AQ2 Protocol

Rev 5: 8/29/2023, SM

Start-up

Turn on instrument with main switch.

Click on the Seal Analytical icon on the desktop.

*For basic access, login as “instrument”, password: iq2hi2nr

*For administrative access, login as CK, password: G01dwater

Allow instrument to warm up for at least 30 min. prior to performing Daily Start-up.

Check Nanopure water container and fill if needed.

Go to **Settings** tab and pull down; select **Daily Start-up**. Click Continue to initiate.

This will flush the cuvette, prime syringe and perform water baselines.

Completed start-up will display the voltages of all 7 filters, if all in range an OK message will be displayed.

Copy/Paste the water baseline data to the excel spreadsheet located on the desktop and add date and initials.

If running Nitrate or Total N, regenerate the cadmium coil by going into the **Maintenance** tab under **Settings** and clicking on the **Copper Coil** icon. Follow the prompts to switch appropriate reagent wedges and click **Continue** when ready. Wait for the instrument to finish its sequence. Once complete, click **Continue** to start a second regeneration. Return reagent wedges to their original placements.

Flush the cuvette by going to **Settings** and choosing **Maintenance**. Click the **Cuvette Functions** icon and ensure the “cuvette cleaning solution” is in reagent spot 1, then click **Extra Wash**.

Scheduling a Tray

Click the **Scheduling** icon to enter scheduler.

The tray selection box will appear. Any tray number not in use will be designated with the word FREE after it. The first FREE tray number will be automatically selected for you. You can use this tray or any of the Free designated trays from 1-99.

Choosing reagent set. If you are running the standard protocols for Ammonia, Nitrate or Phosphate, then choose reagent set #1. (It should be automatically highlighted).

The default tray name is the current date (YY.MM.DD format). Any additional identification for the Tray ID should be added in the tray name selection box.

Adding to the Schedule

Once tray is scheduled the tray screen will be displayed. This screen will be used to build in all of the analysis parameters.

Sample Type: There are three main types to choose from: Standard, Control and Unknown. The types are located in the pull down menu.

Standards: Only scheduled standards should be added to the tray. If Auto- standardize will be used DO NOT enter any standards into the Schedule. If using any of the standard AQ2 protocols for Ammonia, Nitrate or Phosphate auto-standardize should be used.

Controls: These are samples that validate the integrity of the analyzer. These include the blanks and CCV's. If using any of the standard AQ2 protocols for Ammonia, Nitrate or Phosphate the blanks and CCV's have been already been scheduled in these analysis.

Unknowns: These are the samples. (U1, U2 etc.) These can be selected from the pull down menu. Be sure that the CUP number in the sample list corresponds to the sample's position on the sample tray.

The **Auto-fill** icon can be used to fill in samples. Highlight the set of rows corresponding to the number of samples and click the Auto-fill button.

Enter a name for any of unknowns in the **Sample ID** column. (19 characters) More detailed information (47 characters) can be added in the **Sample Details** column.

Adding a Test

Click on the tests short name in the **Available Tests** box, once highlighted it will be added to the list of **Requested Tests** for that sample. Multiple tests can be highlighted and added to a sample.

Adding a **Test Dilution** or **Cup Dilution**

Test Dilution is a dilution that is performed by the **ANALYZER**.

Cup Dilution is one performed by the **USER** before the analysis.

First, the dilution factor to apply must be set. Click on the **Dilution Factor** icon.

In the window that appears select an available dilution factor or specify any other dilution factor by entering it in the **Other Factor** box.

To add a **Test Dilution** to a sample, highlight the sample line to have the dilution applied then click on the test name again in the **Available Tests** box. The test name will turn red and the dilution factor will be appended to the test name in the **Requested Test** box.

To add a **Cup Dilution** to a sample, highlight the sample line the dilution factor will be applied to and then click on the **Cup Dilution icon** on the toolbar. The **Cup Dilution** factor applied will appear next to the Cup number of the selected sample. The result of the sample will be multiplied by this factor and the final result of the manually diluted sample will be displayed.

Inserting a new line

A new line can be inserted into the schedule by clicking the Add a Line button on the Scheduling toolbar. All lines will be moved down to accommodate the new line. A new line cannot be inserted if all tray positions are already assigned a Sample Type or a Test.

ID Generator

The AQ2 software can generate alpha-numeric sample ID's. Click on the ID Generator icon at the top of the screen. Specify the number of samples and what cup to start and end the auto-generation, sample ID and the incremental increase. Click OK to generate the sample ID's on the schedule screen.

Removing or Deleting from the Schedule

This can be done by either:

Highlighting the section of the schedule to be removed/deleted and tap the Delete key on the keyboard or **Delete** icon on the Scheduling toolbar.

Click the **Remove Line** button on the Scheduling toolbar to remove a single line.

Note: if the Remove Line button is used all the lines in the tray will move up one place. IF you want to keep the other lines in place highlight the **entire line** and use the **Delete** key or the toolbar **Delete icon**.

Saving the Schedule

Click on the **Save** icon on the main toolbar and a dialog box will open to confirm the tray has been saved.

Starting a New Schedule

Click on the **New** icon on the main toolbar to create a new schedule. A tray name, number and reagent set will need to be selected.

Open a Saved Schedule

Click on the **Open** icon on the main toolbar. A dialog box will display all of the previously created trays that have not yet been run. Highlight the desired tray ID and click OK.

Running a Tray

Double click on the **Run** icon or if already in the run screen click on the **New** icon and the Tray Selection dialog box will appear.

This dialog box has three columns, the first showing **New and Current Trays**. The other two columns show the **Archived Trays** and the third shows a list of dates.

Highlight the tray to be selected and click OK. The **Options** dialog box will appear. Three selections are available:

Set Tube Counter to Zero	The tube counter should be set to zero **IF** all of the reaction segments have been replaced.
Perform Water baselines	A new set of water baselines will be taken before the run starts.
Auto Standardize	This box **MUST** be ticked in order for the **instrument** to generate a calibration curve automatically.

After selecting options click OK.

If running standard Ammonia, Nitrate or Phosphate protocols the parameters have been pre-set for auto standardization for these analyses.

Common reagent spots are as follows:

1. Cuvette cleaning solution/Buffer for NH4 analysis
2. Phenol for NH4 analysis
3. Bleach for NH4 analysis
4. Nitroprusside for NH4 analysis
5. Buffer for NO3 analysis
6. SAN NEDD color rgt for NO3 analysis
7. Color rgt for PO4 analysis
8. Ascorbic acid for PO4 analysis
9. Cuvette cleaning solution storage spot if 1 is being used
10. High std for Cd column regeneration
11. Cd column regeneration rgt (Cu SO4)
12. PO4 top std
13. CCV (all analyses)
14. NO3/NH4 top std
15. DI water/KCl/TN matrix/TP matrix

Manually Stopping a Tray

At any time during the running of a tray the analyzer can be stopped. To stop a tray, click on the **Stop** icon on the main toolbar. This icon is only available while the tray is running. A dialog box will appear with three options:

Immediate Stop	This option will stop the analyzer as soon as it is safe to do so. This will lose all samples currently incubating and being aspirated. IF the tray is resumed, these samples will be prepared again. **CAUTION: If the probe is in the down position, it will remain in this position. Only use this option if a stop is a high priority. If possible re-initialize before proceeding.**
Orderly Stop	This will take longer to complete but will save currently aspirating results. Incubating samples will be lost. The analyzer will go through a wash cycle before stopping.

Complete Work in Progress	Analyzer will stop sampling but will not stop until all of the currently incubating samples are aspirated. Once all incubating samples have been aspirated, the instrument will go through a wash cycle.

Resuming a tray

This process is the same as Running a Tray. Click either on the **New** icon on the main toolbar or double click on the **Run** icon. Follow the options as though this were a new tray.

Note: When resuming a tray an auto-standardization can be added. This will only affect the samples after the restart. Previous samples can be re-worked under the Data Review.

Data Review

This is where the tray data is accepted and added to the archives or where the tray has new conditions applied for a re-run through the system.

Note: All of the options available on this screen can be undone from this screen.

Accepting an Entire Tray

To accept an entire tray, click on the **Accept All** button on the Acceptance toolbar. This will label all valid test results ACC. If all results are valid the tray will be detected as complete and the prompt to archive the tray will appear.

Once the tray has been accepted, it will be added to the archives. Reports can be created from this point.

A window will pop up with the calibration information. Use the Snipping Tool to highlight and copy the calibration window and then paste it into the corresponding data excel sheet.

Save this sheet as a “Microsoft Excel Workbook” in the AQ2 Out/Data folder.