

Aqua4Plus

Control Software
for Seametrics Smart Sensors



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What is Aqua4Plus?

Aqua4Plus is Seametrics' easy-to-use Windows-based software for communicating with and controlling Seametrics' state-of-the-art Smart Sensors.

Aqua4Plus is designed to control a number of separate sensors. Aqua4Plus communicates with Seametrics Smart Sensors using the industry standard Modbus® communication protocol.

Smart Sensors collect and store data internally as user-programmed in Aqua4Plus. The Aqua4Plus software is also used to view, retrieve, and export the collected data.

System Requirements

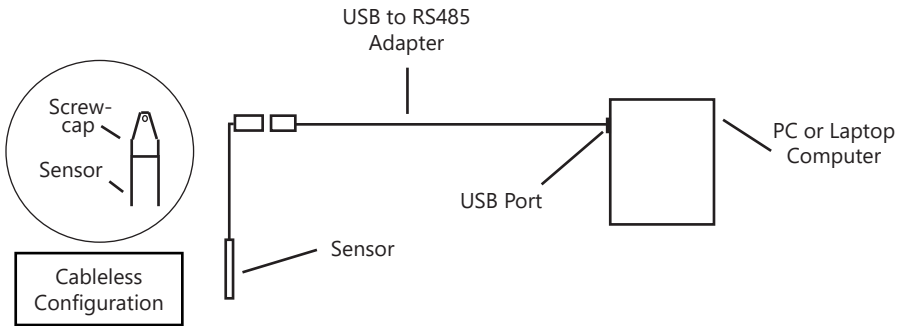
- Desktop or laptop computer running WinXP(SP3) or higher
- 20 MB free hard drive space
- USB port for installing the program and for communicating with sensors. (The program can also be installed over the Internet.)
- NOTE: The software may not work reliably on ultra-high definition (4K) laptops and monitors.

About this Manual

This manual contains in-depth instructions on basic aspects of using Aqua4Plus, including initial setup, controlling the sensors, and retrieving data.

Connecting the Sensor to a Computer

In its cabled configuration, the sensor cable is terminated with a weather-resistant connector. In its cableless configuration, the sensor is terminated with a weather-resistant connector inside a screw-cap. Connect the weather-resistant connector to your computer's USB port as shown below. (For alternate connection options, see Appendix E.)



*Connect the sensor to your PC using a USB to RS485 adapter.
(See Appendix E for alternate connection options.)*

When using Aqua4Plus with Seametrics' USB/RS485 cable, drivers will need to be installed on your computer. If you are connected to the Internet when you first plug in the cable, it will normally obtain and install the correct drivers automatically. If this does not happen or if you do not have Internet connection, you can use Aqua4Plus to install the drivers. From the Utilities Menu, select Install USB/RS485 Drivers. Select your Windows operating system, and then click Install.

Installing the Aqua4Plus Software


If your software is supplied on USB stick:

1. Insert the USB stick into your PC or laptop.
2. Using Windows Explorer, navigate to the Aqua4Plus Standard folder on the USB stick.
3. Double click on setup.exe
4. The Installation program will guide you through the installation process.

From the Internet:

1. Download Aqua4Plus from www.seametrics.com
2. Unzip the file onto your computer.
3. Double click setup.exe
4. The Installation program will guide you through the installation process.

Once the software has successfully completed installation, you can remove the USB stick from your computer and store it in a safe place.

To start the Aqua4Plus software, use the Start Menu to navigate to the program group you selected during installation (typically this will be Aqua4Plus), and then click the Aqua4Plus  icon.

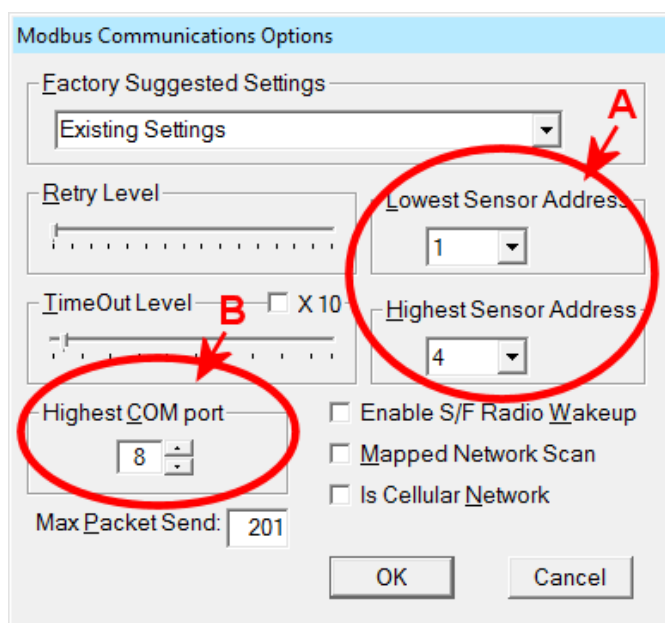
First Time Setup

If you have just installed Aqua4Plus, please take a few minutes to go through the setup options and configuration.

Options Menu

Use the Options Menu to control settings for the Aqua4Plus software. (Use the Configure Menu to control settings for sensors.)

- | | | |
|-----------------|---|--|
| Display Units | - | Use this option to select the units in which to display your data. This will control how data is represented on the Real Time Monitor, the File Display Window, the Graph Window, and for exported data. |
| Default Folder | - | Aqua4Plus saves and looks for files in a default folder. Use this option to select a default folder location. |
| Communication | - | Use this to set the communications options for communicating with the sensor.
A. Set the Lowest and Highest sensor addresses you will be scanning.
B. If you are using a COM port higher than 8, increase the Highest COM port to at least that high (maximum of 15).
All other settings will automatically adjust, and you will rarely need to make changes unless instructed to do so by a Seametrics service representative. |
| Baud Rate | - | Set baud rate for <u>Aqua4Plus</u> . Note: Change <u>sensor</u> baud rate under Configure Menu, Advanced option. |
| Change Password | - | Change the password that is required for some advanced options. |

*Communication Options*

Use the Configure Menu to set options on individual sensors. Note that not all options will be available on all types of sensors. The program determines what sensor you are connected to and lists configuration items available for that sensor. In order to access items on the Configure Menu, you must first connect to and select the sensor whose configuration you want to set. (See Finding, Selecting, and Viewing Sensors, page 10.)

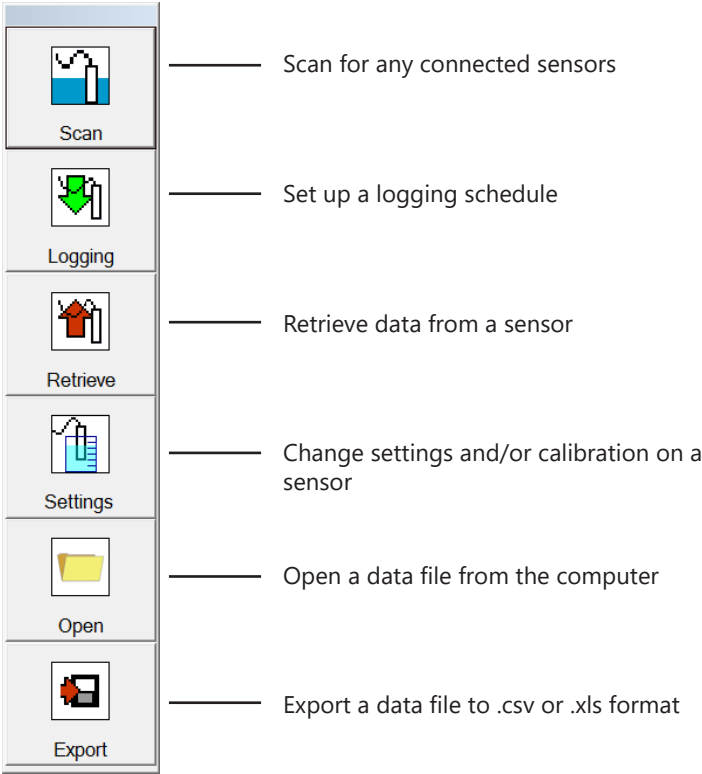
- Battery Information Reset*** - See Appendix B

Advanced

- Download Firmware** - Downloads an updated version of the firmware to the sensor, requires a password. Contact Seametrics factory personnel for details.
- Filtering Level*** - Some sensors have the ability to apply some filtering to incoming data in order to smooth out minor variations in readings. See the sensor manuals for details.
- Sensor Baud Rate*** - Sets alternate baud rate on sensor – 38400 (default), 19200, or 9600.
- SDI-12 Seup*** - On some sensors, you can specify what SDI-12 commands return readings from which channels. If this is not visible, then it is not available for the connected sensor.
- Direct Read Units*** - Use to set engineering units when not using Aqua4Plus.

Depending on the sensor, there may be additional options. Refer to specific sensor manuals for details.

In addition to the standard menus and tool bar, Aqua4Plus has a “Simple” tool button bar that can be turned on. This “floating” tool button bar provides quick access to most common functions. The tool bar may be moved wherever you want on the screen and it will always stay on top in easy reach. When you close Aqua4Plus, it will remember the last location and return there once the program is reopened.

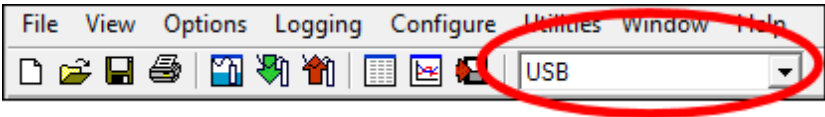


By default, the Simple Button bar is not activated. To activate the Simple Button bar, select Simple Buttons from the View Menu. From the popup box, you can select to turn off the button bar, use the button bar with Latin characters, or use the button bar with Non-Latin characters. When selecting Latin characters, you can customize the text on the buttons, if desired. When selecting Non-Latin characters, the only current option is Japanese. Click OK to save your changes.

Selecting a Communication Port


Aqua4Plus communicates with the smart sensors via a USB or a COM port on the PC. When Aqua4Plus is first opened, it polls the computer for all available communication ports. These are then listed in the connection port drop-down box on the tool bar. By default, Aqua4Plus looks for USB and COM 1 through COM 8. If you are using a higher COM port, specify the highest COM port on the Communications dialog box under the Options menu.

To select the port you are using, click on the down arrow, and then click on the port to which your sensor is connected.

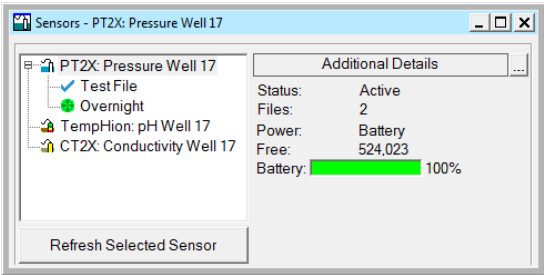


Connection Port Drop-Down Box

Finding, Selecting, and Viewing Sensors

Once the port has been selected, open the Sensor Window by clicking the  tool button (or View Menu | Sensor Window). The software will scan for any connected sensors. A list of connected sensors will appear on the Sensor Tree.

On the Sensor Tree, double-click to select a sensor. A list of data files stored on the sensor will be displayed below the sensor. Information regarding the selected sensor will display in the Sensor Information Panel to the right of the Sensor Map.




Click here to get additional details, as shown below.

Additional Details	
Sensor Desc:	Pressure Well 17
Sensor Type:	PT2X
Modbus	2
Serial Number:	0021304156
Firmware	2.13
Temperature Range: -40 - +125 degC	
Pressure Range: 15 psig	






Sensor Tree and Sensor Information Panel

Note that the information shown on the Sensor Tree and the Sensor Panel is static information. In other words, the program looks at the sensor and displays the information, but it does not keep going back to the sensor and getting the newest information. This is to save battery life on the sensor. To update the information on the Sensor Tree and the Sensor Panel, click on the “Refresh Selected Sensor” button below the Sensor Tree. This will requery that particular sensor and update the display.

Sensor Tree:

The Sensor Tree displays a list of all sensors connected to the selected port. If no port is selected or no sensors are connected to that port, this tree will be empty. The Sensor Tree is an expanding tree display. Double-click on a sensor to expand the display to show data files, if any, currently stored on that sensor. Click on the  to the left of a sensor to hide the display of files for that sensor.


The different icons in front of each file indicate the current status, as follows:

-  Completed - has run to completion or has been terminated.
-  Paused - has been paused by operator.
-  Pending - awaiting a delayed start time.
-  Active - currently logging.
-  Configuring data area

Sensor Information Panel:

The top right portion of the Sensor Window displays information pertaining to the sensor that is selected on the Sensor Tree. This information will vary, depending on the type of sensor selected. Typical information may include:

Status:	Active	- sensor is currently logging.
	Paused	- logging has been paused.
	Pending	- logging is awaiting a delayed start time.
	Inactive	- no active, paused, or pending logging.
	Configuring...	- configuring data area
Files:	Number of data files stored on selected sensor. Maximum of 60.	
Power:	Battery or Auxiliary.	
Free:	Approximate number of records that can be stored before the sensor memory is full. Total number of records varies by sensor type.	
Battery:	Battery indicator - if Green, the battery is good, if Yellow, it is low, if Red, it is critically low.	

To view further details, click the ellipsis  in the upper right corner for a drop-down information panel. Typical information for this drop-down panel may include:

- Sensor Description:

User assigned description. (Set this description on the Configure Menu | Sensor Configuration | Set Sensor Description Option.)
- Sensor Type:

Factory assigned sensor type.
- Modbus:

This is the assigned Modbus address for the sensor. Each connected sensor must have a unique Modbus address. This address must be between 1 and 255. (Set this address on the Configure Menu | Sensor Configuration | Set Sensor Address.)
- Serial Number:

Factory set sensor serial number.
- Firmware Revision:

Sensor firmware revision number.
- Range/Element:

Sensor range and element information may also be displayed.

Using the Real Time Monitor

Real Time Data			▲	Start
Date / Time	Temperature(degC)	Pressure(psi)		
1-Apr-15 08:30:46	24.25	8.127	▼	Single
1-Apr-15 08:30:47	24.25	8.137		
1-Apr-15 08:30:48	24.25	8.148		
1-Apr-15 08:30:49	24.25	8.158		
1-Apr-15 08:30:50	24.25	8.168		
1-Apr-15 08:30:51	24.25	8.179		
1-Apr-15 08:30:52	24.25	8.189		
1-Apr-15 08:30:53	24.25	8.199		
				Clear

Real Time Monitor

Use the Real Time Monitor (lower part of Sensor Window) to view live readings from the sensor that is selected on the Sensor Tree. These readings are not being recorded in the sensor, but only displayed for real time viewing. The Real Time Monitor can be used whether or not the sensor is actively recording.

To obtain and display a single reading, click the *Single* button.

To obtain and display readings continuously for 60 readings, click the *Start* button.

To stop the monitor, click the *Stop* button.

The Monitor displays a column for the sensor date/time and for each parameter being collected. Use the horizontal and vertical scroll bars as needed to adjust the view. Readings are displayed in the units selected from the Options Menu. For example, pressure might be displayed in psi or in Ft H₂O, or something else. (See earlier section for details on the Options Menu.)

Logging

The Smart Sensor collects and stores data. A series of steps is programmed describing the number of samples to record and the sampling intervals. Several files can be in the Smart Sensor memory at any one time, several *completed* files (along with their data) and one *active* file. An active file can be either logging, paused, or pending (waiting for a delayed start time). The maximum number of records that can be stored depends on the type of sensor. Check your sensor documentation for details.

The Logging Schedule Window is used to create and/or view logging schedules. A schedule is a description of the test steps necessary for a particular test. Schedules can be saved to disk for later use or sent to a sensor. Note: There can only be one active schedule on a sensor. Once a new schedule is sent to a sensor, any currently active logging is terminated and the new schedule begins. All previous logs on the sensor are retained, along with their data, until erased, but cannot be run again.

Logging Schedule

File Name: TempHion: pH Well 17

☐ Delayed Start ☐ Set Sensor Clock

Phase	Logging Interval dd/hh:mm:ss	# Records	Phase Duration dd/hh:mm:ss
1	00/00:01:00	100	00/01:39:00
2	00/00:30:00	10	00/05:00:00
3	00/01:00:00	10	00/10:00:00
4			

Start

Open

Save As


Clear

Delete

Logging Duration: 00/16:39:00

Logging Schedule Window

Creating Logging Schedules:

1. Create a new schedule by clicking the  tool button (or Logging Menu | New Logging Schedule). A Logging Schedule Window will open.
2. If you want to open a previously saved schedule, click the Open button, and then select the schedule you want. If you are satisfied with this schedule, skip to step 8. Otherwise, continue with the following steps.
3. Name your file by entering a name in the File Name box.
4. Describe test phases. Each schedule consists of up to 10 test phases. During data collection, these phases will be executed one after the other in sequence. Each phase can have different polling intervals and/or number of records. For example, you might want to record a reading every five seconds for 100 records, every 30 seconds for 100 records, and then every five minutes for the next 1000 records. The length of each phase shows in the right-hand column. The entire recording length shows at the bottom of the window.

To describe a test phase:

- Click in the Polling Interval column for the first phase.
- Enter your polling interval for this phase as dd/hh:mm:ss, where “dd” is number of days, “hh” is number of hours, “mm” is number of minutes, and “ss” is number of seconds between recordings. You only need to enter the smallest time interval you are using. For example, if you want a sample recorded every 10 seconds, you only need to enter *10* and then press the **Tab** key. The days, hours, and minutes will default to zero. Likewise, if you want a sample recorded every hour, you would enter *01:00:00*, and the days would default to zero.

Some sensors can take readings more often than once per second. This is known as a “continuous rate.” Different sensors have different available rates.



To use the continuous rate for a particular phase, enter the letter ‘c’ in the polling interval rather than a specific time interval. The sensor will then use the rate that had been saved on the sensor using the Sensor Continuous Rate option on the Configure menu.


- Enter the number of records to record at this polling interval.
- Press the **Tab** key and continue entering phases, as desired. (Note: Some sensors can only record one phase.)

5. If desired, select Delayed Start: Click the Delayed Start checkbox. Enter the date and time to start. Time is in 24 hour format. This option is especially useful when you want to collect and compare data from several sensors. Create a schedule; save it to disk. Connect to each sensor in turn and send the schedule to that sensor by clicking the start button. Note: For accurate data, be sure the clocks in all the sensors have been set to the same time. To do this automatically, checkmark the Set Sensor Clock on this window. (Alternately, see the Configure Menu for details on setting the clock).
 - Entering Date: Click on the day, month, and year and enter the desired start date. To select from a calendar, click on the down-arrow next to the date and time. Select your start date from the calendar.
 - Entering Time: Click on the hours, minutes, and seconds and enter the desired start time.





Note on Date: Internally in the sensor, only the day of the month is stored. Logging will start the next time the day of the month matches the day of the month you selected - regardless of the month! For example: Suppose you select January 8th as your start date. The sensor will start the first time the day of the month is equal to 8. If today is January 5th, then it will start on January 8th. If today is January 20th, it will start on February 8th.
6. If desired, checkmark Set Sensor Clock. If this is checked, the program will set the sensor clock to match the computer clock when sending the schedule information to the sensor. (Note: If this is not checked and the program detects that the sensor clock is more than five minutes different than the computer clock, it will give you the option of setting the clock.)
7. Repeating Schedules. Some sensors support repeating schedules. When a repeating schedule is selected all phases will run once and then the repeat. This will run over and over until all specified repeat times have elapsed or until the memory is full, whichever happens first. If your sensor supports repeating schedules there will be a checkbox labeled Repeat Schedule on the Logging Schedule window. Checkmark this box and then enter the number of times to run the schedule.
8. If desired, save the schedule to disk for future use: Click the Save As button, enter a file name or leave as is to accept the current file name, then click the Save button.
9. Send schedule to the sensor: Once you are satisfied with the schedule, you must send the it to the sensor. To do this, click the Start button. If you selected a delayed start time, the sensor will wait until the specified time and then begin collecting data, otherwise data collection will begin immediately.
(Note: Sending a schedule to the sensor will terminate any active, paused, or pending schedules - it will not erase any data.)

Pausing and Resuming:

You can manually pause and resume the logging on the sensor. To pause, click on the active file on the sensor map. (The active file will have a green icon  in front of the name.) Once the file has been selected, open the Logging Menu and select Pause. A hand icon  will display in place of the green icon.

To resume click on the paused file to select it. Open the Logging Menu and select Resume. The hand icon will once again change to a green icon. Note: you cannot resume a terminated or finished file, one with a blue checkmark .

Terminating:


Active logging (running , paused , or pending ) can be terminated manually at any time. On the Sensor Tree, click on the file to select it. Open the Logging Menu, and then select Terminate. The icon will be replaced by a blue checkmark .

Erasing Data:

To erase all data from the Smart Sensor, open the Configure or Logging Menu, and then select Erase All Data. You cannot erase individual files. Erasing deletes ALL data on the sensor. Be sure you have retrieved all important data before erasing.

Note: Many activities are also available by right-clicking the file name under the sensor.

Retrieving Data

- If the data files are not displayed on the Sensor Tree, double click on the sensor from which you will be retrieving.
- Click on the file you want to retrieve.
- Click the  tool button. The Save dialog box displays.
- Enter a file name or leave as is to save with the current file name.
- Select a file type (optional). Retrieving always saves the data in the Aqua4Plus Data File (.a4d) format. Files can additionally be saved in alternate formats.
- Click the Save button.
- Click Start.
- When retrieval is complete:
 - If you retrieved only the Aqua4Plus Data File (.a4d), you can now click on the Done button, or you can click on the View button to view the data in the File Display window. (See more details on the File Display window in the next section.)
 - If you retrieved in Text (.csv) format, the file will automatically be opened in the File Display window, and you will also be given the option of viewing it in Excel. (Note, you must have Excel installed on your machine in order to make use of this option.)


Viewing Data

Aqua4Plus displays collected data in both a tabular format and a graphing format.

Displaying Data in Tabular Format:



File Display - QuickTest.a4d			
Sensor SN	Sensor Type	Sensor Name	File
21304156	PT2X	Pressure Well 17	QuickTest
		Records	37
		Temperature(degC)	Pressure(psi)
	Sensor Range	-40 -- +125 degC	15 psig
	Minimum	24.13	8.279
	Maximum	24.31	8.715
	Mean	24.24	8.426
	Variance	0.002	0.0104
	Std Deviation	0.041	0.1018
	Field Cal Date	1-Apr-15 09:35	1-Apr-15 08:30
Rec#	Date/Time	Temperature(degC)	Pressure(psi)
1	1-Apr-15 09:35:33	24.13	8.715
2	1-Apr-15 09:35:34	24.13	8.664
3	1-Apr-15 09:35:35	24.19	8.602
4	1-Apr-15 09:35:36	24.19	8.539
5	1-Apr-15 09:35:37	24.19	8.485
6	1-Apr-15 09:35:38	24.19	8.430
7	1-Apr-15 09:35:39	24.25	8.379
8	1-Apr-15 09:35:40	24.19	8.330
9	1-Apr-15 09:35:41	24.25	8.289

File Display Window

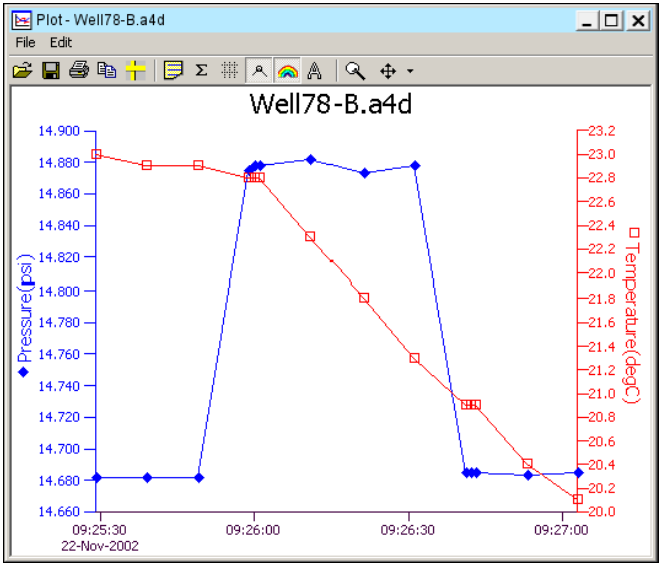
Click on the open button  (or File Menu | Open). Navigate to the desired file, and then click the Open button.

The File Display Window consists of two panels. The top panel displays various information about your data, such as number of records, file name, sensor name, etc.


The lower panel displays the actual data. The first few rows display statistical data about your records, including minimum, maximum, and mean values, as well as the variance and standard deviation. The remaining rows display the actual data.


Click on the graph button  to switch to graphing view. You can switch back to the tabular view by clicking on the file display button .

Displaying Data in Graphing Format:



Graphing Window

Click on the graphing icon  to open the Graphing Window. This window displays data that has been saved on your computer (files with an extension of .a4d). Navigate to the desired file, and then click the Open button.

The graphing window is a free-floating window and can be placed outside the main Aqua4Plus window frame. It is often easier to view the graph with the graphing window maximized. Click the maximize button  in the upper right corner of the graphing window to view in maximized mode.



Click to open a new file. (Alternate = File Menu | Open)



Click to export the graph as a graphic file (.jpg, .gif, .bmp, or .png). (Alternate = File Menu | Export Graph)



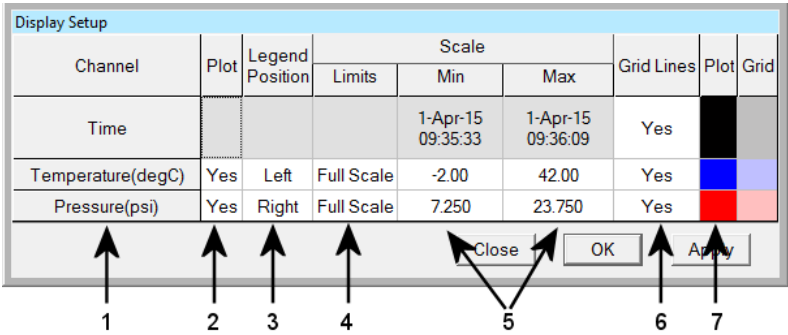
Click to print the graph. What is seen on the screen will be printed – i.e., if notes or statistics are turned on, they will print. If the graph is zoomed in, it will print only the area showing on the screen.



Click to copy and paste to the Window's clipboard. Only the graph will be copied. To copy the Notes, highlight the notes and then click copy.



Click to open the Display Setup dialog box and change various display attributes.



Graph Display Setup

- Channel* - Lists all channels available to be plotted for the particular data file.
- Plot* - Click to toggle whether or not to plot any particular parameter. Note: Time is always plotted and is always along the bottom of the graph.
- Legend Position* - The legend for any parameter (except Time) can be displayed either to the left or to the right of the graph. Click here to toggle between left and right.
- Scale Limits*
 - Full Scale* - Minimum and Maximum scales set to full scale for that channel on the sensor whose data is being displayed.
 - Data* - Minimum and Maximum scales set to minimum and maximum data values for that channel in the displayed data file.
 - User* - Set your own Minimum and Maximum scales.
- Scale Min/Max* - Displays current Minimum and Maximum scale values. Click and type in these boxes to change values for User defined scales.
- Grid Line* - Enable grid lines for any particular channel. Note: Grid lines only show on the graph when the grid lines tool button is depressed.
- Plot Color* - Click to change color for any particular channel. Click the color under grid to change the grid line color for that parameter.



Click to add notes to your graph. You can add up to 500 words below the graph.



Click to display statistics below the graph (min, max, mean, variance, standard deviation, and field calibration values).



Click to turn grid lines on or off. Only grid lines enabled on the display setup will show.



Click to turn discrete points on or off.



Click to change from color to black and white. Some printers print better in plain black and white.




Click to change the size, color, and style of the font. Note that size and style affect all fonts on the graph, while color affects only the title.




Click to zoom in. Cursor will change to an arrow with an attached box. Click and drag to enclose the area you want to zoom.




Click the down arrow to right of icon to select scale:

Full Scale - Minimum and Maximum scales set to full scale for ALL channels on the sensor whose data is being displayed. (Set individual channels, if desired, under Display Setup )


Data

- Minimum and Maximum scales set to minimum and maximum data values for ALL channels in the displayed data file. (Set individual channels, if desired, under Display Setup )

User

- Select the user defined Minimum and Maximum scales specified under Display Setup .

Exporting Data

- Using the File Display window, open the file you want to export.
- Click on the  tool button.
- Select a file type, either the default Text (.csv) or Excel (.xls).
- Select a file location and enter a name for the file or leave as is to accept the current file name.
- Click Save. You will be given the option of viewing it in Excel. (Note, you must have Excel installed on your machine in order to make use of this option.)

** If you are using Windows 10, you will not be given the option of exporting to .xls or to open the file in Excel. It will simply export the data to a .csv (comma separated values) file. See Importing Data Into a Spreadsheet, below, on how to import the .csv file into Excel.*

Importing Data Into a Spreadsheet

To import data to a spreadsheet or database, you must first Retrieve and Export the data to a .csv or .xls file. (See previous sections on retrieving and exporting.) Most spreadsheets and databases can readily import .csv files. Microsoft® Excel can import either .csv or .xls files. Following are instructions for importing a data file into Excel. For importing into other programs, see documentation with the particular program.

- Open Excel.
- Click on the File menu, and then select Open.
- On the Open dialog box, click the down-arrow to the right of the File Types dropdown box.
- Click the option All Files.
- Navigate to the saved file, and then click the Open button in the lower right corner of the dialog box.

The data will be opened in Excel. (Note: While Aqua4Plus can handle over 500,000 records, Excel versions prior to version 2007 were limited to approximately 65,000 records.)

Appendix A: Sensor Setting and Calibration

To adjust sensor channel offsets, calibration, depth-to-water or elevation, and other various settings, select the Settings and Calibration option on the Configure Menu. In the Settings and Calibration window, click on the channel you want to adjust. Specific instructions for each channel are displayed in the right panel. Different sensors have different available settings. Refer to the specific sensor manual for further details.

Settings and Calibration

PT2X: Pressure Well 17

Channels

1: Temperature
2: Pressure

Channel Label:

Pressure

Cal Date:

1-Apr-15 08:30

slope:

1.000000

offset:

8.0000 psi

Comment

Select Setting Type

Depth/Submergence

Calculator

First Point

Second Point

Ref. psi:

slope:

Measured:

offset:

Measure

Measure

Apply

Submergence

Submergence

Step-by-Step Instructions

Submergence

One-Point Calibration:

-- Computing Offset --

- Place sensor in the fluid you are measuring at a precise known level.
- In the **Ref** box for the first point, enter this level or pressure.
- Click first **Measure** button.
- When readings have stabilized, click the **Accept** button in the pop-up box.

-- Applying Offset --

- Click the **Apply** button to apply calculated offset.
- The calculated offset will be transferred to the offset field near the top of the window.
- Click **OK** to save the value to the sensor!!!

Two-Point Calibration:

-- Compute First Calibration Point --

- Place sensor in the fluid you are measuring at a precise known level.
- In the **Ref** box for the first point, enter this level or pressure.
- Click first **Measure** button.

OK

Cancel

Settings and Calibration Window

Appendix B: Battery Information and Reset

Some sensors have an internal battery life calculator based on usage and type of batteries. If your sensor supports this feature, it will be available from the Configure Menu - Battery Information and Reset. **Whenever you change batteries in your sensor, you should open this window, checkmark the box that says you have just put in new batteries, and select the battery type.** Once this has been done, the battery level displayed on the main sensor panel will show the estimated life remaining as a percentage*. If your sensor does not have this feature the battery level on the sensor panel will show the actual battery voltage rather than percent of life remaining.

Battery Information and Reset

PT2X: INW Smart Sensor

Checkmark the box below if you have just put in fresh batteries. Be sure the correct battery type is selected below.

☒ I have just put in fresh batteries

Battery Type:

Alkaline AA (Long-Life)

Percent Battery Life Remaining:

100 %

Current Battery Voltage:

2.7 V

Date Batteries Last Changed:

27-Apr-2015

Save and Redisplay

Save and Close

Cancel

Battery Information and Reset Window

* If your sensor has this feature but it has not been set, then the battery life bar may not display on the sensor panel.

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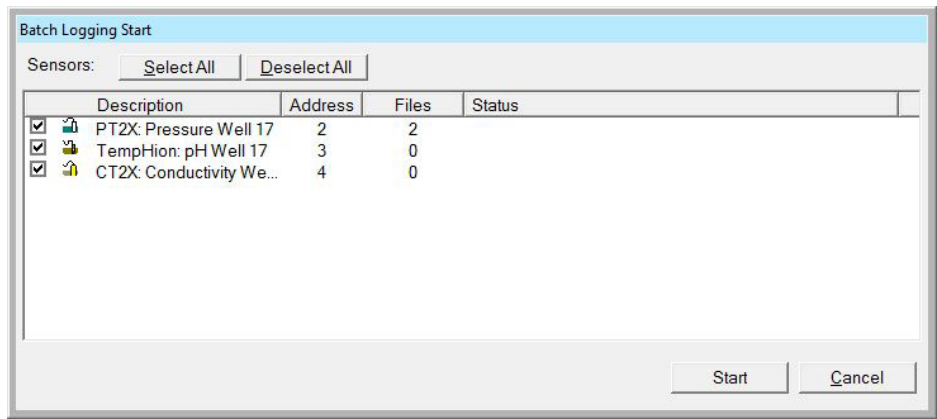
Appendix C: Batch Operations

Aqua4Plus can start logging on several sensors with a single command. Likewise, data can be retrieved and/or erased from several sensors at once. This functionality works on PT2X, CT2X, and TempHion Smart Sensors.

Accessing Batch Operations

The Batch Operations commands are located on the Logging Menu. Click on Batch Operations and a fly out menu will list the available options.

Each batch operation will display a batch processing window, as shown below:



Batch Processing Window

All supported sensors that are on the main Aqua4Plus sensor window will display in the batch processing window. Each sensor has a checkbox in front of it, allowing you to select which sensors will be part of the batch operation. All boxes are checked when the window opens. Select or deselect individual sensors by clicking the checkbox. You can also select all the sensors or deselect all the sensors by clicking the respective buttons at the top of the form.

The batch processing window displays sensor information for each sensor, including sensor type, sensor name, sensor address, and the number of files currently on the sensor. There is also a status column, which displays the progress and status of a batch operation, including any error messages that might be generated.

Starting Batch Logging

Batch Logging Configuration

To start new logging on a group of sensors, select Batch Operations from the Logging menu, and then click on Set Up New Batch Logging. The following schedule window will display.

Batch Logging Configuration

File Name: Overnight

☒ Delayed Start01-Apr-2015 11:39:20☒ Set Sensor Clocks

Phase	Logging Interval dd/hh:mm:ss	# Records	Phase Duration dd/hh:mm:ss
1	00/00:01:00	100	00/01:39:00
2	00/00:30:00	50	01/01:00:00
3	00/01:00:00	100	04/04:00:00
4			

Select Sensors

Open

Save As

Clear

Delete

Logging Duration: 05/06:39:00

Batch Logging Configuration Window

You can load and modify a saved schedule or create a new one. If you want to open a previously saved schedule, Click the Open button, and then navigate to the saved schedule.

File Name: Enter a name for your configuration. This name will be part of the final file name - see details on file naming in the Retrieving Batch Data section below.

Delayed Start: If you want all your sensors to start at exactly the same time, enter a delayed start time here. Be sure to select a time far enough in the future to allow the configuration information to be broadcast to all sensors prior to that time. With directly connected sensors, this time need not be more than a minute or two. An error message will display if the schedule is not sent to all the sensors before the set delayed start time.

Set Sensor Clocks: Checkmark this box if you want Aqua4Plus to reset the clocks on all the sensors prior to starting to log. (The clocks will be set to the time on the computer running Aqua4Plus. This is recommended so that your collection times will match from one sensor to another.)

Phase Information: Describe your collection intervals and number of records, as desired. (Note: If using a continuous interval, see note on Continuous Polling Interval.)

Save As: If you want to save this schedule to disk before loading to the sensors, click the Save As button now.

Select Sensors: Once you have defined your schedule, click the Select Sensors button. This window will close and the batch logging start window will display, as shown below.

Continuous Polling Interval

When using batch processing, the goal is to have each sensor record for the same amount of time, with each phase lasting the same length of time from one sensor to the next. This makes it easy to compare data from various different sensors.

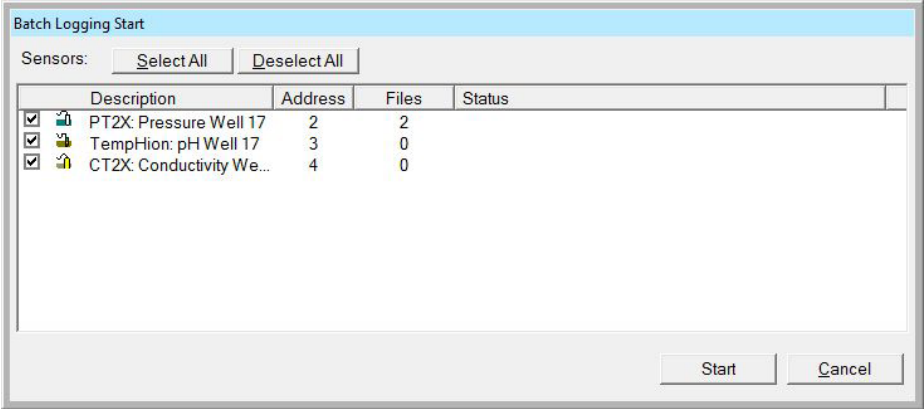
Most Seametrics Smart Sensors can be set to a continuous polling interval. This interval varies from sensor to sensor and can be set on any particular sensor by selecting the Sensor Continuous Rate under the Configure menu.

Due to the fact that sensors may have different continuous rates, if you want to set a phase to be continuous in batch mode, you will need to specify the phase duration for that phase, rather than specifying how many records will be recorded during that phase. The minimum phase duration is 10 seconds.

To indicate that a phase is a continuous phase, enter a letter C in the polling interval. The phase information will display as follows:

Phase	Polling Interval dd/hh:mm:ss	# Records	Phase Duration dd/hh:mm:ss
1	Continuous	TBD	00/01:00:00

Enter the Phase Duration as dd/hh:mm:ss. When the schedule is sent to the sensor during the starting process, the program will determine the correct number of records for that sensor to record to match the phase duration you have set.



Batch Logging Start Window

Be sure the sensors on which you want to start logging are selected, and then click the OK button. When you click OK, several things happen.

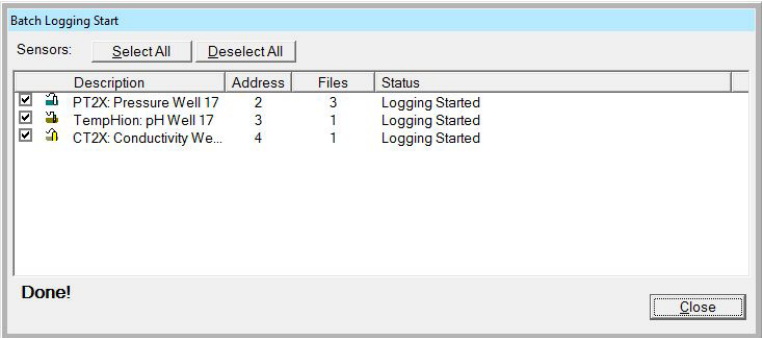
- Current status is gathered from each sensor.
- Available memory space is checked on each sensor.
- The clocks are reset (if so specified in schedule).
- The schedule information is sent to each sensor.
- The Start command is issued to each sensor.

Progress information for each sensor will be listed in the status column and overall progress information will be shown in bold lettering at the lower left of the window.

Notes:

- If you checked the Set Sensor Clocks option in the schedule, all sensor clocks will be set to the current time on the computer running Aqua4Plus just before logging is started. All clocks will be set at the top of a second.
- If you selected a delayed start time, all schedules will be sent to the sensors and logging will start at the appointed time. If the appointed time has passed before all the schedules have been loaded to the sensors, an error will be generated. See Error Reporting on next page.
- If you did not select a delayed start time, each sensor will be started in turn at the top of the next second. When directly connected this may result in each sensor starting one second after the previous one. If it is important that logging start at the same time, you must use the delayed start feature.

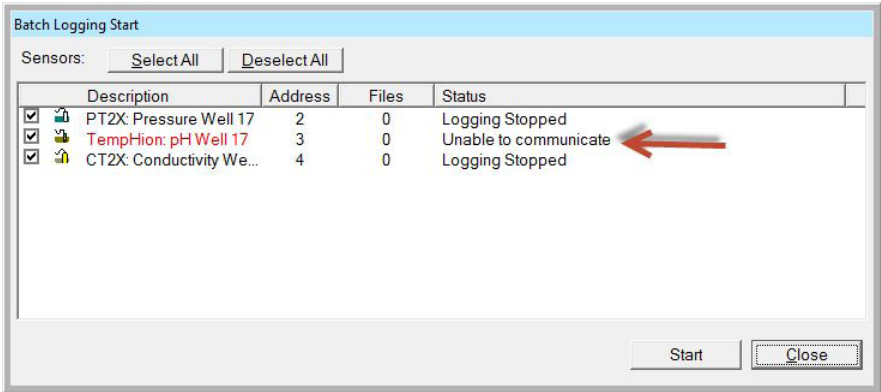
When the operation is finished, the status column will display the result of the operation for each sensor. If logging started successfully, the status column will say Logging Started, and the number of files on the sensors will be updated. Click the Close button to exit the batch processing window.



Logging Succesfully Started

Error Reporting

If any error occurred during the operation, a message box will display at the end of the operation. Also, the affected sensor will display in red and an error message will display in the status column. If you want to try again, select the desired sensors, and then click the OK button; if not, click the Cancel button.



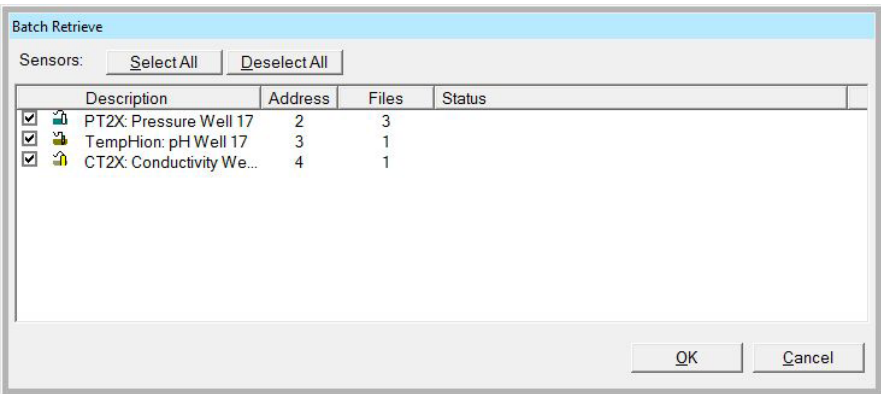
Error in Starting Logging

Retrieving Batch Data

The batch retrieve operation retrieves the **last file** on each sensor that is selected in the batch processing window.

To retrieve data from a group of sensors, select Batch Operations from the Logging menu, and then click on Retrieve Batch Data.

The following batch processing window will display.



Batch Retrieve Window

Be sure the sensors from which you want to retrieve data are selected, and then click the OK button.

You will be asked to select a file folder in which to save your files. The default is the folder you have selected as your default data folder under the Options menu.

As the files are retrieved, they are named as follows:

sensorname_filename_serialnumber.a4d

where:

- sensorname = the name you have given to the sensor with the Sensor Description option under the Configure menu.
- filename = the name of the file being retrieved
- serialnumber = the serial number of the sensor from which the data is being retrieved.

For example, if you were retrieving a file named Overnight from the three sensors selected in the example above, your three files would be:

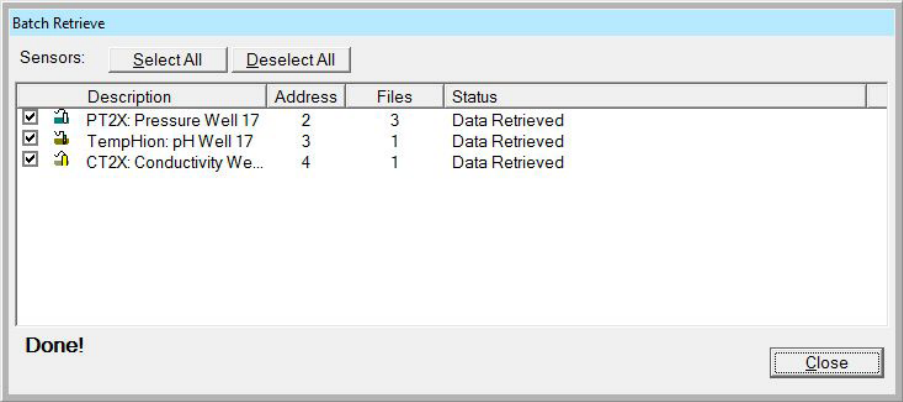
Pressure Well 17_Overnight_2901013.a4d
pH Well 17_Overnight_2902054.a4d
Conductivity Well 17_Overnight_2903021.a4d

If there is a file on the disk with the same name as the one you are trying to retrieve, Aqua4Plus will check to see if it is actually an earlier version of the exact same file. If it is, then Aqua4Plus will retrieve only those records since that previous retrieval and append them to the end of the file. If the file is different, then an error will be generated, and that file will not be retrieved so as not to overwrite any existing data on your computer.

Progress information for each sensor will be listed in the status column and overall progress information will be shown in bold lettering at the lower left of the window.

When the operation is finished, the status column will display the result of the operation for each sensor. If the data was retrieved successfully, the status column will say Data Retrieved.

Logging is not stopped nor are files erased during a retrieval operation. Click the Close button to exit the batch processing window.



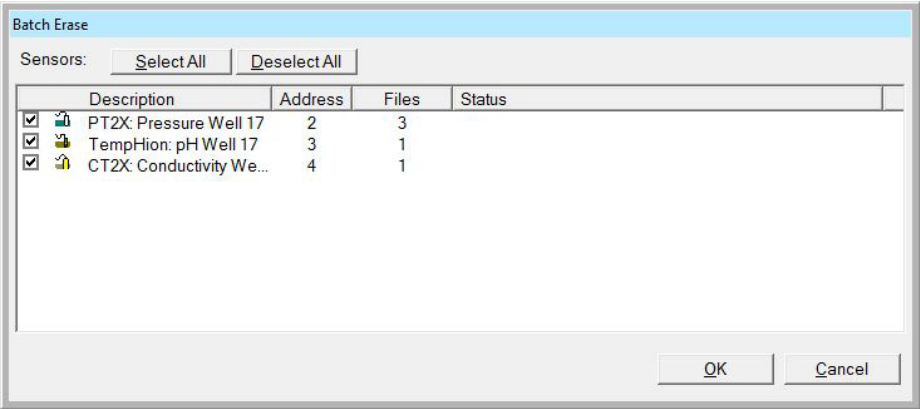
Data Successfully Retrieved

If any error occurred during the operation, a message box will display at the end of the operation. Also, the affected sensor will display in red and an error message will display in the status column. If you want to try again, select the desired sensors, and then click the OK button; if not, click the Cancel button.

Erasing Data

To erase data from a group of sensors, select Batch Operations from the Logging menu, and then click on Batch Erase Data.

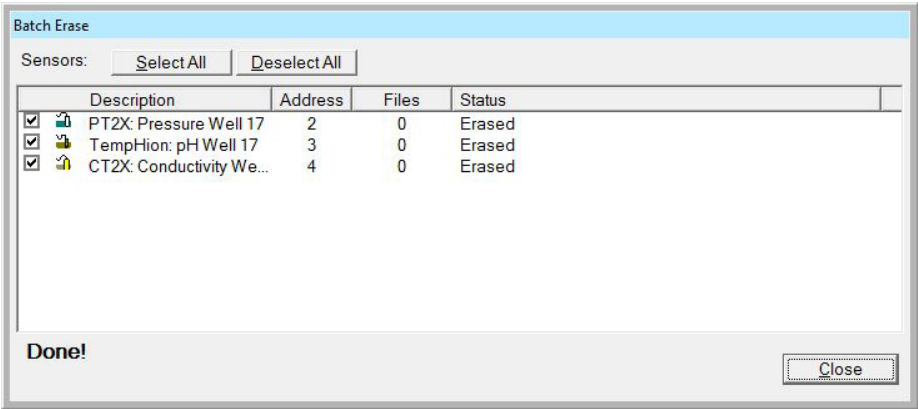
The following batch processing window will display. Be sure the sensors you want to erase are selected, and then click the OK button.



Batch Erase Window

Progress information for each sensor will be listed in the status column and overall progress information will be shown in bold lettering at the lower left of the window.

When the operation is finished, the status column will display the result of the operation for each sensor. If the data erased successfully, the status column will say Erased, and then number of files on the sensors will display as zero. Click the Close button to exit the batch processing window.



Data Successfully Erased

If any error occurred during the operation, a message box will display at the end of the operation. Also, the affected sensor will display in red and an error message will display in the status column. If you want to try again, select the desired sensors, and then click the OK button; if not, click the Cancel button.

Appendix D: Event Logging

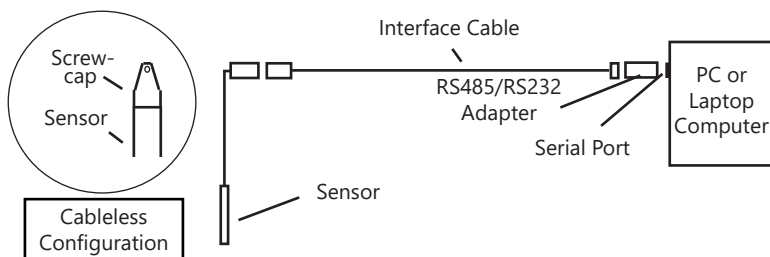
The AquiStar PT2X has an additional type of logging available and that is Event Logging. When running Event logging, the sensor scans on a specified schedule. These scans are not recorded. Each scan is compared to the prior scan, and if the difference between these is greater than a specified amount, a record is recorded. This is considered to be an event. Even without events, a record will be recorded every xx scans, based on what is defined in the setup. The logging will stop after the Logging Duration or when the sensor runs out of memory, whichever is first. If you want to use Event Logging on your PT2X, please contact Seametrics or refer to the application note *Event Processing on AquiStar Smart Sensors*, available at: www.seametrics.com

Appendix E: Alternate Connection Options

Seametrics recommends connecting the sensor to your computer using the Seametrics USB cable. However, when using Aqua4Plus, the sensor can also be connected using an RS232 serial port or a USB-to-Serial cable, as described below. (Note: Aqua4Plus Lite can only communicate using the Seametrics USB cable.)

Connecting via RS232 Serial Port


In its cabled configuration, the sensor cable is terminated with a weather-resistant connector. In its cableless configuration, the sensor is terminated with a weather-resistant connector inside a screw-cap. Connect the weather-resistant connector to your computer's serial port as shown below.



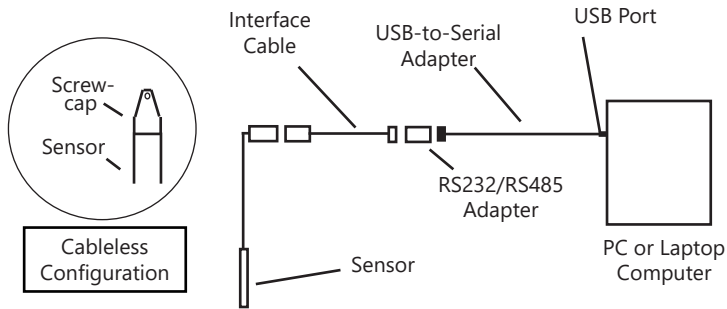
Connect the sensor to your computer using an RS485/RS232 adapter and an interface cable.

Connecting with a USB/Serial Adapter

USB-to-Serial cables are readily available from many electronics and computer stores, as well as numerous sites on the Internet. Seametrics has tested and recommends the Keyspan USA-19HS. It is available from Seametrics as well as from many sites on the Internet. Install as follows:

- Plug into USB port.
- Install the drivers provided with the particular unit.
- Determine the port number to which the adapter is assigned.
 - Right-click on My Computer.
 - From the popup menu, select Manage to open the Computer Management window.
 - On left panel, click on Device Manager.
 - On right panel, double-click on Ports.
 - A list of active COM ports will be displayed. Note the COM number assigned to the adapter you just installed.
For example:  Keyspan USB Serial Port (COM4)
 - Close Manager.
- Connect to the sensor.

- On the Aqua4Plus software, select the COM port noted above. (If you do not see your new COM port in the dropdown box, open the Communications dialog box from the Options menu. Increase the Highest COM port number, up to a maximum of 15.)



Connect the sensor to your computer using a USB to Serial adapter and an interface cable.

Appendix F: Regional Considerations

Window's regional settings control such things as how dates are formatted and whether a comma or a period is used as a decimal symbol.

Date Formats

Aqua4Plus does not use the regional settings when displaying dates. All dates are displayed as d-mmm-yy, for example, 8-Oct-14. This applies to all Aqua4Plus windows and to the exported .csv file. If you open the .csv file in Excel or export in the Excel format, dates may be formatted differently, depending on the settings in Excel.

Comma vs. Period

In the United States, a period is used, for example, 12,458. In some countries, a comma is used, for example, 12.458. If your computer is set to use the comma, then the Settings and Calibration fields in Aqua4Plus will truncate anything after the comma. To work around this, you will need to change the Decimal symbol and Digit grouping symbol setting in Windows. You should only have to do this during calibration and can change back to your normal settings after calibration is complete.

To change these settings:

- Access the Regional and Language settings from Control Panel.
- On Windows 7, click the Additional Settings button; on XP, click the Customize button.
- Click the Numbers tab.
- Change the settings as shown below, and then click Apply.

Numbers | Currency | Time | Date

Example
Positive: 123,456,789.00 Negative: -123,456,789.00

Decimal symbol: .

No. of digits after decimal: 2

Digit grouping symbol: ,

Digit grouping: 123,456,789

Before changing Settings and Calibration values, select a period as the decimal symbol and a comma as the digital grouping symbol. After you are done changing the Settings and Calibration values, you can return these settings to your normal settings.

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SOFTWARE LICENSE. The seller grants the user a non-exclusive license to use Aqua4Plus (hereafter known as the software), according to the following limitations and conditions.

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Seller's obligations under this warranty shall not apply to any product with (a) is normally consumed in operation, or (b) has a normal life inherently shorter than the warranty period stated herein.

In the event that equipment is altered or repaired by the Buyer without prior written approval by the Seller, all warranties are void. Equipment and accessories not manufactured by the Seller are warranted only to the extent of and by the original manufacturer's warranty.

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