

Water Quality Monitor

WQM

Host Software User's Guide

The user's guide is an evolving document. If you find sections that are unclear, or missing information, please let us know. Please check our website periodically for updates.

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1. WQM Setup and Operation

The WQM is factory-configured to run out-of-the-box. This user's guide explains the Host program for the WQM. For hardware setup and operation, refer to the associated user's guide.

- 1. Install and start the WQM host software on host computer.
- 2. Connect the WQM to the host PC and a 12 V nominal power supply using the test cable. Turn the power supply on. Select the appropriate COM port and baud rate (19200).
- 3. The WQM will cycle through the DO Stabilization Mode, then move to Sample Mode. When sampling:
 - WQM output in air will be a line of data every 6–10 seconds.
 - WQM output in water will be a line of data every second.
- 4. Collect a few minutes of data:
 - *Optional*: Select Save WQM Output on PC to save raw data (*filename*.raw) to a file location of your choice.
 - Make sure the Internal Logging checkbox in the Setup tab is On.
 - Data will be saved as .raw files to both the PC and the WQM.
- 5. After approximately 30 seconds, the FLNTU Bio-wiper[™] will open and the WQM will start transmitting data using the default output format. Data will plot in the View Data tab (below), or you can view raw data in the Scroll Data tab. Current values for each parameter will display to the right of the plot if the Show Plot Legend is checked, as well as to the left, in the WQM Data area. Either or both can be hidden or displayed.

COM Port Setup	View Data Scroll Data WQM Setup Output Controls WQM Files	
	WQM-0006	
		 Temperature(C) 19.9 Splinity (PSU) 0.127
Plot WQM SN 6.000		— DO (ml/l) 5.91 — Chlorophyll(ug/l) 198
		— NTU 16.4
Image: Salinity (PSD) 0.127 Image: DO (ml/l) 5.911		
Chlorophyll(ug/l) 198.00		
IV 10 10.300	140 -	
	120 -	

- 6. Allow the meter to run for a few minutes, then Select Stop WQM Sample and Stop Saving Output Data. The Bio-wiper[™] will close. Data will stop scrolling.
- 7. The WQM will enter Standby Mode, allowing you to communicate with the meter.
- 8. To view and change the WQM settings, select the WQM Setup tab, then Get WQM Setup. The WQM settings will appear in the Current Setup area.



Н	mm/dd/yy hh:mm:ss	Start WQM Sample	-₩QM Sta	tus In Standby		Save W
W	QM: 09/18/07 13:01:33	Stop WQM Sample				Get Status Stop Sa
сом	Port Setup	View Data Scroll Data	WQM Setup .	/QM Files		
C0	M 1	Get V	VQM Setup	Send New Setup	Show Hints	Set Date and Time
1194	200	Setup Parameters	Current Setup	New Setup		
WQM	1 Data 🛛 🔀	WQM Control:	Autonomous	 Autonomous C External 		Increment WQM Run Number
Plot	WQM SN Temperature(C)	Internal Logging:	On	🔽 On		Show DO Stable vs. Temp. Plot
•	Pressure (dbar)	Sample For:	01:57:00	01:57:00 🔹 💽 🕨		
•	Salinity (PSU)	Interval Time:	02:00:00	02:00:00		Print Setup
•	OxSat (???)	Sample Delay:	00:00:00	N/A Under Autonmous Control	⊢"New Setup' Powe	r Consumption
•	D0 (ml/l)	D0 Stabilizaton:	30-120 Secs	Set by WQM: 30-120 Seconds	Minimum Expected Temperature: 22 0	Estimated Power
2	Chlorophyll(ug/l)	BLIS Operation:	On	🔽 On		2.465 AH / Day
		Purge After 1st Sample:	No	Yes		
		BLIS Interval:	1 Hours	1 Hours	Deployment Days	74.0 AH for 30 Days
		Injection Volume:	28.0 ul	▲ ▶ 28 ul		
		BLIS Volume Used:	2.86 ml		-Internal Disk Store	ee
		Est. BLIS Deployment:	218 Days Left	218 Days Remaining	File No: 370	694 K Glitches: 5
		Free Disk: 962008 K	145 Days	145 Days	Free: 962008 K Used: 38632 K Total: 1000640	Lost Power: 3

- 9. Select Get Directory in the WQM Files tab. A list of .raw files stored on the WQM appears.
- 10. Select the Select Download Folder to set up a place on the host for the files.
- 11. Select Download WQM Files. They will save into the folder set up in the previous step.

Note that if you want to change the parameters the host will process, do so using the Advanced File Processing option. See Section 2.7 for details.

View Data Scroll	Data WQM Setup WQM File	s		
	WOM Directory			
WOM0006 329	1 524 09.17.07 1·10P	7	Get WOM Directory	Select Download Folder
W0M0006.330	4 547 09-17-07 1-16P	-		
W0M0006.331	4.549 09-17-07 1:18P			
WQM0006.332	1,130 09-17-07 1:28P		Download WOM Files	Frase WOM Files
WQM0006.333	4,555 09-17-07 1:52P		Dominodu m din T lies	Eluse weint lies
WQM0006.334	4,551 09-17-07 1:59P			
WQM0006.335	4,499 09-17-07 2:07P		Y C 15 1 1	Advanced City Descention
WQM0006.336	4,561 09-17-07 2:14P		👗 Lancel Download	Advanced File Processing
WQM0006.337	38,239 09-17-07 2:42P			
WQM0006.338	30,122 09-17-07 3:05P		Download File Status:	
WUM0006.339	4,396 U9-17-07 3:10P		Download The Status.	
WUM0006.340	732 09-17-07 3:14P		Folder: C:\Documents and S	ettings\Heidi\Desktop
WUM0006.341	2,007 09-17-07 3:30P			
WQM0006.342	10.101.00.17.07.4.100		File:	
WQM0006.343	5 104 09 17 07 4 12P		Download File Size: 0 K	
WQM0006.344	100 440 00 17 07 5:07D		Download The Size. OK	
W0M0006.345	22 928 09.17.07 5.48P			
W0M0006 347	6.611 09.17.07 5:58P			
W0M0006 348	1 599 09-17-07 6:05P			
W0M0006 349	212 734 09-17-07 10:33P			
WQM0006.350	287.531 09-18-07 12:11A			
W0M0006.351	73.770 09-18-07 12:51A			
W0M0006.352	1.018 09-18-07 12:58A			
WQM0006.353	0 09-18-07 1:00A			
WQM0006.354	367 09-18-07 1:04A			
WQM0006.355	461 09-18-07 1:05A			
WQM0006.356	1,549,350 09-18-07 9:44A			
WQM0006.357	2,151 09-18-07 9:54A			
WQM0006.358	3,555 09-18-07 10:01A			
WQM0006.359	1,486 09-18-07 10:20A			
WUM0006.360	367 U9-18-U7 10:21A			
WUM0006.361	2,432 U9-18-07 10:24A			
WUMUUU6.362	24,844 09-18-07 10:39A			
WUM0006.363	5,330 09-18-07 10:48A			
WQM0006.364	267 09.19.07 10.404			
W0M0000.303	10 212 09 19 07 10 564			
W0M0006.367	5 573 09-18-07 11:014			
WQM0006.368	8.129 09-18-07 11:064			
WQM0006.369	10.216 09 18 07 11:11A			
WQM0006.370	52,444 09-18-07 11:35A			
WQM0006.371	23,566 09-18-07 1:11P			
WQM0006.372	20,197 09-18-07 1:18P			
WQM0006.373	3,112 09-18-07 1:23P	-		
		1		

12. Turn off the power supply.

13. View the .raw files in MS Excel or a text editor.



2. Technical Reference

This section provides details on the controls and options available in the host software.

2.1	Menus
-----	-------

File Show Pre-Deployment Advanced Help

File

Exit: Exits the host program.

Show

COM Port Setup	
COM Port Setup	×
COM 1	•
19200	•

Selecting this will open the COM Port Setup box, which allows you to select the COM port and baud rate (19200) for Host PC–WQM communication. If the box is already open, this menu will be inactive.

Data Sidebar

-wum	l Data	×
<u>Plot</u>	WQM SN	6.000
	Temperature(C)	19.843
	Pressure (dbar)	0.030
	Salinity (PSU)	0.127
	OxSat (???)	6.367
	DO (ml/l)	5.982
	Chlorophyll(ug/l)	198.00
	NTU	16.452

Note that this display can be toggled using Advanced > Show WQM Data. These are the meter's default measurement settings. Checking the Plot box will cause each checked parameter to display in the View Data window. Values in the boxes to the right are the current values for each parameter, which is also displayed graphically in the View Data tab.

View Data Setup

View Data Setup	
X-Axis Setup X-AxisSetup	Background Color
Y-Axis Setup Auto Scale	Show Plot Legend C No C Yes
C Plot Between Min = 0 and Max = 35	Show Plot Tool Bar No O Yes

Displays or hides the legend and toolbar and changes background color on plot in the View Data tab.



Pre-Deployment

Clear BLIS Volume Used

Provides guidance on filling the BLIS reservoir (see Hardware User's Guide for details). The BLIS Volume Used is a running total of bleach used during a deployment. It should be reset prior to a new deployment.

Clea	ar the BLIS Volume Used Record	_
	The WQM records how much bleach the BLIS (Bleach Injection System) uses during the course of a deployment.	
	Prior to each WQM deployment, the user should empty and then re-fill the BLIS resevoir with 150 ml of fresh bleach (not to exceed 5 %) and the 'BLIS Volume Used' should be reset to 0.0 ml.	
	By resetting the 'BLIS Volume Used', the user will be able track the amount of bleach that is or was used during the course of the deployment.	
	Chlorine in the bleach is extremely reactive and is rapidly depleted once a bleach container is opened. You should ALWAYS use fresh bleach to ensure the BLIS provides it's maximin the Anti-Bio Fouling capability.	
	BLIS Volume Used: 3.43	
	Press OK to Reset the WOM's BLIS Usage Volume to 0.0 ml.	
	Press Cancel to Close This Window Without Reseting the BLIS Volume Used.	
	Cancel	

Clear Power Failure Message

If power to the WQM is interrupted, a red warning box will appear, and the UPS Status box on the WQM Setup screen will be also go red. Select Clear Power Failure Message to clear the warning box and reset the red background on the UPS Status.

Increment File

Allows you to start another file run #. Used with External control.

Reset Pressure Offset

Provides guidance on filling the resetting the pressure offset, and allows you to reset the volume used to 0.0 for a new deployment.

Reset the WQM Pressure Offset
The Pressure Sensor in the WQM may be adjusted to account for atmospheric and altitude pressure differences prior to deployment.
While the WQM cannot adjust for atmospheric pressure changes during the course of a deployment, starting a deployment with the WQM pressure set to sealevel will simplify post deployment adjustments.
The procedure for Resetting the WQM Pressure Offset is:
 Locate the WQM just above the surface at/near the deployment location. Provide power to the WQM and press the Stop button on the Host program. Once the WQM status is showing STANDBY, press the OK button below. Wait for 2 minutes while the WQM adjusts its pressure calibration to the current atmospheric pressure and altitude. Once the WQM status has returned to STANDBY, restart the WQM and verify that the pressure measurement is 0.00 dbar, +/- 0.01 dbar. Stop the WQM and proceed with the planned deployment.
Press OK to Reset the WQM pressure measurment to 0.00 dbar
Press Cancel to Close This Window Without Reseting the WQM Pressure Offset.
✓ OK Cancel



Advanced

Change WQM Output

WQM Output Configuration			
VQM Header	▼ Temperature (C)	🔲 DO (mg/l)	🔽 NTU
🔽 WQM SN	🔽 Pressure (dbar)	D0 (mmol/m3)	🔲 Beta
🖂 WQM State	🔽 Salinity (PSU)	🔲 % Oxygen Saturation	🔲 RHO (kg/m^3)
🔽 Date	🥅 Raw DO (Hz)	🗖 Baw Chlorophyll	🔲 Sigma-t (kg/m^3)
🔽 Time	C Oxygen Saturation		C Sound Velocity
Conductivity (mmho)	🔽 DO (ml/l)	🔲 Raw Turbidity	🔲 Check Sum
Reset Default Outputs	Get Output Configu	ration Send Outp	put Configuration

The parameters selected here are the default, or minimum output. Others can be selected and will appear above in the WQM Output Configuration area, in the Scroll Data tab, and in the View Data tab.

- Reset Default Outputs: Resets output to factory settings.
- Get Output Configuration: Retrieves the meter's output settings.
- Send Output Configuration: Sends any new selections to the WQM. The additionally selected parameters appear on the left in the WQM Data area and in the plot legend on the View Data tab.

For example:

With the desired parameters selected, select Stop WQM Sample to put the WQM in standby mode.

Select Send Output Configuration. The WQM is updated and the changes are reflected in the WQM Data area, as well as the data plot legend.

-WQM Data 🛛 🗙					
<u>Plot</u>	WQM SN	6.000			
	Conduct (mmho)	0.024			
	Temperature(C)	19.856			
	Pressure (dbar)	0.030			
	Salinity (PSU)	0.127			
	Raw DO (Hz)	10213.			
	DO (ml/l)	5.995			
	D0 (mg/l)	8.518			
	Raw CHL	70.000			
	Chlorophyll(ug/l)	202.50			
	Raw Turbidity	2743.0			
	NTU	16.224			

	Conduct (mmho)	0.0237
	Temperature(C)	19.9
	Pressure (dbar)	0.0300
	Salinity (PSU)	0.127
	Raw DO (Hz)	10172
	DO (ml/l)	5.96
	DO (mg/l)	8.47
	Raw CHL	70.0
	Chlorophyll(ug/l)	203
	Raw Turbidity	2741
	NTU	16.2



Change Chlorophyll Coefficients

	Chlorophyll Co	efficier	its		
l				Heer Ch	ractorization
l		Factor	y Calibration	<u>Current</u>	New
l	Scale Fa	actor:	1.0	1.0	0.410
l	Offset:		0	0	35
]	Send	Get Current I New User Co	Coefficients efficients to	WQM
		R	eset To Facto	ory Coefficie	nts

Application-specific characterization coefficients can be input and loaded here. To retrieve the factory defaults, select Reset to Factory Coefficients.

Show Stop WQM Window

Provides the option of stopping WQM data acquisition.

🆺 Do you want to Stop WQM data collection? 📃 🗖 🔀				
Γ	Yes, Stop WQM Sampling Next Time Skip This Page an	X No, Continue	Sampling QM Sampling	

Help

See Section 4 for troubleshooting using Help screen options and descriptions.

2.2 Status Indicators Date and Time

	mm/dd/yy hh:mm:ss	Disj
Host	09/19/07 06:13:04	1 his
WQM:	09/19/07 06:12:52	betv

Displays the date and time of both the host PC and the WQM. This box will have a red background if the time difference between the WQM and the host PC.

WQM Status WQM State:	Displays DO Stabilization, Sample, and Standby operations.
0%	

WQM Data

Start WQM Sample

The WQM will begin sampling.



If the WQM is in a low power state when the green Start WQM Sample button is pressed, The window at the right will appear, providing the option of starting the WQM immediately, or at a date and time of your selection. The WQM Status will report and decrement the time the WQM will sit at low power before starting.

<mark> IL</mark> Start WQM Sample Sequence	
	Start WQM Now
Start WQM in	0 Hours 12 Minutes and 9 Seconds
✓ January, 2008 →	Start Sample @ 11:35 on 01/24/2008
Sun Mon Tue Wed Thu Fin Sat 30 31 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 C1 22 23 30 31 1 2 24 24 30 31 1 2 3 4 5 6 7 8 9 C1 728 24 30 31 1 2 3 4 5 6 7 8 9 C1 70 8 7 8 9 20 1 12 1 12 1 12 1 10 1 12 1 15 <	Set Time of Day 4

Get Status	Forces the WQM to update the data output display.
Save WQM Output on PC	Saves real-time data to the host PC.
Stop Saving Output Data	Stops saving data to PC.
Stop WQM Sample	Stops WQM and places it in Standby Mode.

2.3 WQM Setup

The default operating parameters of the WQM are factory-set, but can be changed:

Get WQN	1 Setup	Send New Setup	Set Date and Time	Save Setup
Setup Parameters WQM Control:	Current Setup Unknown	New Setup	Show DO Stable vs. Temp. F	Plot Load Setup
Sample For: Interval Time: Sample Delay: DO Stabilizaton:	00:00:00 00:00:00 00:00:00 00:00:00	00:00:10 00:03:00 N/A Under Autonmous Control Set by WQM: 30-120 Seconds	New Setup' Power Consumpt Minimum Expected Estin Temperature: 22 C Cons 0.43	ion nated Power sumption @ 12 V: 5 AH / Day
BLIS Operation: Purge When Submerged: BLIS Interval:	Unknown Unknown Unknown	I⊄ On I⊄ Yes <mark>1 Hours</mark>	Deployment Days	AH for 30 Days
Injection Volume: BLIS Volume Used: Est. BLIS Deployment: Free Disk: 0 K	Unknown Unknown Unknown -0 Days	223 Days Remaining 0 Days	Increment File # Internal Disk Storage File #: Free Used: Total:	UPS Status Normal Interval <u>UPS Activations</u> Current: 0 Tath 0





2.3.1 Setup Parameter: WQM Control

Autonomous (factory default setting)

Setup Parameters	Current Setup	New Setup
WQM Control:	Autonomous	 Autonomous C External
Internal Logging:	On	🔽 On
Sample For:	00:02:00	00:02:00
Interval Time:	02:00:00	02:00:00
Sample Delay:	00:00:00	N/A Under Autonmous Control
DO Stabilizaton:	30-120 Secs	Set by WQM: 30-120 Seconds

The WQM is connected to a constant power source and is self-directed. It uses an internally stored setup to determine when to sample, log, and sleep. Data filenames will increment upon power up and append when the meter is cycling between low power and sampling.

Note that when you change sampling parameters, the host software automatically recalculates memory and power consumption.

External

Setup Parameters		New Setup
occup r drameters	canoni octup	nem octup
WQM Control:	Autonomous	O Autonomous 💿 External
Internal Logging:	On	🔽 On
Sample For:	00:02:00	00:02:00
Interval Time:	02:00:00	N/A - Under External Control
Sample Delay:	00:00:00	00:00:00
DO Stabilizaton:	30-120 Secs	00:00:43

WQM data is synchronized with data from other instrumentation when using an external controller or logger. External power is switched on to the WQM at the start of the sample interval and a stop command is sent to the WQM at the end of the sample interval before external power is turned off.

Note that when you change sampling parameters, the host software automatically recalculates memory and power consumption.



2.3.2 Internal Logging

Enables or disables data being saved internally to the WQM.

2.3.3 Sample For and Interval Time

When Autonomous is checked, the sample duration is selectable from 10 seconds to 2 hours. The Interval Time ranges from 3 minutes to 24 hours. The interval is inclusive: for example, setting the interval to 2 hours and the sample for time to 15 minutes, the WQM will sample once for 15 minutes every 2 hours.

Interval Time is not applicable when External is checked

2.3.4 Sample Delay

Sample Delay is not applicable when Autonomous is checked. Under External control, sampling can be delayed for up to 1 hour once the WQM recovers power.

2.3.5 DO Stabilization

Autonomous Control: DO Stabilization is controlled by the WQM, depending on temperature. Stabilization takes less time in warm water (closer to 30 seconds) than in cold water (closer to 120 seconds).

External Control: DO stabilization time can be set from 30 seconds to 2 minutes. For external control, you must take into account the temperature of the water the WQM will be used in.



2.3.6 BLIS Operation

The BLIS system can be set to inject from $7-700\mu$ l of bleach at 1 hour intervals, and to purge after taking the first sample. Note that the Est. BLIS Deployment time will automatically update in response to the volume and interval selections.



2.3.7 Free Disk

Provides an estimate of available memory.	[Internal Disk Storage	UPS Status
See Internal Disk Storage area to the		File No: 375 7584 K	Glitches: 5
right for details.		Free: 955047 K	Lost Power: 3
C		Used: 45593 K	
		Total: 1000640 K	

3.8 Set Date and Time

Press to synchronize the WQM and the host computer's date and time. The WQM must be in Standby mode.

2.3.9 Increment WQM Run Number

Allows you to create a new file. This is used when the control is set to External to increment the run# between deployments.

2.3.10 DO Stable vs. Temp. Plot

Allows you to estimate and set the time needed for DO sensor stabilization for a given water temperature. This option is available only in External (not Autonomous) mode.

2.3.11 Save Setup File

Opens a window so a text file of meter settings can be saved or printed.

2.4 View Data

Allows real-time viewing of selected parameters from the WQM Data area (left side of window) or the View Data Setup (see below). Plotted parameters can be changed on-the-fly.





View Data Scroll Data WQM Setup Output Controls WQM Files Advanced File Processing Chlorophyll Coef

Select Advanced menu, then Show Output Controls (right). With the meter in Standby, select or deselect parameters, then select Send Output Configuration to the WQM.

Sample Output			
SN,Cond,Temp,RawDO,DO,CHL			
WQM Output Configuration			
VQM Header	🔽 Temperature (C)	🗖 DO (mg/l)	🔽 NTU
VQM SN	Pressure (dbar)	🗖 DO (mmol/m3)	🗖 Beta
🗖 WQM State	🔽 Salinity (PSU)	🔲 % Oxygen Saturation	🔲 RHO (kg/m^3)
🔽 Date	🔲 Raw DO (Hz)	Raw Chlorophyll	🔲 Sigma-t (kg/m^3)
🔽 Time	Oxygen Saturation		Sound Velocity
Conductivity (mmho)	🔽 DO (ml/l)	Raw Turbidity	🗖 Check Sum
Reset Default Outputs	Get Output Configu	Iration Send Out	put Configuration

The new parameters will be displayed in the WQM Data area and the legend. Either or both can be hidden or displayed. Both show current output values for each parameter.

2.5 Scroll Data

Allows you to view real-time raw data according to the parameters selected in the Output Controls tab of the host program.

WQM,6,091907,084108,19.8197,0.03,0.127,6.370,6.001,202.500,16.254 WQM,6,091907,084109,19.8190,0.03,0.127,6.370,6.001,207.000,16.248 WQM,6,091907,084110,19.8185,0.03,0.127,6.370,6.000,198.000,16.248 WQM,6,091907,084111,19.8174,0.03,0.127,6.370,6.001,198.000,16.248 WQM,6,091907,084112,19.8155,0.03,0.127,6.370,6.001,198.000,16.248 WQM,6,091907,084113,19.8172,0.03,0.127,6.370,5.999,207.000,16.248 WQM,6,091907,084114,19.8158,0.03,0.127,6.370,6.001,202.500,16.248 WQM,6,091907,084115,19.8197,0.03,0.127,6.370,6.001,202.500,16.248 WQM,6,091907,084115,19.8197,0.03,0.127,6.370,6.001,202.500,16.248 WQM,6,091907,084116,19.8217,0.03,0.127,6.370,6.001,202.500,16.248 WQM,6,091907,084117,19.8157,0.03,0.127,6.370,6.001,202.500,16.248



2.6 WQM Files

Options in this tab allow you to select the data files to be uploaded from the WQM to the host PC.

WQM Directory		
W0M0006.333 4.555 09-17-07 1:52	Get WQM Directory	Select Download Folder
WQM0006.334 4,551 09-17-07 1:59		
WQM0006.335 4,499 09-17-07 2:07	⁷ P	2
WQM0006.336 4,561 09-17-07 2:14	Download WQM Files	Erase WQM Files
WQM0006.337 38,233 03-17-07 2:4		······································
WQM0006.339 4.396 09-17-07 3:10		
WQM0006.340 732 09-17-07 3:14	P 🕺 👗 Cancel Download	Advanced File Processing
WQM0006.341 2,007 09-17-07 3:30)P	
WQM0006.342 763 09-17-07 3:31	P Download File Status: Comp	lete
WQM0006.343 19,161 09-17-07 4:1		
WQM0006.344 5,134 6517-67 4.10	Proider: L:\External Docs\W	ų M
WQM0006.346 22,928 09-17-07 5:4	8P Download File: WQM0006.37	6 as WQM0006_376.Raw
WQM0006.347 6,611 09-17-07 5:58	3P	
WQM0006.348 1,599 09-17-07 6:05	5P Download File Size: 8 K	
[WQM0006.349 212,734 09-17-07 10:	33P	
Get WQM Directory	Displays a list of files saved	on the WOM.
,	1 5	
		<u>1</u> (<u>C</u> 1
	Select one or more and allow	s you to manage data files.
	Opens a window to allow yo	u to select the location on the
	host PC to which the WOM'	s internal files will be saved
	nost i e to which the w Qivi	s internal mes will be saved.
	Cancels any download in pro	gress.
Salaat Download Falder	Drings up a window for you t	a calact or grants a folder in
Select Download Folder	Brings up a window for you t	o select of cleate a folder in
	which the .raw WQM files w	Ill be stored.
Download WOM Files	Savag the calacted raw files t	a the proviously selected
Download WQIVI FILES	Saves the selected haw thes t	o the previously selected
	download folder.	
	Calastad files will be delated	from the WOM moments
	Selected files will be deleted	from the wQM memory.
Cancel Download	Halts the process of saving r	aw files. The host will save all
Calleer Download		
	of any file being saved when	cancel is selected and any
	remaining, unsaved files will	remain selected but will not be
	saved	
	Jurou.	
Advanced File	After downloading (saving) f	iles to the host PC in the
Processing	WOM Files tab you can sele	ct various derived narameters
rioceanig		
	tor the WQM Host program t	o calculate as part of the
	processed file.	
	L ·	



DO Stabilization Optics Startup Valid Sample	C Space C Tab C Comma	Load File Configuration Save File Configuration Reset Default Configuration
WQM Processed File Setur VQM' Header SN Numeric State Text State Julian Date.Time Date Time Conductivity (mmho) Femperature (C) Pressure (dbar) Salinity (PSU) Raw D0 (Hz) D0 (ml/l) D0 (mg/l)	P DO (mmol/m3) Oxygen Saturation X Oxygen Saturation Raw Chlorophyll Chlorophyll Factory Coef V User Coef. Raw Turbidity NTU Beta RHO (kg/m^3) Sigma-t (kg/m^3) Sound Velocity	Process Raw WQM Files Done Configuration File: Default or None Raw WQM File: C:\External Docs\WQM\WQM0006_376.Raw Output File: C:\External Docs\WQM\WQM0006_376.DAT

Process Which Input Records DO Stabilization Optics Startup Valid Sample	Any data generated during warmup is suspect. Normally only stable, valid samples are processed. DO Stabilization and Optics Startup allows you to process data with questionable DO measurements
Oelimiter OSpace ⊙Tab OComma	Choose how the contents of the output file will be delimited.
Process Raw WQM Files	Selecting this button results in a window that allows you to select the .raw file you'd like to process, and then saves the processed file (.dat) to the same folder.
Load File Configuration	Loads previously saved parameter configurations to be calculated by the host program.
Save File Configuration	Saves configurations in the host program.
Reset Default Configuration	Returns the parameter configuration to the factory default settings (listed below).

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Default data displayed:	WQM Processed File Setup
 WQM Header WQM SN Date Time Temperature Pressure Salinity DO (mg/l) Chlorophyll (µg/l) NTU 	✓ 'WQM' Header □ DD (mmol/m3) ✓ SN □ 0xygen Saturation □ Numeric State □ % 0xygen Saturation □ Text State □ Raw Chlorophyll □ Julian Date. Time <u>Chlorophyll</u> ☑ Date □ Factory Coef ☑ Time ☑ User Coef.
Selections in this window do not change the data that's collected, merely the output: the host program calculates derived parameters from the raw data.	 Conductivity (mmho) Raw Turbidity ✓ Temperature (C) ✓ NTU ✓ Pressure (dbar) Beta ✓ Salinity (PSU) RHO (kg/m[^]3) ✓ Raw DO (Hz) ✓ Sigma-t (kg/m[^]3) ✓ DO (ml/l) ✓ Sound Velocity ✓ DO (mg/l)



3. WQM Data and Status Record Formats

When actively sampling, the WQM will output a line of data every 6–10 seconds in air, and a line of data once per second in water.

The WQM Status record is used to update the WQM Host program during normal WQM operations. This record will be sent 1 per second while the WQM is in Standby (waiting for commands) or starting the CT-DO and optical sensors when the WQM is immersed in water. This record will be sent once every 10 seconds while the WQM is sampling in air. When the WQM is immersed and is sampling, the status record will be sent periodically, typically when the file size has incremented.

3.1 Data Format

The WQM outputs data as a tab-delimited, ASCII, <CR><LF> terminated record. A valid WQM record looks like this:

WQM,005,082412,064534,0.01032,17.3677,0.04,0.060,11817.7,9.520,8.878,92,0.529,1035,6.237

Where

WQM SN, date (format), time (format), conductivity (units), temperature (units), pressure (units), salinity (units), raw dissolved oxygen measurement, oxygen saturation, dissolved oxygen measurement, raw chlorophyll, chlorophyll, raw turbidity, and turbidity.

When the WQM is first started, you may see several records that lack either the CTD or ECO component of the WQM record, or may have neither CTD or ECO component of the record. These records are normal as the WQM warms up and starts obtaining data.

A record without either CTD or ECO data will look like: WQM,005,082412,064435,,,,,,,

A record with ECO data but missing the CTD component is: WQM,005,082412,065146,,,,,90,0.504,1016,6.117

A record with CTD data but without ECO data will be: WQM,005,082412,065149,0.01032,17.4035,-0.04,0.060,10887.1,9.513,7.881,,,,,

If partial records are being transmitted by the WQM after the initial startup, see the user's guide or contact WET Labs to diagnose the meter malfunction.

3.1.1 Valid Data Parameters

The first 3 columns after the Date and Time are Temperature (C), Pressure (dbar), and Salinity (PSU).

Temperature	Environment-dependent
Pressure	in air: 0.5 to -0.5 dbar in water: approximately equal to the depth in meters.
Salinity	Calculated and varies based on conductivity, temperature, and pressure.



The next column is dissolved oxygen. **Dissolved Oxygen** 1–10 mg/l

3.2 Status Record Format

The contents of the WQM status record Version 1 is:

Header:	WETS WQM
WQM Serial Number	1-9999
Status Record Version	1
Month	1–12
Day	1–31
Year	07–99
Hour	0–23
Minute	0–59
Seconds	0–59
Control	0=Autonomous, 1=External
Mode	0=In air, 1=In-situ
Action	1–31: Defines action the WQM is working.
Countdown	1-second countdown for each action
Delay Time	Delay sample by X seconds while in External Mode
DO Stabilization Time	Time required to get a stable DO measurement
Sample Time	Sample for X seconds
Sample Interval	Interval between the start of consecutive samples.
Logging	Internally logging data: 0=No, 1=Yes
File Number	Data File Number
File Size	Size of current data file
Free Disk Space	KB of available WQM disk space
Total Disk Space	KB of total WQM disk space
Total BLIS Squirts	Number of times the BLIS pump has been cycled
BLIS Volume per Squirt	Volume in µl of one BLIS pump cycle
BLIS Hours	Number of hours between BLIS activations (always 1)
BLIS Squirts	Programmed number of squirts at each BLIS activation
BLIS Counter	Number of hours since the last BLIS activation
Purge	Number of BLIS squirts to purge the BLIS of air/water
Outbits	8 Hex ASCII bytes that define which data to output
Recent UPS	UPS was activated on last sample attempt
UPS Counter	Number of consecutive UPS activations
Total UPS Counter	Factory reset counter that totals all UPS activations
Power Status	1=Good Power, 0=Inadequate Power
Battery Voltage	0.0 indicates Not Available



4. Troubleshooting

When you select Troubleshooting under the Help menu, the tab below appears. Note that the meter must be in Standby use troubleshooting.

/iew Data Scroll Data WQM Setup WQM Files Sensor Troubleshooting		
Test WQM Components C BLIS Testing C Physical Sensors (CTPDO) C Optical Sensors (CHL - NTU) C Pump C Testing Complete		
Show WQM Device Calibrations		
Done w/Troubleshooting		
WQM,6,091907,091343,19.8305,0.03,0.127,6.368,6.000,202.500,16.290		
WQM,6,091907,091344,19.8289,0.03,0.127,6.369,6.002,198.000,16.266		
WQM,6,091907,091345,19.8338,0.03,0.127,6.368,6.002,189.000,16.254		
WQM,6,091907,091346,19.8290,0.03,0.127,6.369,6.002,184.500,16.260		
WQM,6,091907,091347,19.8299,0.03,0.127,6.368,6.002,184.500,16.278		
WQM,6,091907,091348,19.8301,0.03,0.127,6.368,6.002,211.500,16.290		
WQM,6,091907,091349,19.8320,0.03,0.127,6.368,6.002,202.500,16.278		
WQM,6,091907,091350,19.8323,0.03,0.127,6.368,6.002,202.500,16.272		
WQM,6,091907,091351,19.8319,0.03,0.127,6.368,6.002,202.500,16.266		
WQM,6,091907,091352,19.8321,0.03,0.127,6.368,6.002,198.000,16.260		
WQM,6,091907,091353,19.8316,0.03,0.127,6.368,6.002,193.500,16.260		
WQM,6,091907,091354,19.8325,0.03,0.127,6.368,6.001,211.500,16.302		
WQM,6,091907,091355,19.8329,0.03,0.127,6.368,6.001,207.000,16.266		
WQM,6,091907,091356,19.8316,0.03,0.127,6.368,6.001,193.500,16.266		
WQM,6,091907,091357,19.8322,0.03,0.127,6.368,6.000,202.500,16.266		
h		
Keyboard Entries	Send	Exit To Monitor

Selecting one of the buttons under **Test WQM Components** will activate additional options, described below.

4.1 BLIS Testing



- Display BLIS Status: Displays the current configuration settings on the BLIS meter.
- Pump BLIS Once: Allows you to check the functionality of the pump.
- Run 20 BLIS Pump Cycles: Runs the BLIS pump 20 times.



4.2 Physical Sensors

Test WQM Components	Physical Sensors Are Active
 BLIS Testing Physical Sensors (CTPDO) 	Display Status and Cal Coefficients
Optical Sensors (CHL - NTU) O Pump	Take One Sample
C Testing Complete	Start Continuous Pumped Sampling
Show WQM Device Calibrations	Start continuous r ampea sampling
Done w/Troubleshooting	Stop Continuous Pumped Sampling

- Display Status and Cal Coefficients: Current calibration coefficients are displayed.
- Take One Sample: Allows you to check the output displayed.
- Start/Stop Continuous Pumped Sampling: Allows you to check the functionality of the pump while sampling.

4.3 Optical Sensors



- Display Setup: Displays the current configuration settings on the FLNTU meter.
- Take One Sample: Allows you to check the output displayed.
- Close/Open Shutter: Allows you to check the functionality of the *Bio-wiper*.

4.4 Pump



WARNING! Make sure the WQM is in submerged before running the pump.

- Pump Fast/Pump Fast then Slow: Allows you to check the functionality of the pump.
- Pump Off: Turns the pump off.



4.5 Testing Complete

BLIS Testing Physical Sensors (CTPDO) Optical Sensors (CHL - NTU) Pump Testing Complete	Returns the WQM to Standby mode.
Show WQM Device Calibrations	
Done w/Troubleshooting	

4.6 Miscellaneous Commands

Show WQM Device Calibrations	Checks for and reports the calibration values stored in the WQM.
Done w/Troubleshooting	Closes the troubleshooting window.
Exit To Monitor	Factory-assisted troubleshooting.

4.7 Interrupting Standby Mode

To "wake" the WQM from standby mode, thus enabling it to receive commands and begin acquiring data:

Press the Get Status button, and within 4 seconds, press the Start WQM Sample.

Start WQM Sample	WQM Status WQM State:	
Stop WQM Sample	0%	Get Status

In the resulting window, determine whether you want to begin sampling immediately or at a later time and date.

	Start WQM Now
Start WOM	in 0 Hours 12 Minutes and 9 Seconds
✓ January, 2008	Start Sample @ 11:35 on 01/24/2008
Sun Mon Tue Wed Thu Fri Sat 30 31 1 2 3 4 5	Set Time of Day 🔹 📃 🖸
6 7 8 9 10 11 12	
13 14 15 16 17 18 19	
13 14 15 16 17 18 19 20 21 22 23 🔁 25 26	

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Appendix A: Controlling the WQM with an External Logger

There are three methods of using the WQM with an external logger.

1. Leave the WQM constantly powered and let it run a pre-selected asynchronous sample/sleep sequence, transmitting data during the sample interval. The BLIS will run once per hour.

Example: Set Sample For: to 60 and Interval Time: to 900. This will cause the WQM to sample for 60 seconds every 15 minutes.

2. Power the WQM when a sample is required and leave it powered until the entire sample sequence has completed and it has entered sleep. Using this method, the WQM will power up immediately as it receives power and will finish the sample with BLIS operation once per hour.

Example: Set Sample For: to 60, turn the power on every 15 minutes and off every 5 minutes. This will allow the WQM to complete its sample sequence before power is removed and it will wake up immediately after receiving power at the start of the next interval.

3. Power the WQM, collect data, and send the stop command when sampling is complete. This will cause the WQM to close FLNTU *Bio-wiper*.

Example: Set Sample For: to 3400 and Interval Time: to 3600. Apply power when a sample is desired and then send stop command to 5 seconds prior to removing power.



Appendix B: Using HyperTerminal

To communicate with any WET Lab's serial data instruments, you may use the Windowssupplied terminal emulator program called Hyperterm or HyperTerminal.

1. Find and start the program.

			W	_		0		
David Bor	Accessories Borland JBuilder 2005 Foundation	•	 Accessibility Entertainment 	•		•	QuickTime Adobe Reader 8	
David Hor	🛅 Broadcom	•	Microsoft Interactive Training	•		• @	 NetBeans 5.5.1 Apple Software Updat 	e
VordPad	 Dell Accessories Dell Picture Studio 3 Dell QuickSet Dell Wireless Const.))))	Address Book Calculator Command Prompt Paint Paint Parameter Command Prompt	1	n 6.0	• @	TortoiseSVN	
Mozilla Thunderbird	Modem Helper Musicmatch MetWalking	• • •	Program Compatibility wizard Synchronize Tour Windows XP WordPad			н н н		
Codewarrior IDE	CuickBooks)))	Communications Microsoft Office Tools Microsoft Project	•		Fax HyperT	erminal & Connections	•
Yahoo! Messenger	 WordPerfect Office 12 Internet Explorer 	*	Real The Weather Channel NetBoard 4 1			Networ Networ	'k Setup Wizard onnection Wizard	
	m WetView 碌 Microsoft Plus! Photo Story 2 LE ¥ MSN		My Bluetooth Places Google Earth Salaastic	10	1 1 C	Remote Wireles HyperT	e Desktop Connection is Network Setup Wizard 'erminal	•
All Programs 🖒	 WetView 7 Windows Explorer Persistor 	•	 MPort Management Suite Sea-Bird DivX 			* *		
start 🔰 🖻 🖤	Uutlook Express		m 7-Zip			ə. –		

2. Select a Connection Name and press OK. In the example, the name will be ATest.





3. Select the COM port you want to communicate to the instrument with and then press OK. In this example, COM1 has been selected.

Connect To
🍣 ATest
Enter details for the phone number that you want to dial:
Country/region: United States (1)
Area code:
Phone number:
Connect using: CDM1
OK Cancel

4. Select the desired Baud Rate (shown as Bits per second), turn off the Flow control by setting it to 'None', and press OK. In the example, the baud rate has been set to 19200.

COM1 Properties	? 🛛	Typical baud rates for WET	Labs' sensors:
Port Settings Bits per second: Data bits: Parity: Stop bits: Flow control:	19200	ECO Gen 1 (DFL, FLS,VSF): ECO Gen 2 (everything else): *ac-9: *ac-s: WQM:	9600 19200 19200 115200 19200
	Restore Defaults K Cancel Apply		



After pressing OK, you will either get ...



OR

Connected showing in the lower left hand corner. If you are connected you will start getting data as soon a test cable is connected to the computer and power is applied.

	_
Connected 0:00:13	F

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If you are **Disconnected**, make sure all other programs that might be using the COM port have been turned off, then cycle the two telephone icons on the tool bar:

This is the disconnect icon, used to turn off the PC COM port and to stop communication with the sensor.

This is the connect icon, used to turn on the PC COM port and to start communications with the sensor.

If you are connected and have data that looks like

WQM,50	00,012008,	123313	,16.2468,-	0.20,0.0)08,6.	.658,0.300,4	.917
WETS_I	IQM0500	1	012008	123314	0	0	6
	7020	7200	1	77	38	980471	1000640
	4	0	1	db90a00	0	1	0
.0							

You are all set.

If you are connected and get binary data that looks like this ...

ĺ▲ÿÇD≤'D≤\$2à≤≤ä≤D≤_

You have selected the incorrect baud rate (unless you are looking for binary data such as for the ac-9 or ac-s). Change the baud rate (Step 5).

If your meter is connected to the PC, powered on, the correct COM port is selected and you get a blank terminal screen, you might be able to use these two icons to cycle the COM port off and on to get communications started.



If you have everything selected correctly (baud rate, COM port, power is on, cable hooked up) but are unable to see any data, you may have to shut down the computer to reset the Windows driver for the COM port.

- 5. Disconnect the port using the Disconnect icon.
 - Use the Properties icon (¹) to bring up the Properties window shown above in Step 4.
 - Change the baud rate to the next choice and press OK.
 - Use the Connect icon () to reconnect to the instrument.
- 6. To log data, select Capture Text, then



select a File (you may need to use the Browse button),

Capture	? 🗙	
Folder:	C:\CF2\WQMv111\scratch\AText.TXT	
File:	C:\CF2\WQMv111\scratch\AText.TXT	Browse
	Start	Cancel

and press Start.

7. Once you have collected your data file, select Transfer > Capture Text > Stop or Pause to stop or pause data logging.





Revision History						
Revision	Date	Revision Description	Originator			
A	1/30/08	New document (DCR 561)	D. Romanko			

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