### Aqualog<sup>®</sup> Software



# **User's Guide for version 3.6**

http://www.HORIBA.com/Scientific



HORIBA Scientific

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Part Number J810013

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### **0: Introduction**



### About Aqualog<sup>®</sup> software

Aqualog<sup>®</sup> software is an easy data-acquisition software ever created by HORIBA Scientific. Spectrofluorometer control is available with only a few mouse-clicks or keystrokes, with a minimum of overlapping screens and windows. Data can be previewed while they are being recorded, and then immediately used with Origin<sup>®</sup> presentation and graphical analysis. Aqualog<sup>®</sup> software runs using Windows<sup>®</sup> 2000 or higher.



*Note:* Keep this and the other reference manuals near the system.

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#### Aqualog Software 3.6 User's Guide rev. B (5 Jun 2012) Symbols used in this manual

Certain symbols are used throughout the text for special conditions when operating the instruments:



General information is given concerning operation of the equipment.

# 1: Aqualog<sup>®</sup> Software Installation

#### Requirements

To successfully install Aqualog<sup>®</sup> software, your host computer needs the following:

#### Software

Windows<sup>®</sup> 2000, Windows<sup>®</sup> XP Pro, Windows<sup>®</sup> 7 (in compatibility mode), or Windows<sup>®</sup> Vista (in compatibility mode)

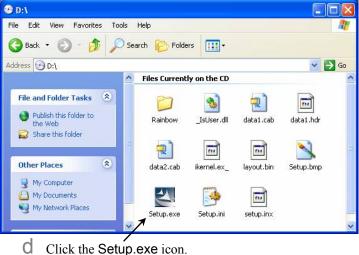
#### Hardware

- Supports Windows<sup>®</sup> 2000, Windows<sup>®</sup> XP Pro, Windows<sup>®</sup> 7 (in compatibility mode), or Windows<sup>®</sup> Vista (in compatibility mode)
- 1 GB RAM
- 1 GB hard-disk space
- One DVD-ROM drive
- One available USB port
- Video resolution of at least 1024 × 768

- 1 Remove any HORIBA USB software key (if inserted) from the host computer before starting the installation.
- 2 Insert the Aqualog<sup>®</sup> DVD in the host computer's DVD drive.
- 3 Open the DVD:
  - a On the desktop, open the My Computer



C Double-click on the DVD drive to open the Aqualog<sup>®</sup> DVD:



#### 4 Install the Aqualog<sup>®</sup> software:

#### The InstallShield<sup>®</sup> Wizard starts.



#### a Click the Next > button. The License Agreement appears.

| HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA<br>HORIDA |   |
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| Make others of any of the MM of ware drout minimum<br>E binbulo, rort, sub isoreo tripiato the HJM SECTIVATE or do   | t by the u≎eral a time.                     |
| E diribulo, iont, sub izoneo zi olazo the HJM ECETWAFE or dz   |   |
|  | mentarion                                   |
|  | e na ana i                                  |
| I group the remain the knetwe agreement  | Birt  |
| I do not accept the terms of the licence acceptert   |   |
|  |   |

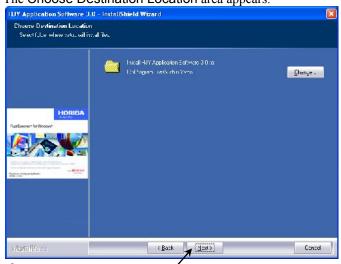
D Click I accept the terms of the license agreement radio button, then the Next > button.

The Customer Information area appears.

| ILIY Application Software 3.                         | .U - InstallShield Wizard   |       |
|--|---|-------|
| Costomer Information<br>Flaase entergrunt formator : |   |       |
| Construction for Windows                             | Place and your name and the name of the company for which you wath.<br>User Name:<br>SC<br>Quir party Name.<br>User You |       |
| solumet Marcia                                       | (Back ユニポン  | Canad |

Enter your User Name and Company Name. The Next > button activates.

#### C Click the Next > button. The Choose Destination Location area appears.



**C** Choose the location where Aqualog<sup>®</sup> is to be installed. Most people prefer the default location. Click the **Change** button to find a different location.

Click the Next > button. The Ready to Install the Program area appears:



- Click the Install button.
- G The computer starts copying the files from the DVD to the hard-drive, and the Setup Status area appears:



Eventually the **Horiba Jobin Yvon USB Installer** window appears:

I



h Click the Next > button. The End User License Agreement area appears:

| Horiba Jobin Y | Yvon USB Installer   |     |
|----------------|--|-----|
| End User Lic   | cense Agreement  |     |
| <b>₩</b>       | To continue, accept the following license agreement. To read the entire<br>agreement, use the scroll bar or press the Page Down key.   |     |
|                | HORIBA Jobin Yvon SOFTWARE LICENSE AGREEMENT<br>IF YOU DO NOT ACCEPT OR AGREE TO THE TERMS OF THE<br>LICENSE AGREEMENT, YOU MAY RETURN THIS SOFTWARE<br>WITH PROOF OF PAYMENT TO JOBIN YVON WITHIN TO DAYS<br>FOR A FULL REFUND OF THE SOFTWARE LICENSE FEE. ALL<br>RETURNED PROGRAMS MUST BE UNUSED AND UNOPENED. |     |
|                | I do not accept this EULA Save As Print  |     |
|                | < Back Next > Cance  |     |
| Click th       | he I accept this EULA radio button, then click   | the |

Click the I accept this EULA radio button, then click the Next > button.

A **Software Installation** warning window may appear:

Software Installation

The software you are installing has not passed Windows Logo
testing to verify its compatibility with Windows XP. (<u>Tell me why
this testing is important.</u>)

Continuing your installation of this software may impair
or destabilize the correct operation of your system
either immediately or in the future. Microsoft strongly
recommends that you stop this installation now and
contact the software vendor for software that has
passed Windows Logo testing.

<u>Continue Anyway</u>

STOP Installation

K Click the Continue Anyway button.

The Installing the software for your HJY USB device... area appears.

| Horiba Jobin Yvon USB Installer   |
|---|
| Installing the software for your HJY USB device                             |
| Please wait while the drivers install. This may take some time to complete. |
| Kancel  |

When complete, the Congratulations! You are finished installing your HJY USB device. area appears:

| Horiba Jobin Yvon USB Ins | taller  |   |
|---------------------------|---|---|
| HORIBA                    | Congratulations! \<br>installing your HJ                      |   |
| -                         | The drivers were successfully                                 | installed on this computer.                               |
| ST.                       | You can now connect your de<br>came with instructions, please | vice to this computer. If your device<br>read them first. |
|                           | Driver Name   | Status  |
| JOBIN YVON                | ✔ Horiba Jobin Yvon Inc. H.                                   | Ready to use  |
|                           | < Back  | Finish Cancel   |

Click the Finish button.

The Horiba Jobin Yvon USB Installer window closes. The InstallShield Wizard Complete area appears.



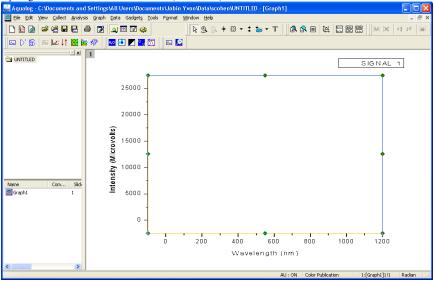
M Click the Finish button. Installation of Aqualog<sup>®</sup> software is complete.

- Plug in all HORIBA software keys. Remove the Aqualog<sup>®</sup> DVD from the host computer.
- 5 Start Aqualog<sup>®</sup> software.
  - On the desktop, double-click the Aqualog V3.6 icon.
     The Aqualog window appears:



15

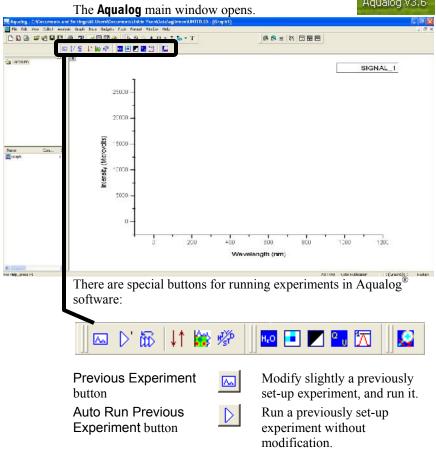




# 2: Quick Guide to Running a Scan

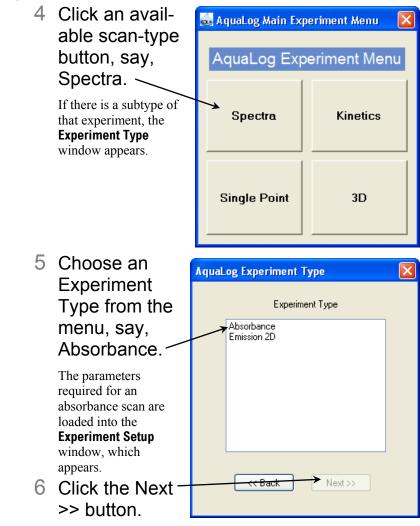
- 1 Turn on the host computer, the Aqualog<sup>®</sup> instrument, and all accessories, as explained in their respective instruction manuals.
- 2 Click on the Aqualog short-cut to start Aqualog<sup>®</sup> software.

Aqualog V3.6



| Aqualog Softwa | re 3.6 User's Guide rev. B (5 Jun 201<br>Run JY Batch<br>Experiments button  | 2)                   | Run an automated series of<br>experiments, including<br>adjustable repeats and delays<br>between experiments.                                   |
|----------------|--|----------------------|---|
|                | Rescale Y button   | $\downarrow\uparrow$ | Rescale the <i>y</i> -axis on an open graph to fit the data on-scale.   |
|                | Profile Tool button  |                      | Provide a user-specified two-<br>dimensional profile of an<br>excitation-emission matrix. The<br>active file must be such a data<br>matrix.     |
|                | Switch menu<br>between HJY<br>Software Application<br>and Origin Std. button | **                   | Switch the menus at the top of<br>the <b>Aqualog</b> main window<br>between Aqualog <sup>®</sup> software<br>and Origin <sup>®</sup> functions. |
|                | Experiment Menu<br>button  | H <sub>e</sub> O     | Choose an overall type of<br>experiment to run, such as<br>general Spectra, Kinetics, 3D,<br>or Single Point.                                   |
|                | Aqualog IFE button   |                      | Remove artifacts pertaining to the inner-filter effect from the data.   |
|                | Rayleigh Masking   |                      | Mask Rayleigh scattering lines that appear in the data.   |
|                | Quinine Sulfate Units button   | Q U                  | Provide a standardized intensity<br>for fluorescence measurements<br>and EEMs.  |
|                | Normalize button   |                      | Automatically normalize the active data to intensities between 0 and 1.   |
|                | 3D Zoom button   |                      | Change the <i>x</i> - <i>y</i> - <i>z</i> axes in a three-dimensional waterfall plot.   |
| 3              | Click the Experim  | ent N                | lenu button 🛄.  |

The Aqualog Main Experiment Menu appears:



The Experiment Setup window opens:

| File: 🔂 Load   | Data Description<br>Data Identifier:                   |
|--|--|
| DfltAqualogSpectralAbsorbance.xml                                  | DfAqSpAbs  |
| Directory:   | Comment:   |
| C:\Documents and Set ngs\All Users\Document                        | As Spectral Acquisition[Absorbance]                    |
| quaLog Experiment Optio s  |  |
| - Integration Time   | Blank / Sample Setup                                   |
| Integration (s)  | O Blank Only   |
| 0.1  | Sample and Blank                                       |
|  | Collect Blank  |
|  | O Blank from File                                      |
|  | Sample Only  |
| - Wavelength Settings  | Sample Selection                                       |
| Excitation High (n ) Low (nm) Increment (n<br>Wavelength 550 230 5 | m) Blank: Position 1 🔽 Sample: Position 2 💌            |
|  | Accessories  |
|  | Enable Temp. Setpoint (°C) Tolerance (°C) Equil. (min) |
|  |  |
|  | Enable External Sensor                                 |
|  |  |

- 7 Click the File field, and enter a new file name, or select a previously saved file with the Load button.
- 8 Verify that the experimental parameters are correct.
- 9 Insert the sample(s) into the sample compartment, and close the sample compartment's lid.
- 10Click the Run button



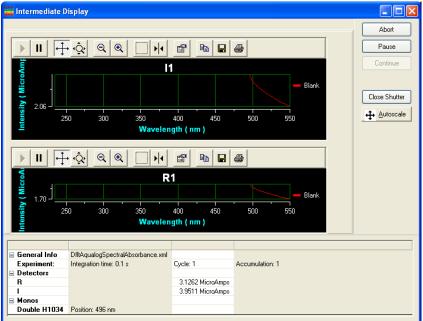


- If you do not have an automatic samplechanger, a prompt appears to insert the blank or sample.
- 11 Click the OK button when you have inserted the blank or sample and closed the cover.



*Note:* If the scan is extremely fast, the *Intermediate Display* may be only incompletely or rapidly displayed before the *Origin* window appears.

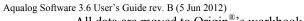
The collected spectrum is displayed on the **Intermediate Display** screen:

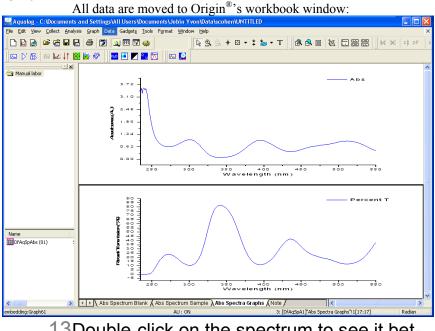


You can watch the incoming data in real time, along with how the positions of accessories vary. The scan may be paused, continued, or aborted. After all data are recorded, the **Intermediate Display** vanishes. For a new project, the **Project name** window appears:

| Project name                |        |        |
|-----------------------------|--------|--------|
| Please enter a project name |        |        |
| 1                           |        | Browse |
| ОК                          | Cancel |        |

12Enter a name for the entire project, or browse for an existing project name with the Browse button, then click the OK button.





13Double-click on the spectrum to see it better in a separate window for editing.
14Do post-processing as needed, using the Aqualog IFE button , Rayleigh Masking button , and Normalization button .

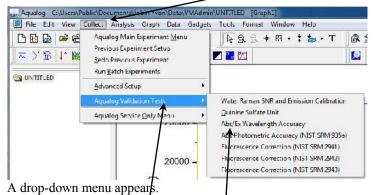
# 3: Aqualog<sup>®</sup> Software Tips & Tricks

Validating the calibration of your instrument

# Absorbance/excitation wavelength accuracy validation

This validation check examines the accuracy of the wavelengths scanned using the xenon lamp and absorbance detector, using the Starna RM sample.

- 1 Start the Aqualog<sup>®</sup> software.
- 2 In the **Aqualog** main window, choose Collect.



3 Choose Aqualog Validation Tests.

Another drop-down menu appears.

4 Choose Abs/Ex Wavelength Accuracy.



*Note:* The Quinine Sulfate standard kit, RM-06HLKI-R, is available from Starna Cells, Inc., 5950 Traffic Way, Atascadero, CA 93422; phone: 800-228-4482; 805-466-8855; website is www.starnacells.com

If the instrument has not initialized, initialization occurs. The validation experiment automatically loads with some of the fields graved out:

| gruyed out.  |   |
|--|---|
| AquaLog Experiment Setup ([Absorbance])  |   |
| Experiment File: DftR-qualogSpectralAbsorbance.xml Directory: C:\Documents and Settings\All Users\Document Save As   | Data Description         Data Identifier:         KDABSAcc         Comment:         Starna SRM Potassium Dichromate Absorbance Accuracy                 |
| quaLog Experiment Options Integration Time Integration (s) 0.3   | Blank / Sample Setup<br>Blank Only<br>Sample and Blank  |
| Wavelength Settings<br>Excitation High (nm) Low (nm) Increment (nm)<br>Wavelength 400 230 0.5  | Collect Blank Blank from File Sample Collect Sample Selection Position 1 Position 2  Accessories Enable Temp. Setpoint ("C) Tolerance ("C) Equil. (min) |
|  | Controller 0 0 0<br>Enable External Sensor<br>Enable External Trigger   |
| 5 Click the Run but  | ton Bun   |
| A message telling you to in<br>appears:<br>6 Insert the K <sub>2</sub> Cr <sub>2</sub> O<br>with the frosted s<br>ward the front of<br>strument, and the<br>sides toward the | P7 blank<br>ide to-<br>the in-<br>e clear   |

and right of the instru-

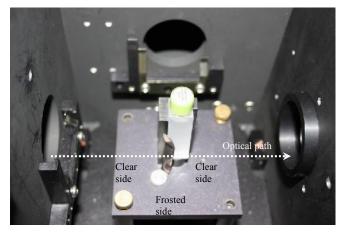
This allows a clear optical path.

ment.

Frosted

side

Clear side



7 Close the sample-compartment lid, and click the OK button.

The **Experiment Status** window opens. The validation scan runs. A message telling you to insert the blank appears.



8 Insert the holmium sample with the

frosted side toward the front of the instrument, and the clear sides toward the left and right of the instrument.

9 Close the sample-compartment lid, and click the OK button.

The Project name window appears:

| 🚟 Project name              |        |
|-----------------------------|--------|
| Please enter a project name |        |
|                             | Browse |
| OK Cancel                   |        |
| k the Cancel button         |        |

Click the Cancel button.

Aqualog Software 3.6 User's Guide rev. B (5 Jun 2012) A table of the validation test appears. In the B(Y2) column, there should be all P's (passes).

| Pie Edk Few Collect Andys                 | is Phil. Dahara | Marialers, Salislas    | Sange Task Period  | Nindon Hoj. |        |           |                    |               | - 17 |
|---|-----------------|------------------------|--------------------|-------------|--------|-----------|--------------------|---------------|------|
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|   | 19              |                        | u 🗉 🗖 🖬 🖬          |             | 1      | _         |                    |               |      |
| project1-7122011                          |                 | po(<1) 💩               | (17)yoc            | C13(2)      | A 21   | B(YZ) 🐁   |                    |               | -    |
| projector to all                          | Long Name       | Poak Contoro ef "Abo"  | Y V Centers of Abs | cente3+alue | •2 678 | PossiFail |                    |               |      |
|   | Scholen E       | 333.8                  | 0.06298            | 333.47      | 1      | -         |                    |               |      |
|   | 3               | 315 8                  | 0.00243            | 345.58      | 1      |           |                    |               |      |
|   | 1               | 351.2                  | 0.22742            | 261.13      | 1      | 21        |                    |               |      |
|   | 4               | 336.3                  | 0.36498            | 386.44      | 1      | -         |                    |               |      |
|   | 5               | 417.3                  | 0.29230            | 4. 7 32     | 1      |           |                    |               |      |
|   | E               | 451.2                  | 0.58843            | 451.4       | 1      | 50 - C    |                    |               |      |
|   | 7               |                        |                    |             |        |           |                    |               |      |
|   | E               |                        |                    |             |        |           |                    |               |      |
|   | Ŀ               |                        |                    |             |        |           |                    |               |      |
|   | 10              |                        |                    |             |        |           |                    |               |      |
|   | 11              |                        |                    |             |        |           |                    |               |      |
|   | 12              |                        |                    |             |        |           |                    |               |      |
| ne Con Sic                                | 12              |                        |                    |             |        | -         |                    |               |      |
| 004-AGC (01)                              | 14              |                        |                    |             |        |           |                    |               |      |
|   | 16              |                        |                    |             |        |           |                    |               |      |
|   | 10              |                        |                    |             |        |           |                    |               |      |
|   | 18              |                        |                    |             |        |           |                    |               |      |
|   | 10              |                        |                    |             |        |           |                    |               |      |
|   | A               |                        |                    |             |        |           |                    |               |      |
|   | 21              |                        |                    |             |        |           |                    |               |      |
|   | 2               |                        |                    |             |        |           |                    |               |      |
|   | 22              |                        |                    |             |        |           |                    |               |      |
|   | 24              |                        |                    |             |        |           |                    |               |      |
|   | đ               |                        |                    |             |        |           | 3                  |               |      |
|   | 25              |                        |                    |             |        |           |                    |               |      |
|   | 27              |                        |                    |             |        |           |                    |               |      |
|   | 26              |                        |                    |             |        |           |                    |               |      |
|   | 39              |                        |                    |             |        |           |                    |               |      |
|   | ×               |                        |                    |             |        |           |                    |               |      |
|   | л               |                        |                    |             |        |           |                    |               |      |
|   |                 | ooktrum Blank 🕺 Also B |                    |             |        |           | cta Pozili Conters |               |      |

### 11 If the test shows all "Pass" values, continue to the next test.

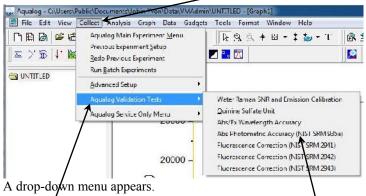
If there are failures, please call the HORIBA Scientific Service Department.

#### Absorption-accuracy validation

This validation check examines the accuracy of the absorption function of the Aqualog<sup>®</sup>. Use the absorption standard SRM 935a available from NIST.

**Note:** The absorbance calibration standard kit, RM-06HLKI-R, is available from Starna Cells, Inc., 5950 Traffic Way, Atascadero, CA 93422; phone: 800-228-4482; 805-466-8855; website is www.starnacells.com

# 1 In the **Aqualog** main window, choose Collect.



2 Choose Aqualog Validation Tests.

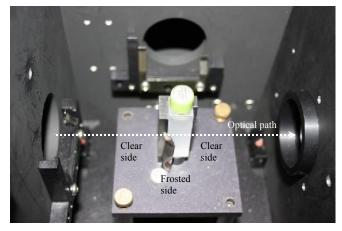
Another drop-down menu appears.

3 Choose Abs Photometric Accuracy (NIST SRM 935a).

The validation experiment automatically loads with some of the fields grayed out:

| AquaLog Experiment Setup ( [Absorbance] )   |   |
|---|---|
| Experiment       File:       DflAqualogSpectralAbsorbance: xml       Directory:       C:\Documents and Settings\All Users\Document  | Data Description Data Identifier: KDABSAcc Comment: Stama SRM Potassium Dichromate Absorbance Accuracy  |
| quaLog Experiment Options Integration Time Integration (s) 0.3  | Blank / Sample Setup Blank Only Sample and Blank Collect Blank Blank from File Sample Only Concel calculation   |
| Wavelength Settings Excitation High (nm) Low (nm) Increment (nm) Wavelength 400 230 0.5   | Sample Selection       Position 1       Position 2       Accessories       Enable Temp.       0 |
|   | Help RIC Bun Cancel   |
| 4 Click the Run but   |   |
| A message telling you to in<br>appears:<br>5 Insert the K <sub>2</sub> Cr <sub>2</sub> O<br>with the frosted s<br>ward the front of | D <sub>7</sub> blank<br>ide to-   |
|   | e clear sides toward the  |
| This allows a clear optical   | path.   |





# 6 Close the sample-compartment lid, and click the OK button. Experiment Status

#### The Experiment Status

window opens. The validation scan runs. A message telling you to insert the sample appears.



7 Insert the potassi-

um dichromate (60 mg  $L^{-1}$ ) sample with the frosted side toward the front of the instrument, and the clear sides toward the left and right of the instrument.

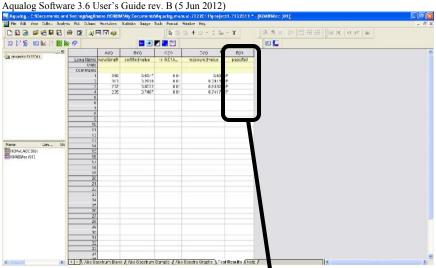
8 Close the sample-compartment lid, and click the OK button.

The **Project name** window appears:

| 🚟 Project name              | X      |
|-----------------------------|--------|
| Please enter a project name |        |
|                             | Browse |
| OK Cancel                   |        |

9 Click the Cancel button.

A table of the validation test appears. In the E(Y) column, there should be all P's (passes).



## 10If the test shows all "Pass" values, continue to the next test.

If there are failures, please call the HORIBA Scientific Service Department.

# Water-Raman-peak signal-to-noise and emission calibration validation

This validation check examines the wavelength calibration of the CCD detector. It is an emission scan of the Raman-scatter band of water performed in right-angle mode.



*Note:* Avoid glass or acrylic cuvettes: they may exhibit UV fluorescence or filtering effects.

The water sample should be research-quality, triple-distilled or deionized water. HPLC-grade (18-M $\Omega$  spec.) or equivalent water is suggested for the Raman scan. HORIBA Scientific recommends the Starna sealed water-Raman sample. Impure samples of water will cause elevated background levels as well as distorted spectra with (perhaps) some unwelcome peaks. Use a 4-mL quartz cuvette.



*Note:* The water Raman sample is available from Starna Cells, Inc., 5950 Traffic Way, Atascadero, CA 93422; phone: 800-228-4482; 805-466-8855; website is www.starnacells.com

1 Insert the water sample into the sample compartment.

With an automated sample changer, note the position number in which the sample cell is placed.

- 2 Close the lid of the sample chamber.
- 3 In the Aqualog main window, choose Collect.

| 🗐 File Edit View 🖸  | Collect Analysis Graph Data Gadge  | ts Tools Format Window Help                        |    |
|---------------------|--|--|----|
| <u> </u>            | Aqualog Main Experiment Menu   | 📔 🖹 🔍 🕂 🛛 🕂 🎽 🗸 T                                  | R  |
| ≂>'50 ↓ <b>`</b> 16 | Previous Experiment Setup<br>Redo Previous Experiment<br>Run Batch Experiments |  |    |
|                     | Advanced Setup   | -  |    |
|                     | Aqualog Validation Tests   | Water Raman GNR and Emission Calibratio            | n  |
|                     | Aqualog Service Only Menu  | Quinine Sulfate Unit<br>Abs/Ex Wavelength Accuracy |    |
|                     | (3093353)  | Abs Photometric Accuracy (NIST SRM 935)            | a) |
|                     |  | Fluorescence Correction (NIST SRM 2941)            |    |
|                     | 20000 -  | Fluerescence Correction (NIST SRM 2042)            |    |
|                     |  | Fluorescence Correction (NIST SRM 2943)            |    |

A drop-down menu appears.

#### 4 Choose Aqualog Validation Tests.

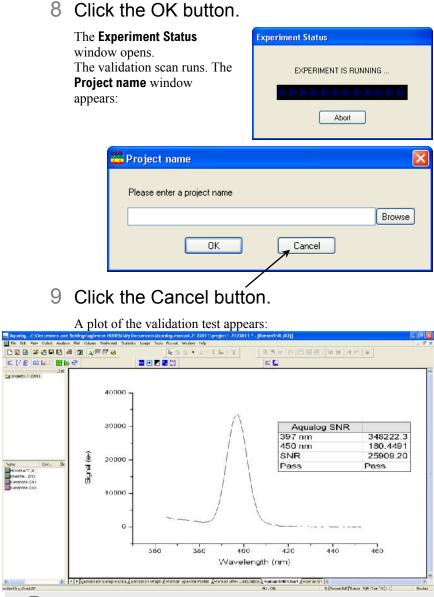
Another drop-down menu appears.

# 5 Choose Water Raman SNR and Emission Calibration.

The validation experiment automatically loads with some of the fields grayed out:

| AquaLog Experiment Setup ([Emission 2D])   |  |
|--|--|
| Experiment       File:       DrthAqualogSpectralEmissionTwoD.xml       Directory:       C:\Documents and Settings\All Users\Document   | Data Description<br>Data Identifier:<br>RamanSNR<br>Comment:<br>Water Raman SNR Test: Starna RM 3-Q-10 Water   |
| AquaLog Experiment Options   |  |
| Integration Time       Integration (s)       30       Accumulations       1     Total Integration = 0.1 (s)  | Blank / Sample Setup<br>Blank Only<br>Sample and Blank<br>Collect Blank<br>Blank from File<br>Sample Only  |
| Wavelength Settings         Excitation       Park (nm)         Wavelength       350         Emission       Low (nm)       High (nm)       Increment (nm)         Coverage       210.07       619.62       0.82 nm (2 pixel)       ✓         Advanced | Sample Selection Position 1 Position 1 Accessories Canable Temp. Dentroller D |
|  | Image: Burger State     Image: Burger State     Image: Burger State     Cancel   |
| 6 Place the Starna<br>ter sample in the<br>cial sample hold<br>and mount the san<br>holder in the san<br>compartment. C<br>the sample-<br>compartment lid  | e spe-<br>ler,<br>sample<br>mple<br>close  |
| 7 Click the Run bu   |  |

A message telling you to insert the sample appears.



1

**Note:** Observed throughput (and hence peak intensity) is affected by lamp age and alignment, slit settings, and sample purity. As the xenon lamp ages, the throughput of the system will decline slowly. Therefore, low water-Raman peak intensity may indicate a need to replace the xenon lamp.

# 10If the test shows a "Pass" value, continue to the next test.

If the plot displays "fail", please call the HORIBA Scientific Service Department.

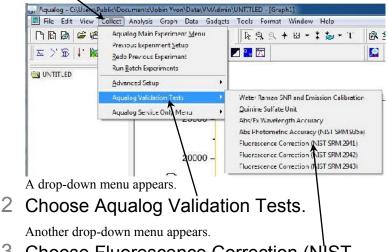
# Fluorescence correction validation with NIST SRM 2941 sample

This validation check examines the accuracy of the fluorescence correction file of the Aqualog<sup>®</sup>. Use the fluorescence standards (SRM 2941, SRM 2942, and SRM 2943) available from NIST.



*Note:* Fluorescence standards (SRM 2941, SRM 2942, and SRM 2943) are available from National Institute for Standards and Technology (NIST), phone: 301-975-2200; website is www.nist.gov

1 In the **Aqualog** main window, choose Collect.

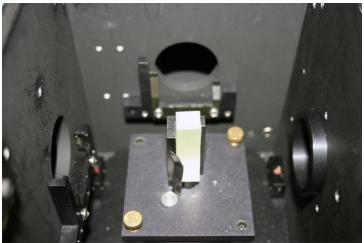


3 Choose Fluorescence Correction (NIST SRM 2941).

The validation experiment automatically loads with some of the fields grayed out:

| xperiment   | Data Description   |
|---|--|
| File:   | Data Identifier:   |
| DfltAqualogSpectralEmissionTwoD.xml Directory: Save | SRM2941<br>Comment:                                      |
| C:\Documents and Settings\All Users\Document        | NIST SRM2941 Validation Test for Emission Spectral       |
| uaLog Experiment Options                            |  |
| -Integration Time                                   | Blank / Sample Setup                                     |
| Integration (s)                                     | 🔿 Blank Only   |
| 0.15  | Sample and Blank   |
|   | Collect Blank  |
| Accumulations                                       | O Blank from File  |
| 1 Total Integration = 0.1 (s)                       | Sample Only  |
| Wavelength Settings                                 | Sample Selection   |
| Excitation Park (nm)                                | Position 1 💉   |
| Wavelength 427                                      |  |
| Emission Low (nm) High (nm) Increment (nm)          | Accessories<br>Setpoint (*C) Tolerance (*C) Equil. (min) |
| Coverage 210.07 619.62 0.82 nm (2 pixel)            | Controller   |
|   | Enable External Sensor                                   |
| Advanced  | Enable External Sensor                                   |
|   |  |

4 Insert the 2941 standard with the frosted side toward the front of the instrument (for fluorescence), and the clear sides toward the left and right of the instrument. Close the sample-compartment lid.

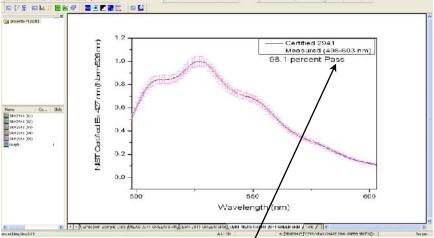




### 5 Click the Run button

A message telling you to insert the blank appears.

| 6                          | Click the OK button.  | Experiment Status             |  |  |
|----------------------------|---|-------------------------------|--|--|
|                            | The <b>Experiment Status</b><br>window opens.<br>The validation scan runs. The<br><b>Project name</b> window appears: | EXPERIMENT IS RUNNING         |  |  |
|                            | 🚟 Project name  |                               |  |  |
|                            | Please enter a project name   | Browse                        |  |  |
|                            | ОК  | Cancel                        |  |  |
| 7 Click the Cancel button. |   |                               |  |  |
| P AP-                      | A plot of the validation test appea   |                               |  |  |
| k Few Culler, Andysh       | . Pil Chan Verbiez Satistic bage Tak Penat Nieler He.<br>B (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)                    | - ● X 451 (5).<br>● 第 第 回 田 田 |  |  |



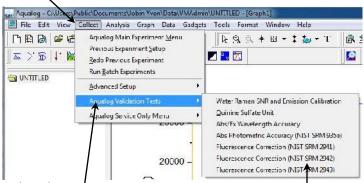
# 8 If the test shows a "Pass" value, continue to the next test.

If the plot displays "fail", please call the HORIBA Scientific Service Department.

# Fluorescence correction validation with NIST SRM 2942 sample

This validation check examines the accuracy of the fluorescence correction file of the Aqualog<sup> $\mathbb{R}$ </sup>.

1 In the Aqualog main window, choose Collect.



A drop-down menu appears.

### 2 Choose Aqualog Validation Tests.

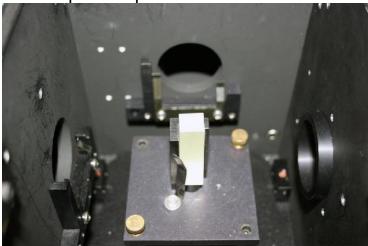
Another drop-down menu appears.

3 Choose Fluorescence Correction (NIST SRM 2942).

The validation experiment automatically loads with some of the fields grayed out:

| xperiment  | Data Description   |
|--|--|
| File: 💼 Load   | Data Identifier:   |
| DfltAqualogSpectralEmissionTwoD.xml  | SRM2942  |
| Directory:   | Comment:   |
| C:\Documents and Settings\All Users\Document Save As                                   | NIST SRM2942 Validation Test for Emission Spectral       |
| quaLog Experiment Options  |  |
| Integration Time   | Blank / Sample Setup                                     |
| Integration (s)  | O Blank Only   |
| 0.1  | <ul> <li>Sample and Blank</li> </ul>                     |
|  | <ul> <li>Collect Blank</li> </ul>                        |
| Accumulations  | O Blank from File  |
| 1 Total Integration = 0.1 (s)  | Sample Only  |
| Wavelength Settings  | Sample Selection   |
| Excitation Park (nm)   | Position 1 🗸   |
| Wavelength 310   |  |
| Emission Low (nm) High (nm) Increment (nm)   | Accessories<br>Setpoint (*C) Tolerance (*C) Equil. (min) |
| Emission Low (nm) High (nm) Increment (nm)<br>Coverage 210.07 619.62 0.82 nm (2 pixel) | Enable Temp. Septimin (C) Foreiance (C) Equilit (mini)   |
|  |  |
| Advanced   | Enable External Sensor                                   |
|  | Enable External Trigger                                  |

4 Insert the 2942 standard with the frosted side toward the front of the instrument (for fluorescence), and the clear sides toward the left and right of the instrument. Close the sample-compartment lid.





### 5 Click the Run button

A message telling you to insert the blank appears.

### 6 Click the OK button.

The **Experiment Status** window opens.

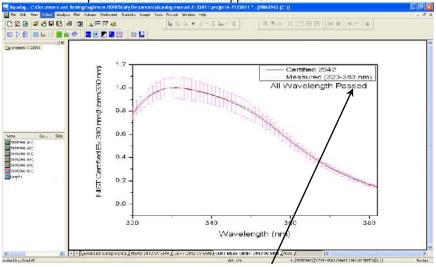
The validation scan runs. The **Project name** window appears:

| Experiment Status     |
|-----------------------|
|                       |
| EXPERIMENT IS RUNNING |
|                       |
| Abort                 |

| Project name                | X      |
|-----------------------------|--------|
| Please enter a project name |        |
|                             | Browse |
| OK Cancel                   |        |

### 7 Click the Cancel button.

A plot of the validation test appears:



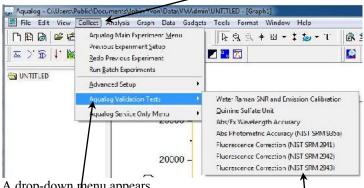
### 8 If the test shows a "Passed" value, continue to the next test.

If the plot displays "fail", please call the HORIBA Scientific Service Department.

### Fluorescence correction validation with NIST SRM 2943 sample

This validation check examines the accuracy of the fluorescence correction file of the Aqualog<sup>®</sup>.

1 In the Aqualog main window, choose Collect.



A drop-down menu appears.

### 2 Choose Aqualog Validation Tests.

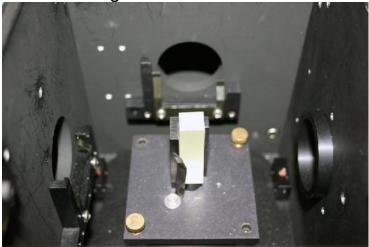
Another drop-down menu appears.

3 Choose Fluorescence Correction (NIST) SRM 2943).

The validation experiment automatically loads with some of the fields grayed out:

| xperiment                                    | Data Description                                       |
|--|--|
| File: 💼 Load                                 | Data Identifier:                                       |
| DfltAqualogSpectralEmissionTwoD.xml          | SRM2943  |
| Directory:                                   | Comment:   |
| C:\Documents and Settings\All Users\Document | NIST SRM2943 Validation Test for Emission Spectral     |
| quaLog Experiment Options                    |  |
| - Integration Time                           | Blank / Sample Setup                                   |
| Integration (s)                              | O Blank Only   |
| 0.1  | Sample and Blank                                       |
| Accumulations                                | <ul> <li>Collect Blank</li> </ul>                      |
|  | O Blank from File                                      |
| 1 Total Integration = 0.1 (s)                | Sample Only  |
| - Wavelength Settings                        | Sample Selection                                       |
| Excitation Park (nm)                         | Position 1 👻   |
| Wavelength 330                               | Accessories  |
| Emission Low (nm) High (nm) Increment (nm)   | Enable Temp. Setpoint (°C) Tolerance (°C) Equil. (min) |
| Coverage 210.07 619.62 0.82 nm (2 pixel) 🗸   | Controller 0 0   |
| Advanced                                     | Enable External Sensor                                 |
| Hardhood                                     | Enable External Trigger                                |
|  |  |
|  |  |

4 Insert the 2943 standard with the frosted side toward the front of the instrument (for fluorescence), and the clear sides toward the left and right of the instrument.





5 Click the Run button

A message telling you to insert the blank appears.

6 Close the samplecompartment lid, and click the OK button.

| Experiment Status     |
|-----------------------|
|                       |
| EXPERIMENT IS RUNNING |
|                       |
| Abort                 |

#### The Experiment Status

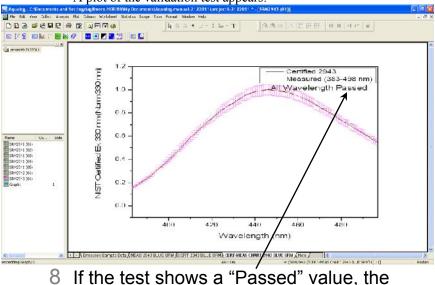
window opens.

The validation scan runs. The Project name window appears:

| E Project name              | Σ        |
|-----------------------------|----------|
| Please enter a project name |          |
|                             | Browse   |
| ОК                          | 🛪 Cancel |
| /                           |          |

### 7 Click the Cancel button.

A plot of the validation test appears:



Aqualog<sup>®</sup> is calibrated properly.

If the plot displays "fail", please call the HORIBA Scientific Service Department. Aqualog Software 3.6 User's Guide rev. B (5 Jun 2012) Corrected signals



*Note:* All dark-offset,  $X_{correct}$ ,  $M_{correct}$ ,  $I_c/R_c$ , and  $S_c/R_c$  corrections (see below for definitions) are automatically done in Aqualog<sup>®</sup> software. Inner-filter effects, Rayleigh-masking, and normalizations are user-activated.

### Introduction to EEMs for CDOM

Given the complex multitude of CDOM components in many bodies of water, a rapid method for qualitative and quantitative determinations has obvious value to the water-quality research and analysis community. The most conventional method of analyzing CDOM using fluorescence is the excitation-emission map (EEM). EEMs are recorded by scanning the excitation spectrum (or absorbance) of the fluorescent sample's components at the same time as the fluorescence-emission spectrum is recorded, for each excitation wavelength. This results in a "three-dimensional" intensity map of the sample's fluorescence, showing both the emission and absorbance spectra of all fluorescent components in the measured wavelength region. The EEM, however, does not contain the absorbance spectral information of non-fluorescent components in the sample. Moreover, the EEM spectral information can be distorted by inner-filter effects associated with absorbance of the excitation beam and fluorescence. So it follows that ideally the EEM should be measured *along with* the absorbance spectrum of the sample to ease inner-filter effect correction and monitoring bleaching of the sample, as well as to provide information about non-fluorescent compounds absorbing light in the sample.

# Spectral correction: Wavelength-dependent detector response

Because most CDOM studies rely on comparison to traceable spectral and concentration standard samples, the spectral-correction of the EEM is of prime concern. A typical EEM scans the sample across the excitation wavelengths from about 240–500 nm, and across the emission wavelengths from 250–600 nm. Bandpass and resolution are typically (and fixed in the Aqualog<sup>®</sup> to) 5 nm. To account for variations in the excitation beam's intensity, a reference detector, *R*, collects a small fraction of the excitation beam, and the emission detector's output, *S*, is ratioed to the reference detector signal (*S*/*R*).

However, the instrument's optical responsivity is not ideal throughout the wavelength-range of the experiment, so a series of instrumental spectral correction-factors must be used to obtain reproducible ideal spectra that are traceable to established, calibrated spectral standard samples, detectors, and light sources.

- Dark-current signals must be subtracted, respectively, from both the *S* and *R* detector signals.
- The *S* and *R* detectors' signals must also be respectively multiplied by the excitation  $(X_{correct})$  and emission  $(M_{correct})$  spectral correction factors.

It follows that the final signal plotted as a function of wavelength in an EEM involves both the corrected reference signal,  $R_c$ ,

$$R_c = (R - \text{dark}) \cdot X_{\text{correct}}$$

and the corrected emission-detector signal,  $S_c$ ,

$$S_c = (S - \text{dark}) \cdot M_{\text{correct}}$$

The final fluorescence signal recorded is thus  $S_c/R_c$  for both the sample to be evaluated and for a representative reference or blank sample as discussed below.

Simultaneous to the EEM, the sample's spectral transmittance and absorbance properties can be recorded with the Aqualog<sup>®</sup>. From the Beer-Lambert law, absorbance de-fined as  $Abs = \varepsilon cl$ , where  $\varepsilon$  is the extinction coefficient, c is the concentration and l is the pathlength of the sample cell. Within the Aqualog<sup>®</sup>, the transmission detector signal,  $A_c = A - \text{dark signal}$ , is used to calculate the *Abs* and transmittance (*T*) values. The transmission detector's signal,  $A_{c}$ , is also corrected for the excitation-source intensity measured using the reference detector signal  $(R_c)$ formulated above as  $A_c/R_c = I_0$  from a representative blank or reference sample and  $I = A_c/R_c$  from the sample to be evaluated as per below. For CDOM measurements, the blank or reference sample is usually highly purified water, with resistance  $\geq 18.2 \text{ M}\Omega$ and total organic carbon < 2 ppb. The transmission, percent transmission and absorbance values Abs<sub>i</sub> at a given wavelength  $\lambda$ are calculated as follows:

$$T_{\lambda} = \left(\frac{I}{I_{0}}\right)$$
  
% $T_{\lambda} = 100 \times \left(\frac{I}{I_{0}}\right)$   
Abs =  $-\log(T)$ 

### EEM spectral correction: blank-subtraction, Rayleigh-masking and Raman scattering

The current practice for EEMs involves measuring the excitation and emission scan-ranges, which includes their overlap regions. These overlap regions manifest in intense signals from the scattered photons from the monochromatic excitation source in the emission detector's response. These lines are caused by both the first- (and second-) order Rayleigh-scattering features consistent with the well-known grating equation. Additionally another spectral feature, associated water samples, is the water Raman scattering line. The Raman scattering line is related to the Rayleigh scattering line by a constant energy shift of 3382 cm<sup>-1</sup>. Most CDOM component libraries contain spectra for which the artifactual Rayleigh and water-Raman spectral features have been removed, and hence EEM data is usually processed to remove both the Rayleigh and Raman scattering features systematically. The Aqualog<sup>®</sup> software package can remove both artifacts. Subtraction of the blank EEM from the sample EEM effectively removes the Raman scatter line. Applying a Rayleigh-masking algorithm based on the excitation and emission spectral bandwith nullifies the signal intensities for both the first- and second-order Rayleigh lines.

# EEM spectral correction: primary and secondary inner-filter effects

Common, recommended practice is to correct the EEM data for inner-filter effects (IFE) using the parallel absorbance measurements from the sample and blank as mentioned above. One obvious criterion for accurate IFE is the requirement for the concentration of the sample to fall within the linear Beer-Lambert region for the absorbance spectral region associated with the EEM. The IFE algorithms used in Aqualog<sup>®</sup> involve measuring the absorbance spectrum of the sample for the overlapping range of both the excitation and emission spectra to correct for both the primary and secondary IFEs. The basic IFE algorithm employed in the Aqualog<sup>®</sup> software requires use of conventional  $1 \times 1$  cm pathlength cuvettes. The equation below is applied to each excitationemission wavelength coordinate of the EEM:

$$F_{\rm ideal} = F_{\rm obs}^{10\frac{Abs_{\rm Ex}+Abs_{\rm Em}}{2}}$$

where  $F_{ideal}$  is the ideal fluorescence-signal spectrum expected in the absence of IFE,  $F_{obs}$  is the observed fluorescence signal, and  $Abs_{Ex}$  and  $Abs_{Em}$  are the measured absorbance values at the respective excitation and emission wavelength-coordinates. A number of advanced algorithms described in the literature can also account for variations of the optical geometrical parameters of the cuvette path-length, beam- or slit-width, and positioning or shifting of the cuvette relative to the excitation and emission beam paths. However, the fixed optical geometry of the Aqualog<sup>®</sup> lends itself to the simple solution above because neither the slit-widths that determine the beam geometry, nor the pathlengths or overlap volume of the absorbance and emission paths are user-adjustable. Moreover, IFE corrections are generally only important when the absorbance values exceed 0.05 in a 1 cm path-length, so there is generally little information to be gained in the EEM from either an extended or shortened path-length cell. The fixed geometry of the Aqualog<sup>®</sup> further lends the use of the instrument to support valid intra- and inter-laboratory comparisons by eliminating variances in the chief parameters of absorbance and emission pathlength. The fixed optical geometry also makes accurate and reproducible spectral correction easy as well as easy validation of such with standard traceable samples.

### EEM spectral correction: intensity standardization to quinine-sulfate-unit equivalents and water-Raman scattering intensity

Whereas the absorbance spectral response of the Aqualog<sup>®</sup> with respect to sample concentration is generally invariant over the lifetime of the instrument, the fluorescence-detection path is subject to changes in the excitation source's intensity and detector response that should be routinely monitored with standard samples and experimental conditions. Moreover, to ease comparison with other instruments and studies, such standardization is conventional and recommended practice. Most commonly the throughput response of a fluorometer including the Aqualog<sup>®</sup> is measured by evaluating the water-Raman scattering intensity under standard conditions of 350 nm excitation and 397 nm emission at 5 nm bandpass for a fixed time interval. Likewise, many CDOM studies calibrate the instrument's throughput and CDOM concentration relative to a quinine-sulfate-unit equivalent (OSU), based on the excitation at 347.5 nm of 1 ppm of OSU dissolved in 0.1 mol of perchloric acid, and the instrument measuring the emission intensity at 450 nm. The Aqualog<sup>®</sup> contains a built-in tool for calculating and applying both the water-Raman and QSU standardization and normalization

### EEM spectral correction: nonlinear leastsquares and multivariate spectral analyses

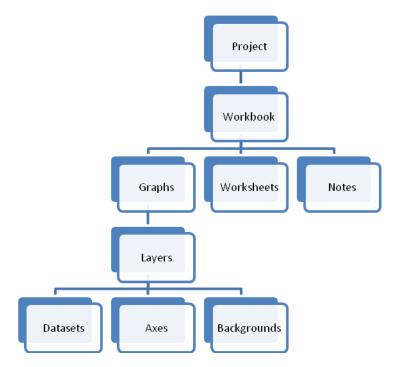
As required by the CDOM research community, the concerted application of the instrumental spectral corrections, Rayleigh-line masking, water-Raman subtraction, Raman or OSU normalization and IFE correction are readily enabled by the EEM-processing tools in our Aqualog<sup>®</sup> software. As mentioned above, the purpose of the spectral corrections and EEM-processing is to make the identification and quantification easier of the CDOM components that are usually based on a reference-component library or model. Here we focus attention on a popular and promising library-based multivariate technique for CDOM analysis, namely, PARAFAC, which has been do-cumented extensively by researchers including many using HORIBA's fluorescence instruments. Importantly, the Aqualog<sup>®</sup> software offers direct access to a MatLab<sup>®</sup> console for purposes of processing data using the PARAFAC tools in N-way Toolbox, a public-domain package especially developed for CDOM analysis. The modeling advantages of PARAFAC center on its ability to simultaneously evaluate the EEM data as a matrix, and to envelop multiple (often hundreds) of EEMs simultaneously for increased statistical significance. PARAFAC has been successful at identifying a wide range of CDOM components including humic and fulvic acids, tryptophan- and tyrosine-like substances, quinones, several polycyclic aromatic hydrocarbons, and distinguishing microbial, marine and terrestrial CDOM sources. More importantly, PARAFAC has been used to diagnose trends in CDOM components as a function of several key chemical and physical parameters, including water-recycling-plant treatment stages, sewage dispersion, stream flow, and ocean and estuarial currents, among many others. Indeed, the application of PARAFAC has been proposed as a standard modeling technique for a variety of water-quality applications.

### Projects and files

### What is a project?

A project is a collection of workbooks of data, which hold:

- Graphs (visual diagrams of the data)
- Worksheets (tables of data)
- Notes (comments about the data)



Graphs themselves may contain multiple kinds of information, including separate layers describing the data, the axes, the background colors, etc.

Concerning worksheets, a dataset must contain at least two columns, corresponding to x-y data pairs. Multiple y columns may correspond to a single x column.



*Note:* For greater detail about projects, graphs, layers, and how to merge, combine, and separate them, see the Origin<sup>®</sup> on-line help files.

Rearrange Layout

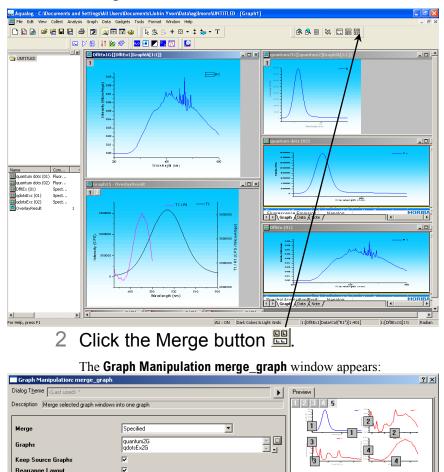
 Page Setup 🗄 Scale Elements

🗄 Arrange Settings E Spacing (in % of Page Dimension)

### Merging two or more graph windows

This puts all the open layers on one single page.

#### 1 Close all graph windows you don't want to merge.



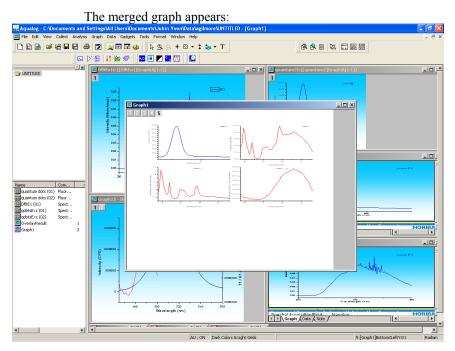
3 the files to merge.

Cancel

- 4 Activate the listview checkbox.
- 5 Select the desired graphs to merge.
- 6 Click the >> button to add the desired graphs to the combining list.
- 7 Click the OK button.

The window closes, and the  $\ensuremath{\mathsf{Preview}}$  updates with both graphs together.

8 Click the OK button.



### Splitting two graphs by extraction

This extracts each plot to a separate layer in the graph.

- 1 Click on the desired plot to activate it.
- 2 In the toolbar, choose the Extract to Layers button ⊑.

|        | ett agsMill Users/DocumentsNichlin Yvon/Oataloglimore/UNTITLED - (Graph1) |       |
|--------|---|-------|
|        | Graph Jeta Gatigets Book Formar Without Help                              | . # X |
|        |   |       |
| 100000 |   |       |
|        | The Graph Manipulation layextract window appears:                         |       |
|        | Graph Manipulation: layextract  |       |
|        | Dialog Theme  |       |
|        | Description Extract specified layers to separate graph<br>windows         |       |
|        |   |       |
|        | Extracted Layers 1:0  |       |
|        | Keep Source Graph 🔽   |       |
|        | Full Page for Extracted 🔲   |       |
|        |   |       |
|        | OK Cancel   |       |
| 0      |   |       |

### 3 Click the OK button.

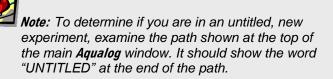
The new graphs appear.



*Note:* Other buttons available using the Customize Toolbar command are the button for splitting each layer into a separate graph window, and the button for merging all open graph windows into one graph. See the Origin<sup>®</sup> on-line help for more information.

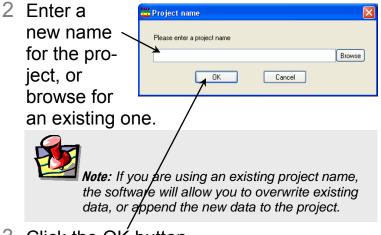
## Saving and recalling a file

To save a project, when in a new, untitled project



### 1 Run an experiment.

When the experiment is complete, the **Intermediate Display** disappears. The **Project Name** window appears.

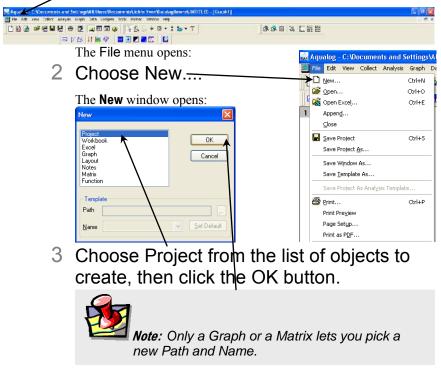


3 Click the OK button.

The path of the project appears at the top of the main **AquaLog** window. The data are now saved.

# To save data into a new project when another project is already open

1- Choose File.



#### 4 Run the experiment. 🛃 Aqualog - C:\Documents and Settings\V le Edit View Collect Analysis Graph D <u>N</u>ew... Ctrl+N The data are now in an untitled project. ൙ Open... Ctrl+O Next you must create the name for the 🗟 Open Excel... Ctrl+E file. Append... ⊆lose 5 Choose File again. 📕 Save Project Ctrl+S Save Project As. The File menu opens. Save Window As... Save Template As... 6 Choose Save Project Save Project As Analysis Template. 🖨 Print... Chrl+P As.... Print Preview Page Setup...

The Save As window appears:

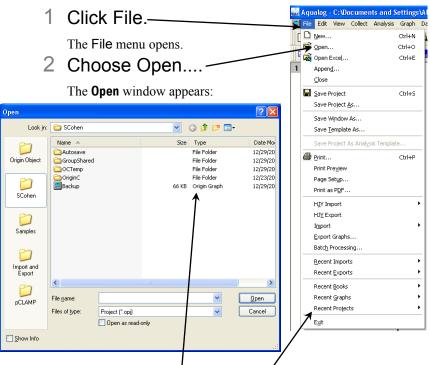
Print as PDF...

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| Incort and Fagumer INTER   | 21             |  |                 |       |  |   |
| Export Filo games VINTILED Save  |                |  | 112             |       |  |   |
|  |                | ne:                                      | UNT TEED        |       | ×  | Save  |
| Eave as type: Project (".opi)  | Eava a         | stype:                                   | Pro ect (".opi) |       | ~  | Cancel  |
| LCT/MP   | HULIMP         |  |                 |       |  |   |

- 7 In the File name field, enter a name. In the Save as type field, choose Project (\*.opj) from the list.
- 8 Click the Save button.

Now the project has a new name.

### To recall and open an existing project



- 3 Browse for the desired project, or examine the Recent Projects list.
- 4 Click the Open button.

The project opens.

# 4: Shutting Down Aqualog<sup>®</sup> Software

- 1 Save experiment files (and data files, if created).
- 2 In the Aqualog Experiment Setup window, click the Close button ⊠ or the Cancel but-

ton Cancel

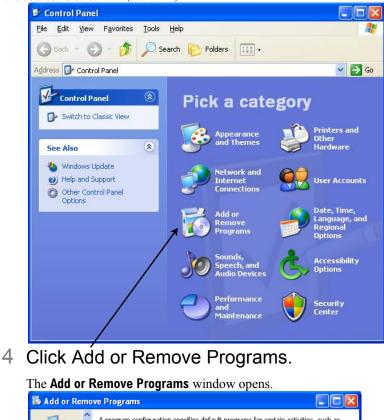
|      | FluorE           | ssend            | :e - C:\   | Docume |
|------|------------------|------------------|------------|--------|
| File | Edit             | View             | Collect    | Graph  |
| Ľ    | <u>N</u> ew      |                  |            | Ctrl+N |
| 2    | Open             |                  |            | Ctrl+O |
|      | Appen <u>d</u>   |                  |            |        |
|      | ⊆lose            |                  |            |        |
|      | <u>S</u> ave Pr  | oject            |            | Ctrl+S |
|      | Save Pr          | oject <u>4</u>   | <u>4</u> s |        |
|      | Save W           | indow            | As         |        |
|      | Sa <u>v</u> e Da | ata As,          |            |        |
|      | Page Se          | etyp             |            |        |
| 9    | Print            |                  |            | Ctrl+P |
|      | Print Pre        | e <u>v</u> iew   |            |        |
|      | Import           |                  |            | •      |
|      | Expo <u>r</u> t  |                  |            | +      |
|      | Impor <u>t</u> I | ímage            |            |        |
|      | Export P         | <sup>o</sup> age |            |        |
|      | Batch E:         | xport            |            | •      |
|      | Recent           | Import           | s          | •      |
|      | Recent           | Export           | s          | •      |
|      | Recent           | <u>B</u> ooks    |            | •      |
|      | Recent           | Graph            | s          | •      |
| 7    | <u>R</u> ecent   | Projec           | ts         | •      |
|      | E <u>x</u> it    |                  |            |        |

# 5: Un-Installation

- 1 Close Aqualog<sup>®</sup> software.
- 2 Click the Start button to open the Start menu.



The Control Panel opens:



|  |   | 10 1 1 0 <u>0</u> minu   |      |
|--|---|--|------|
| C <u>h</u> ange or<br>Remove<br>Programs       | ^ | A program configuration specifies default programs for certain activiti<br>Web browsing or sending e-mail, and which programs are accessible f<br>menu, desktop, and other locations.<br>Choose a configuration: |      |
| Î.   |   | O Computer Manufacturer  | ۲    |
| dd <u>N</u> ew                                 |   | Microsoft Windows  | ۲    |
| Programs                                       |   | Non-Microsoft  | ۲    |
| 5  |   | • Custom   | ۲    |
| Add/Remove<br><u>W</u> indows<br>Components    |   |  |      |
|  |   |  |      |
| Set Pr <u>o</u> gram<br>Access and<br>Defaults | * | OK Cancel  | Help |

5 Click the Change or Remove Programs icon.

A list of currently installed programs on the host computer appears:

| 6                               | move Programs  |              |               |          |   |
|---------------------------------|--|--------------|---------------|----------|---|
| 5                               | Currently installed programs:                                | Show updates | Sort by: Name |          | * |
| Change or<br>Remove<br>Programs | 録 EPSON Printer Software<br>録 FFmpeg for Audacity on Windows |              | Size          | 19.55MB  | ^ |
| 2                               | 🔂 FlashDWG   |              | Size          | 0.63MB   |   |
| Add New<br>Programs             | 🥠 GanttProject   |              | Size          | 14.45MB  |   |
| Programs                        | 🃸 Garmin Communicator Plugin                                 |              | Size          | 11.67MB  |   |
| 6                               | 🚯 Garmin USB Drivers   |              | Size          | 0.12MB   |   |
| Add/Remove<br>Windows           | HJY Application Software 3.6                                 |              | Size          | 696.00MB | Ξ |
| <u>windows</u><br>Components    | 📷 HJY (Pan System  |              | Size          | 0.44MB   | _ |
|                                 | 🥧 HJYApplication Upgrade                                     |              | Size          | 792.00MB |   |
|                                 | 🔮 HP Software Update   |              | Size          | 3.79MB   |   |
| Set Program<br>Access and       | 💕 imagePROGRAF Status Monitor                                |              | Size          | 19.55MB  |   |
| Defaults                        | ig Intel(R) Extreme Graphics 2 Driver                        |              |               |          |   |
|                                 | Intel(R) PRO Network Adapters and Drivers                    |              | Size          | 2.89MB   |   |
|                                 | 💓 Intel(R) PROSet  |              |               |          |   |
|                                 | 🕼 iF5100 Media Configuration Tool                            |              | Size          | 32.25MB  |   |
|                                 | PF5100 Printer Driver Extra Kit                              |              | Size          | 36.73MB  |   |
|                                 |  |              | Size          | 161.00MB | ~ |
|                                 | Iava 2 Runtime Environment SE v1 4 2 03                      |              | Cinn          | 107 00MD |   |

# 6 Click HJY Application Software 3.6, which becomes active:

| 5                                 | Currently installed programs:  | ow updates Sort by: Name          |                    |
|-----------------------------------|--|-----------------------------------|--------------------|
| Change or<br>Remove<br>Programs   | 🛃 FlashDWG   | Size                              | e 0.63MB           |
| riograms                          | 🎻 GanttProject   | Size                              | 14.45MB            |
| <b>P</b>                          | 🍃 Garmin Communicator Plugin   | Size                              | e 11.67MB          |
| Add New                           | 🚱 Garmin USB Drivers   | Size                              | 0.12MB             |
| Programs                          | HJY Application Software 3.6   | Size                              | e <u>696.00MB</u>  |
| 6                                 | Click here for support information.                                  | Usec                              | occasionally       |
| dd/Remove<br>Windows<br>omponents | To change this program or remove it from your computer, click Change | Last Used Or<br>or Remove. Change | 5/6/2011<br>Remove |
|                                   | 📷 HJY Clean System   | ş/a                               | 0.44MB             |
|                                   | 🥁 HJYApplication Upgrade   | Size                              | 792.00MB           |
| et Program<br>Access and          | 🔮 HP Software Update   | Size                              | a 3.79MB           |
| Defaults                          | 💕 imagePROGRAF Status Monitor  | Size                              | 19.55MB            |
|                                   | Intel(R) Extreme Graphics 2 Driver                                   |                                   |                    |
|                                   | 🗰 Intel(R) PRO Network Adapters and Drivers                          | Size                              | 2.89MB             |
|                                   | 🗰 Intel(R) PROSet  |                                   |                    |
|                                   | IPF5100 Media Configuration Tool                                     | Size                              | 32.25MB            |
|                                   | 👼 iPF5100 Printer Driver Extra Kit                                   | Size                              | e 36.73MB          |

- 7 Click the Remove button.
- 8 Follow the instructions to remove Aqualog<sup>®</sup> software.
- 9 You may need to reboot the host computer.

Aqualog<sup>®</sup> software is removed from the host computer.

10Remove the USB key from the USB port.

# 6: Aqualog<sup>®</sup> Software Troubleshooting & Technical Support

## Troubleshooting

If the special buttons are gray,

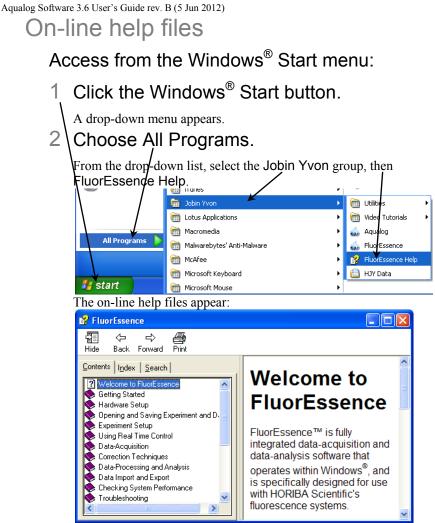


## 1 Exit and restart the Aqualog<sup>®</sup> software.

The special buttons should become active again.

### 2 If step 1 doesn't fix the problem,

- a Exit the software.
- **b** Shut down the Aqualog<sup>®</sup> instrument.
- C Restart the instrument and Aqualog<sup>®</sup> software.



Resize the window to your liking.

Access from the **Experiment Setup** or **Real Time Control** window:

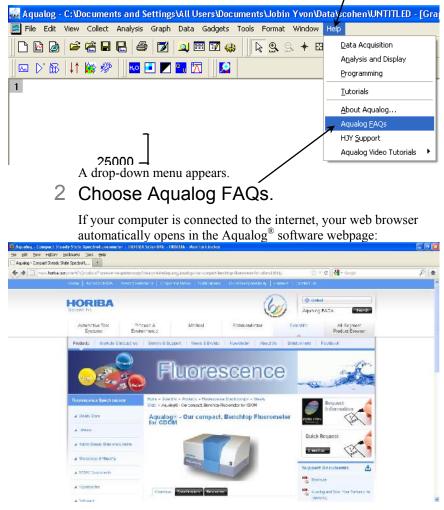
1 Click the Help button  $\square$  or the F1 key.

Context-sensitive on-line help files appear. Resize the window to your liking.

# Frequently-asked questions about Aqualog<sup>®</sup> software

Many frequently-asked questions (FAQs) about Aqualog<sup>®</sup> software may be found on the HORIBA Scientific website.

### In the Aqualog toolbar, choose Help.



### Video tutorials

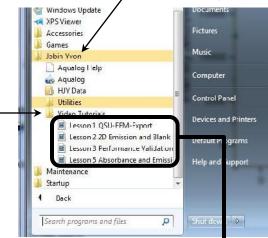
For some common procedures, video tutorials are available to guide you. The videos are .avi files, which can be played by software such as RealPlayer<sup>®</sup>, Windows Media Player, etc.

## Access to video tutorials

### 1 Click the Windows<sup>®</sup> Start button.

The Start menu appears.

- 2 Choose All Programs.
- 3 Choose the Jobin Yvon group.



4 Choose the Video Tutorials subgroup.5 Click on the desired tutorial.

The tutorial opens in your chosen video-playing software.

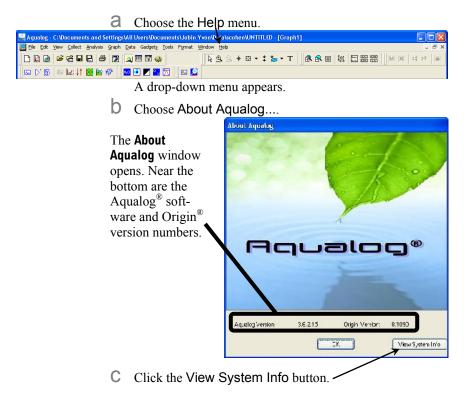


## If you have a technical problem,

Please consult the Aqualog<sup>®</sup> software help files and this User's Guide, as well as all other manuals supplied with the system.

If you are unable to solve the problem,

- 2 Note the problem and any accompanying error messages.
- 3 Determine Aqualog<sup>®</sup> software's version number.



Aqualog Software 3.6 User's Guide rev. B (5 Jun 2012) The **Installed Components** window appears, displaying all the software required for Aqualog<sup>®</sup> software.

| Installed Comp   | onents  |   |  |
|--|---|---|--|
| N/ Course  |   |   |  |
| JY Compor  |   | Verier  | Date   |
|  | ent Name  | Version<br>3.6.2.15   |  |
| Configure  | icationsCom.dll<br>a.dll  | 3.6.2.15  | Wednesday, August 03, 2011, 19:40:32<br>Wednesday, August 03, 2011, 19:51:36   |
| DataPrev   | viewEngine.dll  | 3.6.2.15  | Wednesday, August 03, 2011, 19:54:36   |
| Experime   | ntEngine.dll  | 3.6.2.15  | Wednesday, August 03, 2011, 19:52:40   |
|  | ogSetup.dll   | 3.6.2.15  | Wednesday, August 03, 2011, 19:57:32   |
| FLExpSe  |   | 3.6.2.15  | Wednesday, August 03, 2011, 20:02:56   |
| Initializati   |   | 3.6.2.15  | Wednesday, August 03, 2011, 20:03:10   |
| JYCCD.d  | n0bjects.dll  | 3.6.2.15<br>3.6.2.15  | Wednesday, August 03, 2011, 19:46:32<br>Wednesday, August 03, 2011, 19:41:02   |
|  | BrowserComponent.dll  | 3.6.2.15  | Wednesday, August 03, 2011, 19:41:14   |
| JYDevice   | eConfig.dll   | 3.6.2.15  | Wednesday, August 03, 2011, 20:03:36   |
| JYDSP.d  |   | 3.6.1.91  | Tuesday, July 12, 2011, 19:40:18<br>Wednesday, August 03, 2011, 19:47:14   |
| JYFilterW  |   | 3.6.2.15  | Wednesday, August 03, 2011, 19:47:14   |
| JYGener  | alConfig.dll  | 3.6.2.15  | Wednesday, August 03, 2011, 20:05:16   |
| <  |   |   | 3  |
| Third Parts  | Components  |   |  |
|  | ent Name  | Version   | Date   |
| cw3dgrp  |   | 8.6.0.0   |  |
| cwanalys   | sis.ocx   | 6.0.0.0   |  |
| cwdaq.o  | CX  | 8.1.0.0   | Thursday, September 20, 2007, 22:06:44   |
| cwui.ocx   |   | 8.1.0.0   | Thursday, September 20, 2007, 22:06:44   |
| gspciolib.<br>HHActive   | uu.<br>eX dli   | 6.0.0.0<br>6.2.0.58   | Monday, February 03, 2003, 15:25:08<br>Wednesday, October 21, 2009, 09:37:32   |
|  | Library.ocx   | 3.1.0.668   | Wednesday, October 21, 2003, 03:37:32<br>Wednesday, October 21, 2009, 09:37:48   |
|  | ibrary.ocx  | 3.1.0.428   | Wednesday, October 21, 2009, 09:37:48  |
| iStripCha  | rtXControl.ocx  | 3.1.0.341   | Wednesday, October 21, 2009, 09:37:48  |
| jyezusb.s  |   | 1.0.2.0   | Wednesday, October 21, 2009, 09:37:52  |
| jyldr2.sys   |   | 1.0.2.0<br>1.0.2.0  | Wednesday, October 21, 2009, 09:37:52  |
| jysbloade<br>LStep4.d  | si.sys  | 6.2.0.59  | Wednesday, October 21, 2009, 09:37:52<br>Wednesday, October 21, 2009, 09:37:32   |
| msxml3.d   |   | 8.100.1052.0  | Monday, June 14, 2010, 03:41:45  |
| 1  |   | 0.00.0700.1   | T 1 H 100 0005 10 0110   |
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| Save To File   | Zip Info Prin   | t Info  | <b>7</b> •   |
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### 5 Please contact a HORIBA Scientific Service Department listed below.

Be prepared to describe the malfunction and the attempts, if any, to correct it. Note any error messages observed, and have any relevant spectra (sample, validation tests, etc.) and system information ready for us to assist you.

## Contact information

### Via the internet:

| World-Wide Web | www.horiba.com/scientific |
|----------------|---------------------------|
| E-mail         | info.sci@horiba.com       |

### In North America:

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| Italy   | +39 (0) 2 57603050   |
| Japan   | +81 (0) 3 58230141   |
| UK      | +44 (0) 20 8204 8142 |

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