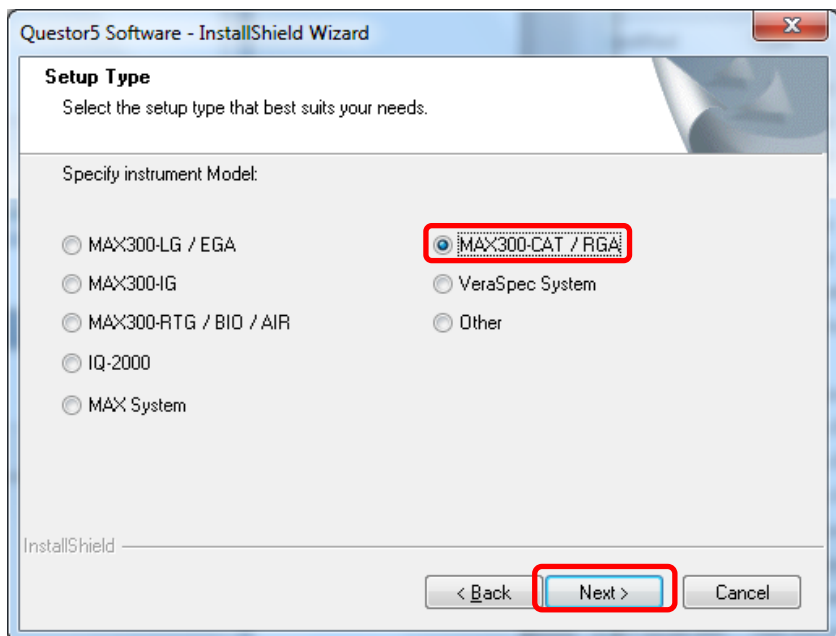
Right-click & select "Run as Administrator" option

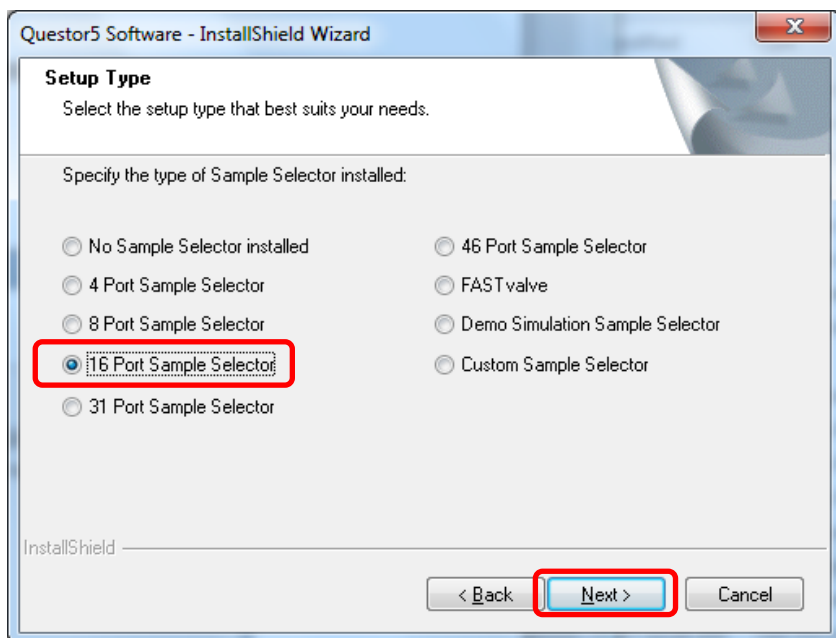11. When prompted, select the "Install" button
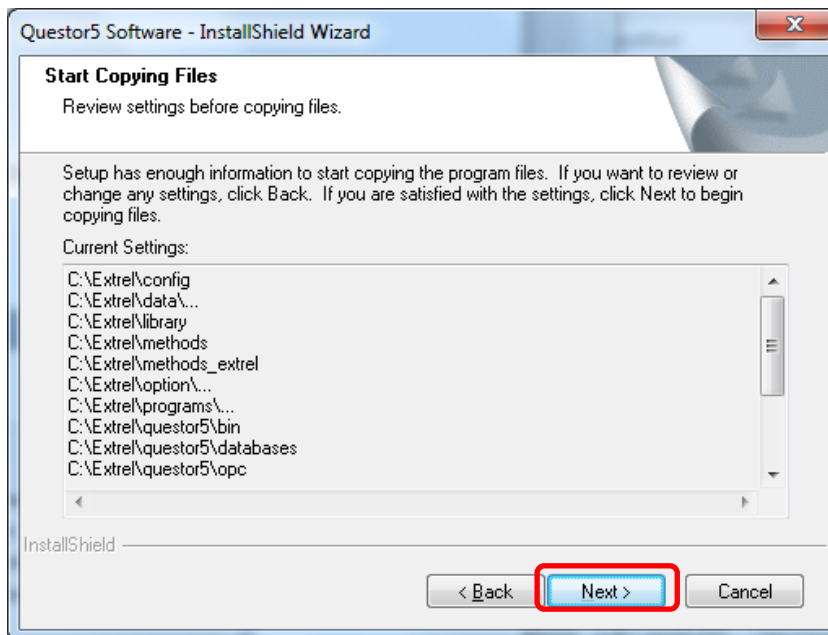

12. Click "Next"

13. Choose "MAX300 CAT / RGA"

14. Select the sample selector option purchased with the system (if no sample selector option was purchased, choose "No Sample Selector installed")

Questor5 Software - InstallShield Wizard

Setup Type
Select the setup type that best suits your needs.

Specify the type of Sample Selector installed:

- ○ No Sample Selector installed
- ○ 4 Port Sample Selector
- ○ 8 Port Sample Selector
- ◉ 16 Port Sample Selector
- ○ 31 Port Sample Selector

- ○ 46 Port Sample Selector
- ○ FAST valve
- ○ Demo Simulation Sample Selector
- ○ Custom Sample Selector

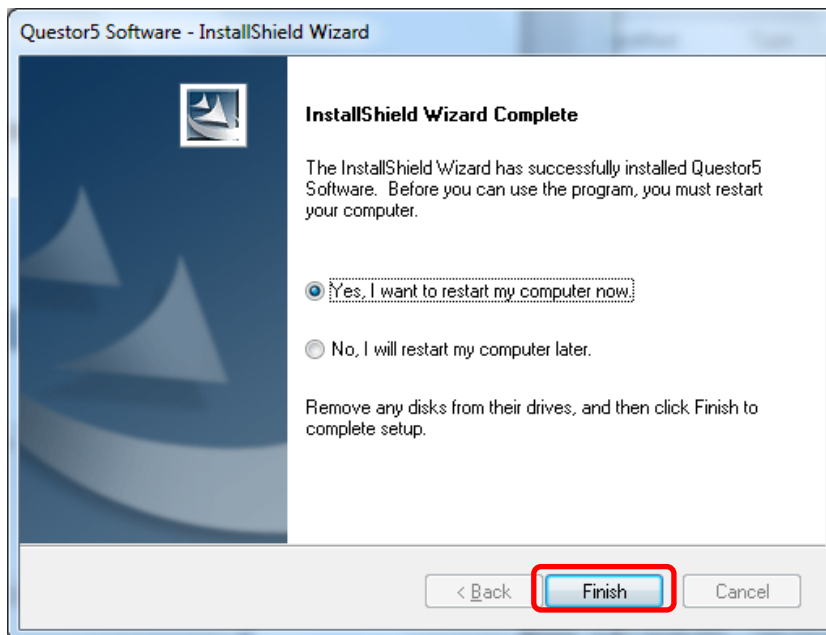InstallShield

[< Back] [Next >] [Cancel]

15. Click "Next"

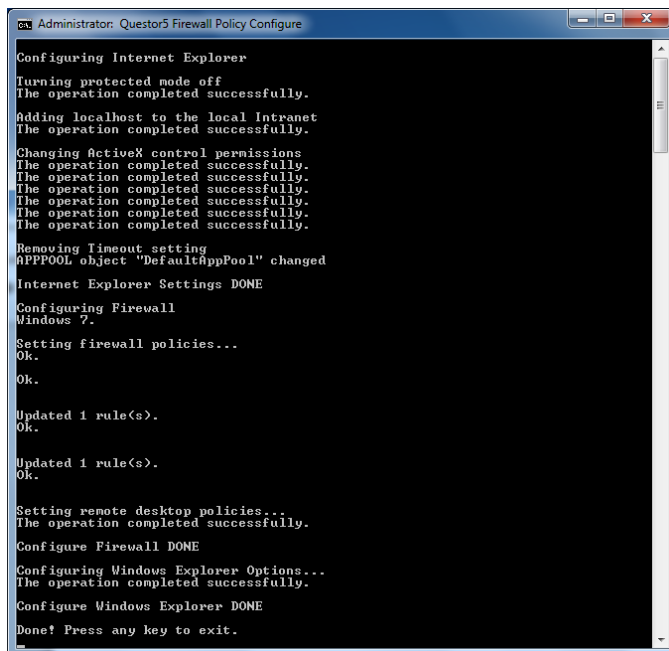
16. Wait for the software to complete its installation
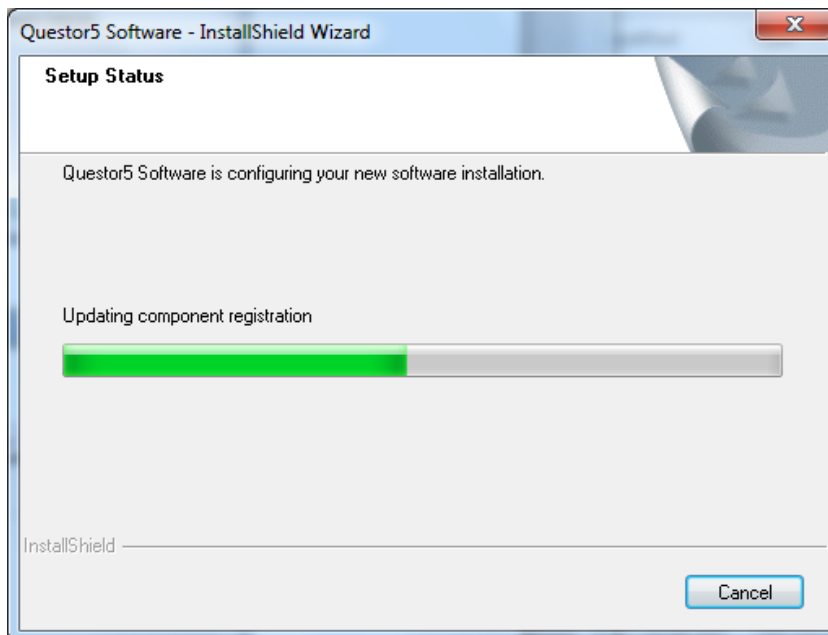
17. Click "Finish" to complete the installation and restart the computer

18. Locate the "post_install.bat" file in the "Questor5" folder on the USB disk provided

   Right-click & select "Run as Administrator" option

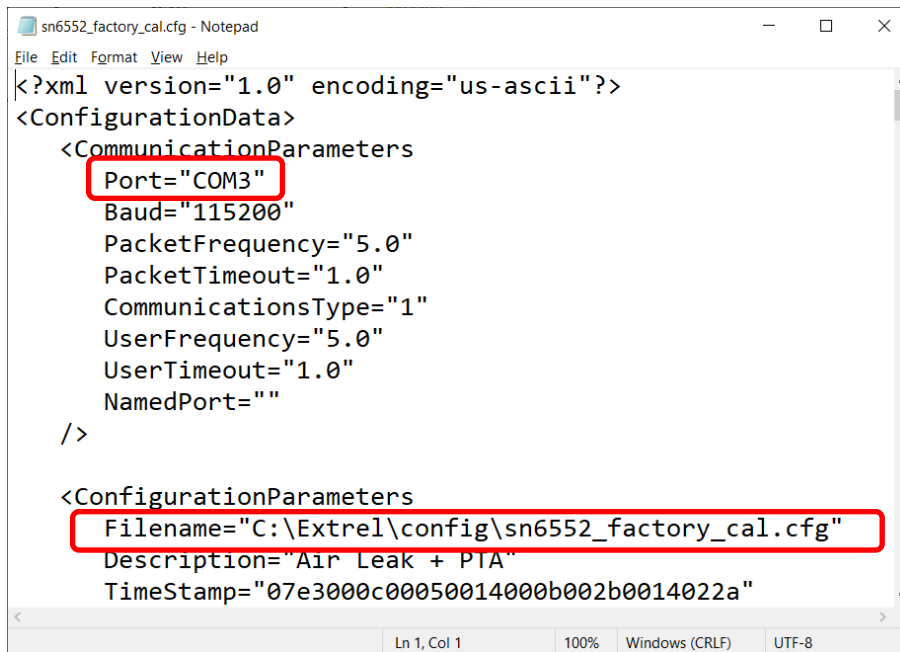19. When the installer finishes, press any key to exit

20. Reboot the computer

C. Software Setup

1. Copy the Configuration File for the instrument "sn####_factory_cal.cfg" from the "Customer Files" folder on the USB disk to the C:\Extrel\config folder.

2. Open the above file in notepad and modify the "Port" attribute to the same port name noted during the USB serial converter driver installation.

3. Change the path in the "Filename" attribute to "C:\Extrel\Config\" as shown below:

```
sn6552_factory_cal.cfg - Notepad                          —    □    ×
File  Edit  Format  View  Help
<?xml version="1.0" encoding="us-ascii"?>
<ConfigurationData>
    <CommunicationParameters
        Port="COM3"
        Baud="115200"
        PacketFrequency="5.0"
        PacketTimeout="1.0"
        CommunicationsType="1"
        UserFrequency="5.0"
        UserTimeout="1.0"
        NamedPort=""
    />

    <ConfigurationParameters
        Filename="C:\Extrel\config\sn6552_factory_cal.cfg"
        Description="Air Leak + PIA"
        TimeStamp="07e3000c00050014000b002b0014022a"

            Ln 1, Col 1        100%    Windows (CRLF)    UTF-8
```

4. In the same file, make sure the "ScanSpeed" is set to 144, "SamplesPerAMU" to 20 and "FilamentForceOffStartup" to 1 as highlighted below:

```
sn6552_factory_cal.cfg - Notepad                        —    □    ✕

File  Edit  Format  View  Help

    <ScanParameters
        ScanSpeed="144"
        LowMass="1"
        HighMass="310"
        SamplesPerAMU="20"
    />

    <OperatingParameters
        Mode="Mass sweep"
        Focus1="-22"
        Focus2="-68"
        ElectronEnergy="70"
        FilamentEmission="2.0"
        AutoZero="Off"
        ScanMode="Sweep"
        Filament="1"
        PressureUnits="Torr"
        EnableElectronMultiplier="0"
        MultiplierVoltage="1020"
        FilamentForceOffStartup="1"
    />

        Ln 15, Col 21        100%    Windows (CRLF)    UTF-8
```
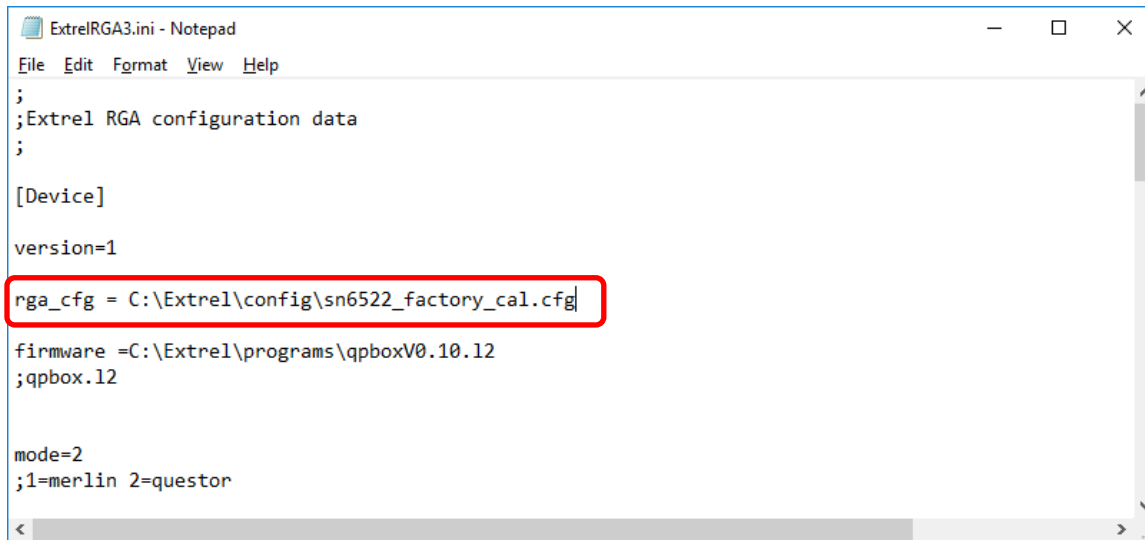
5. Keep a note on the highlighted values, this may need to apply while tuning the instrument.

```
sn6552_factory_cal.cfg - Notepad                        —    □    ✕

File  Edit  Format  View  Help

    <CalibrationParameters
        LowCalMass="1"
        LowCalResolution="610"
        LowCalPosition="0.42"
        LowCalIonEnergy="5.0"
        HighCalMass="300"
        HighCalResolution="2345"
        HighCalPosition="0.50"
        HighCalIonEnergy="5.0"
        TotalAmpOffset="2000"
        PartialAmpOffset="2200"
        TotalIntegratingCap="10.00"
        PartialIntegratingCap="3.00"
        RFSettleTime="50"
        SWSettleTime="10"
        Pirani1ATM="1.86300"
        PiraniZero="0.28700"
        PiraniAutoRecalibrate="0"
        PartialSensitivity="6.00e-004"
        TotalSensitivity="1.00e+001"
        debug="0"
    />

        Ln 1, Col 1        100%    Windows (CRLF)    UTF-8
```

6. Open the file ExtrelRga3.ini from "C:\Extrel\Programs" folder in notepad and modify the attribute "rga_cfg" to point to the cfg file referenced in step 1.
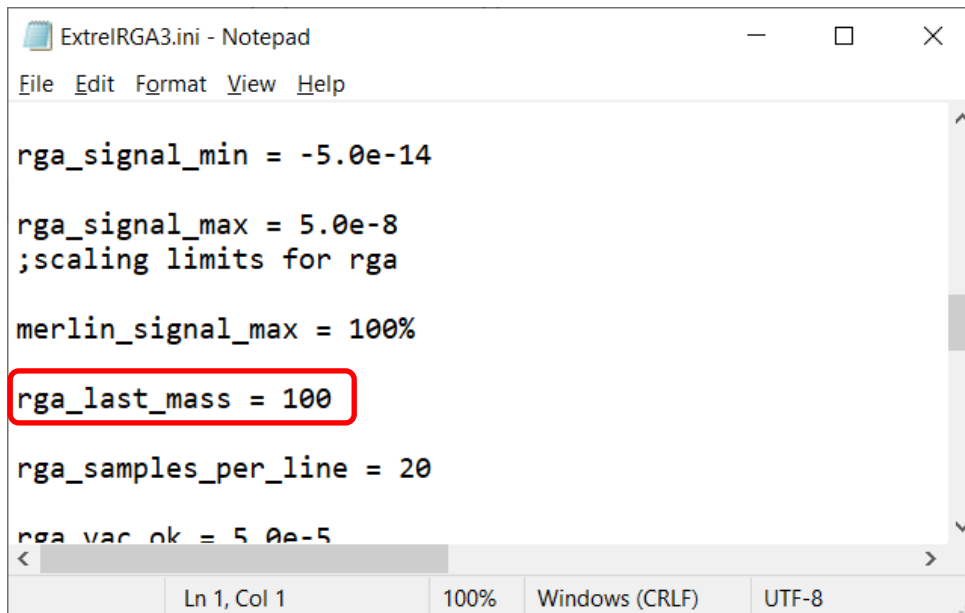
7. In the same file, change the "rga_last_mass" to 100 or 300 based on the mass range of your system as shown below:
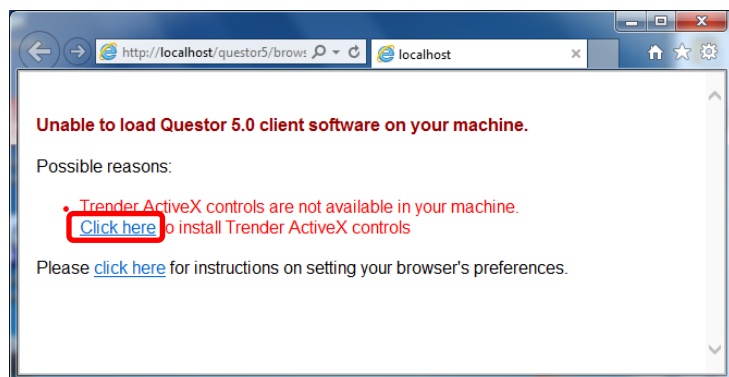
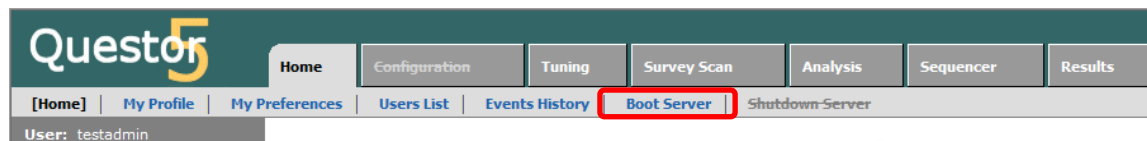

8. Select the Questor5 Software from the Desktop.

9. Install ActiveX controls by clicking the "Yes" button
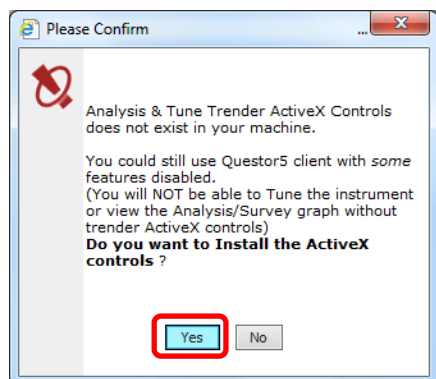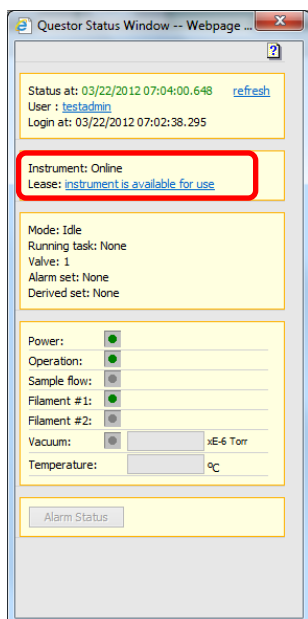

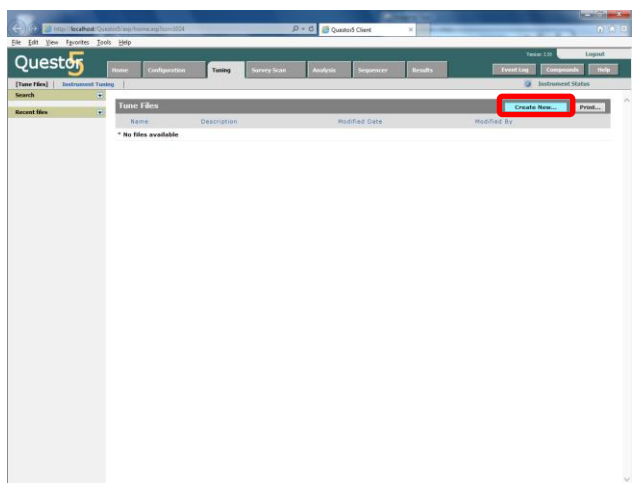10. Choose "Click here" to install ActiveX controls

11. Click "Boot Server"

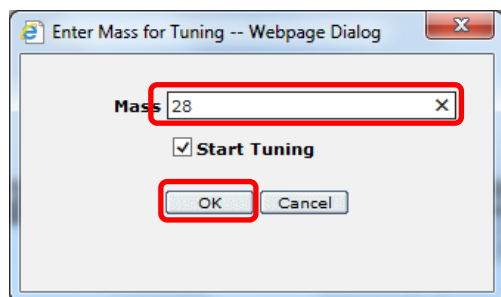12. Ensure the instrument is online by clicking "Instrument Status"
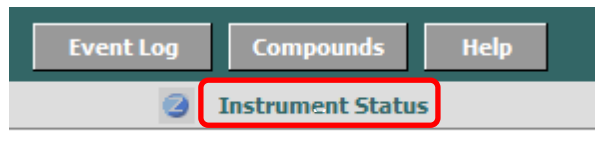
13. Select the "Tuning" tab, and click "Create New"

14. Name the Tune File and click "OK"
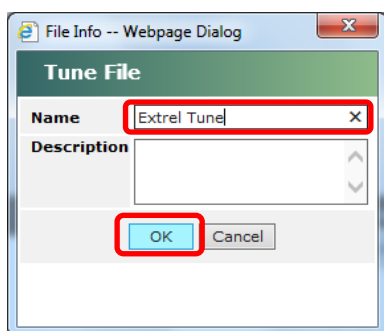
15. Select a mass to start tuning and click "OK"

16. Change the tuning start and end masses from 27.5 and 28.5 to 1 and 50, respectively and click "Apply" button. If this is the first time that the instrument has been turned on allow it to run in this mode for at least **3 hours** before attempting to fine-tune the peaks.
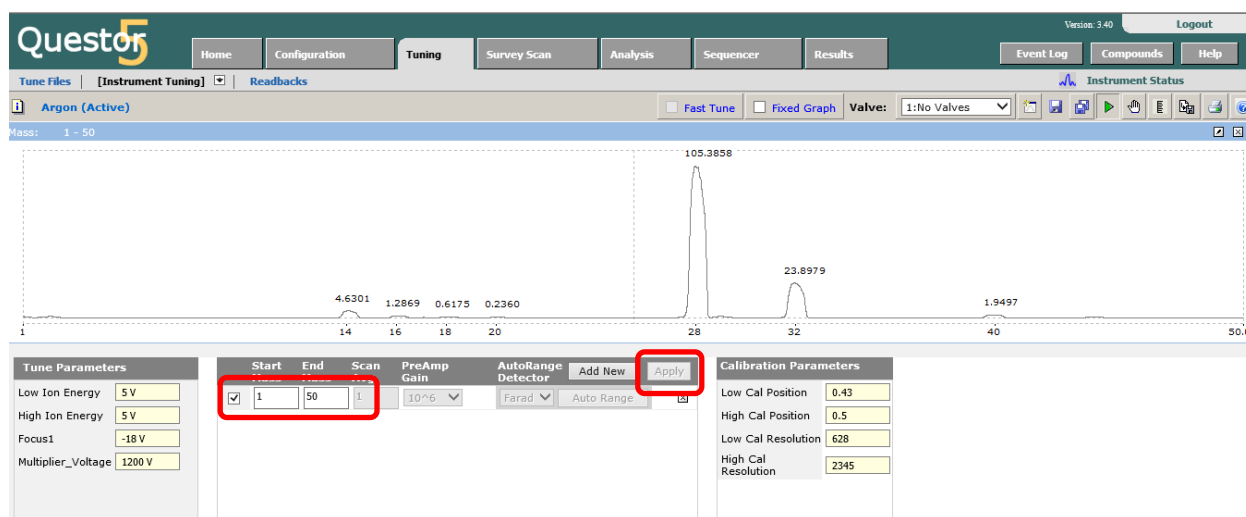

17. In order to accurately tune the peak position and width, create multiple mass ranges 2 amu wide by clicking the "Add New" button. For example, if the instrument is running in air these mass ranges can be useful: 13 – 15 amu, 27 – 29 amu, 31 – 33 amu and 39 – 41 amu. Display these mass ranges and the corresponding peaks side-by-side by clicking the check box to the left of the mass range as shown in the Figure below.

First the resolution must be adjusted so that the peaks are approximately 1 amu wide at their base. To check the width place the mouse to the left and right of each peak and the mass position will be shown in the upper right corner of the corresponding window. The peak width can be adjusted by changing the "Low Cal Resolution" and "High Cal Resolution" parameters which, as the names say, affect more the low and high mass peaks, respectively.
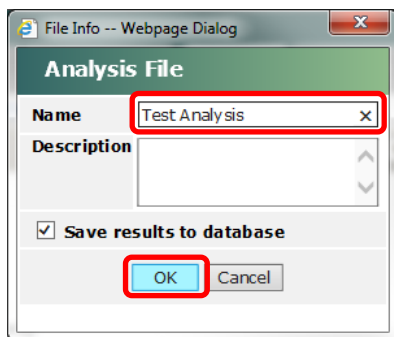
After the resolution has been tuned the peak positions can be adjusted by changing the "Low Cal Position" and "High Cal Position" parameters.
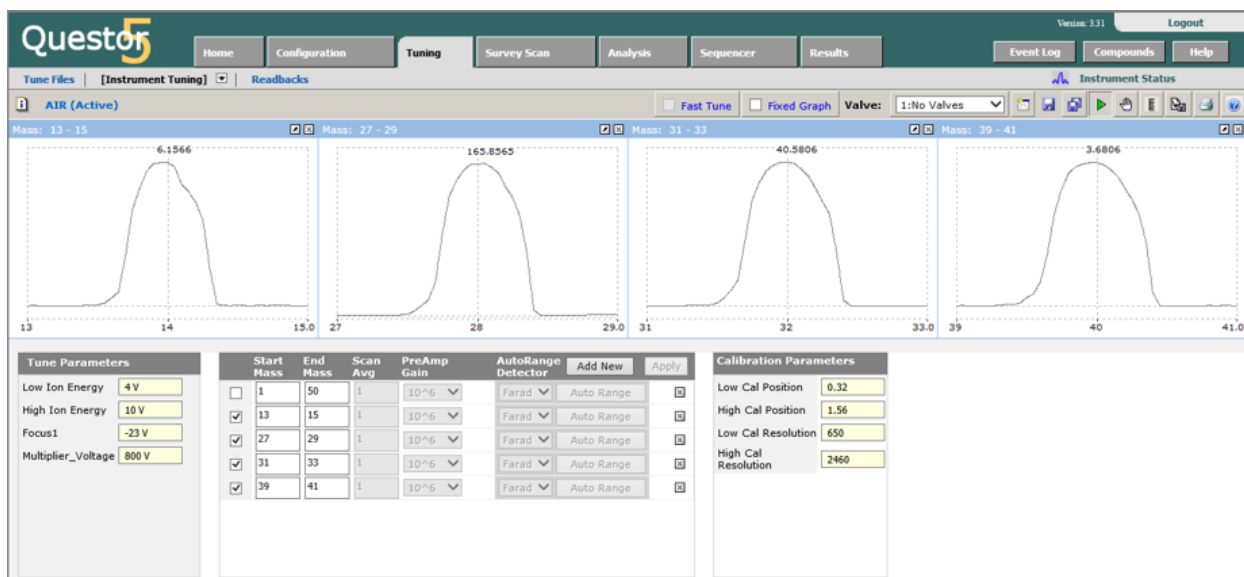
18. Create an analysis file by selecting the "Analysis" tab and clicking "Create New"
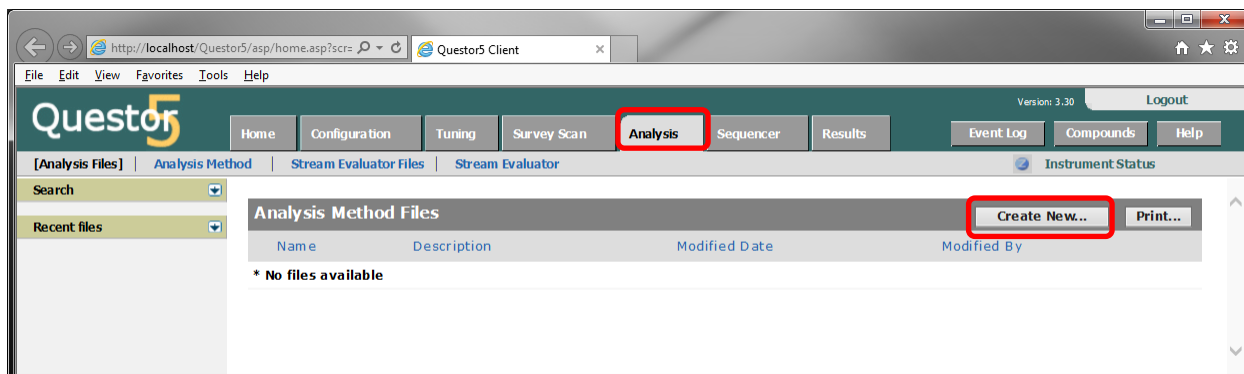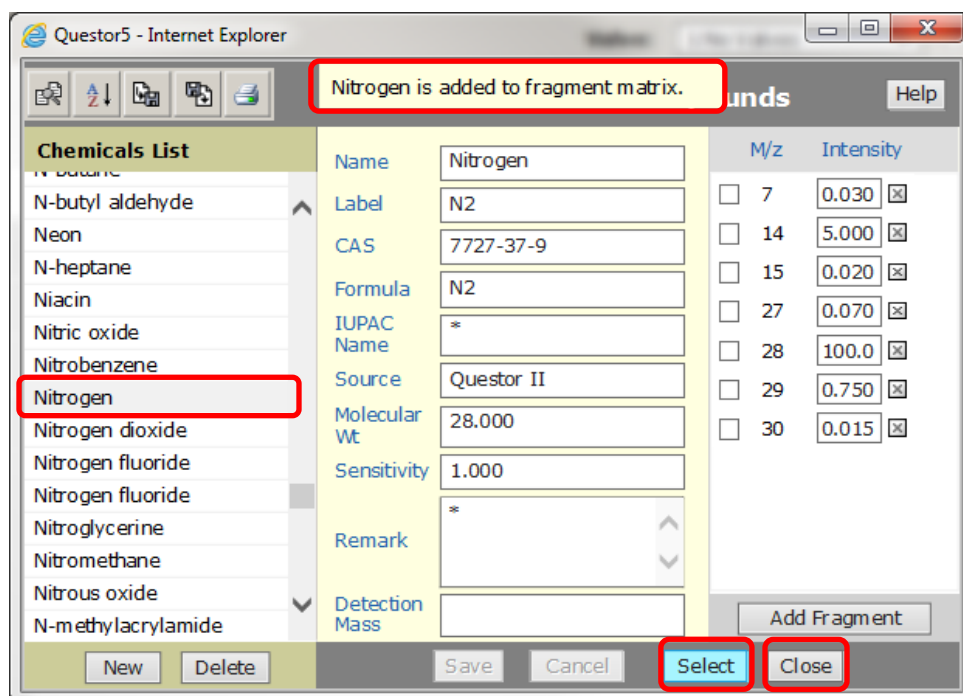

19. Name the Analysis File and click "OK"

20. Select each of the components in the analysis sample or experiment, one at a time, from the Chemicals List and click the "Select" button. A message will appear near the top of the window saying that the component has been added to the fragment matrix. Once all components have been selected,

click the "Close" button.

21. Click the "Save" button to save the analysis
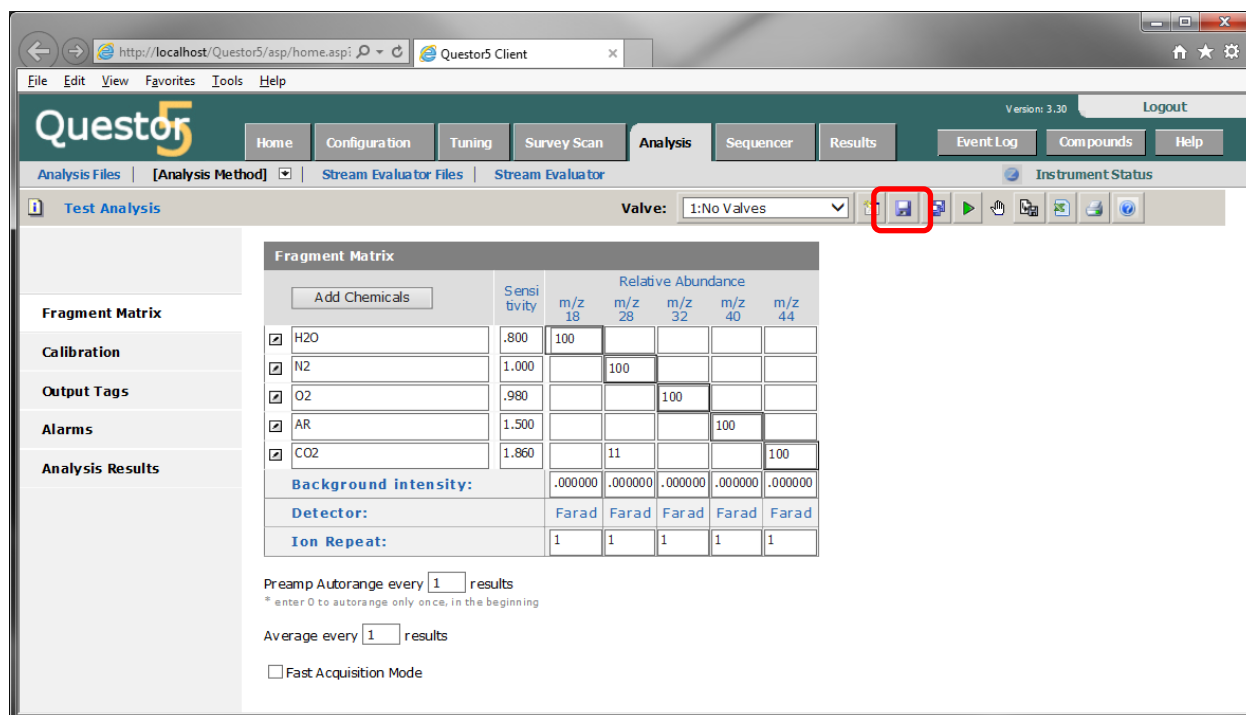
22. If applicable, choose the appropriate valve position from the "Valve" dropdown menu and click the "Start Analysis" button

23. Analysis results will now be displayed in the "Analysis Results" page