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Global Water

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Global Access Radio Modem Software

We hope you will find this software a valuable asset for your remote monitoring applications. We have tried to make this information as complete as possible but should you require assistance, our technical staff will be happy to help.

Table of Contents

I.   Client Server Radio Network Basics

A radio network for Global Water data loggers has one or more loggers in the field connected to client radio modems, and a single server radio modem connected to a PC running the Global Access software.

In the following diagram, when the PC is running Global Access, it controls the Server Radio which establishes communication with all client radios in range. Each client radio, in turn, will awaken the logger device connected to it. All client radios will remain active as long as the software remains connected so consider power consumption in battery powered systems. This topic will be discussed in more detail later in this manual.

Connection between the PC and the server radio is via a straight through serial cable with female connections on both ends. The connection between the client radio and the data logger requires a special cable. This cable is available from Global Water. A diagram is also provided at the end of this manual.
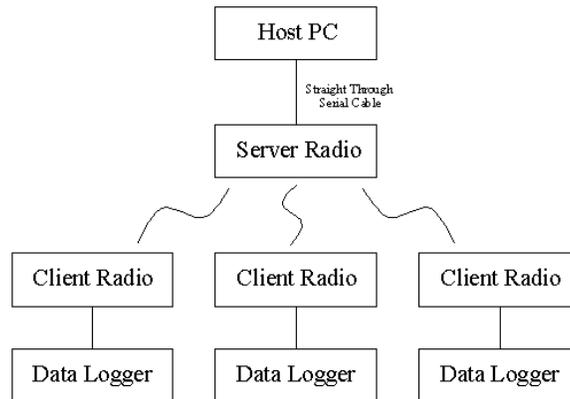
II.   Software Compatibility

This Global Access software requires a Global Water logger device with firmware version 6 or higher. The version number can be found by connecting the logger to a PC with the Global Logger II software provided with the logger, and selecting the Firmware Version option from the Help menu.

The CD provided with the Global Access radio modem software also includes a copy of Global Logger II with a revision of 2.1.1 or

higher. Older versions of Global Logger II do not support a "Fixed Baud Rate" mode which is required for radio communication. All loggers on this radio network must be programmed in fixed baud rate mode at 38,400 baud. Loggers programmed this way will work with both the Global Access and Global Logger II version 2.1.1 or higher with no incompatibility.   There are two considerations:

The first consideration is that when connecting the logger directly to a PC using any version of the Global Logger II software, you must select the 38,400 option from the baud rate pull down menu in the main connection screen or a communication error will occur.
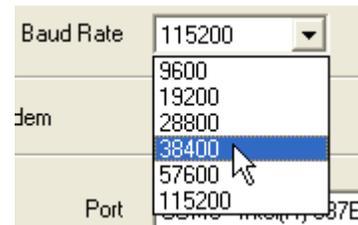
The second is that if you connect to an older version of Global Logger II than 2.1.1 and reprogram any settings, the logger will be reprogrammed into "Auto Baud Rate" mode, which is normal to most of Global Water's logger devices. This will cause communication failure when using the Global Access software. Should this happen, use a version of Global Logger II with a version of 2.1.1 or higher and reprogram the logger for fixed baud rate mode at 38,400. This is done in the Setup menu under the general settings section. Just select 38,400 and reprogram the logger. No other settings will be affected but the logger will no longer be able to communicate at any other speed.
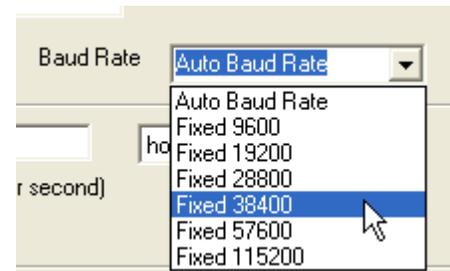
III.   Power Considerations

In remote monitoring systems, power consumption is a critical design factor so it is important to know how that power is being used.

It is assumed that since a server radio must be connected to a computer, the power consumption is not generally a problem. However; each client radio will draw 40mA all the time and almost ½ amp when it is transmitting. The amount of time spent transmitting is comparatively small but any power system must be able to permanently maintain the standby current, as well as having the capacity to supply ½ amp for short times. If power is lost, no communication is possible until it is restored.

The data loggers are designed to be powered down most of the time and in this state, will run for a very long time on fairly small battery supplies. The logger will draw about 5-7mA while it is actively recording sensor data or communicating with a computer, including during radio communication. *When the Global Access software is in a "connected" state with the server radio, all the client radios in the network will hold the logger which they are connected to in an active or powered up state.* Therefore, leaving the software running for long periods of time can drain the logger's batteries and cause data to be missed.
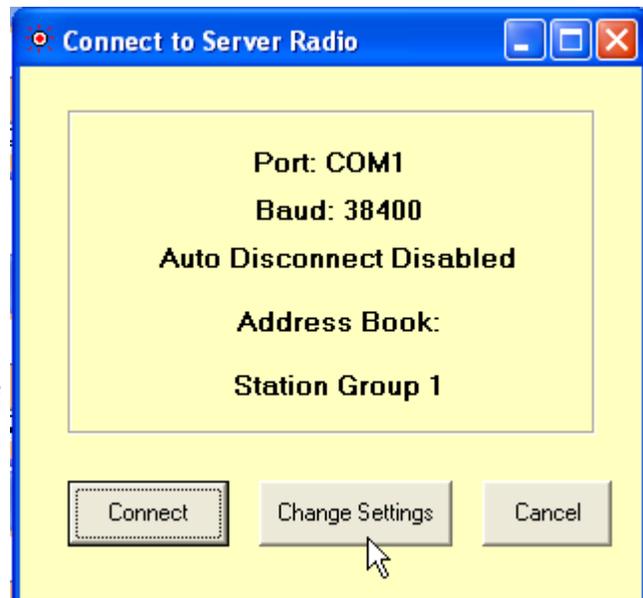
In a system where the loss of data is not acceptable, it is advised that the radio modem and the logger be powered from separate supplies. This way; should the radio loose power, the logger will continue to record data for later retrieval. If access to the logger is only occasionally required, a smaller capacity is needed than if regular monitoring is being performed. This can significantly reduce the storage capacity and cost of the power supply for certain applications, while maintaining continuous data recording.

IV. Running the Software

To install the Global Access radio modem software, insert the CDROM into the host computer and run the Setup file in the Global Access folder. A desktop icon will be installed on the desktop automatically. Double click on this icon to run the software.

The connection screen appears first with Three options, Connect, Change Settings and Cancel. Connect will cause the software to connect up to the server and power up all the loggers in the client network. Cancel will exit to the main screen in the software without connecting to the server. Change Settings is used to select a pre-defined address book, change COM port settings and enable the auto-disconnect mode.

Connect to Server Radio

Port: COM1

Baud: 38400

Auto Disconnect Disabled

Address Book:

Station Group 1

Connect   Change Settings   Cancel

Select the COM port which the server is connected to and the baud rate from the pull-down menus. Note that all the server and client radios shipped from Global Water are programmed to operate at 38,400 baud. Unless specifically stated otherwise, use only this setting.
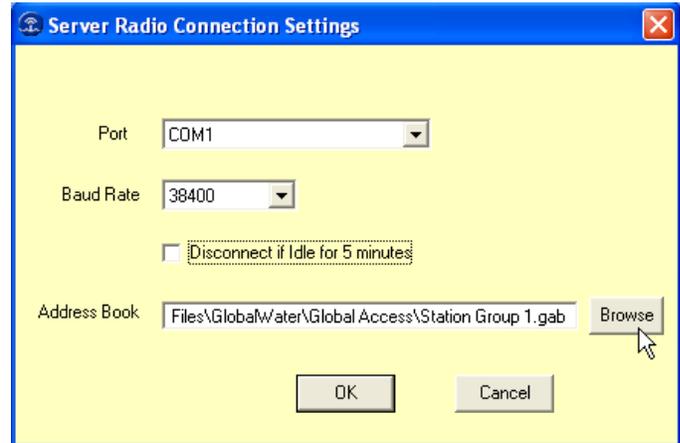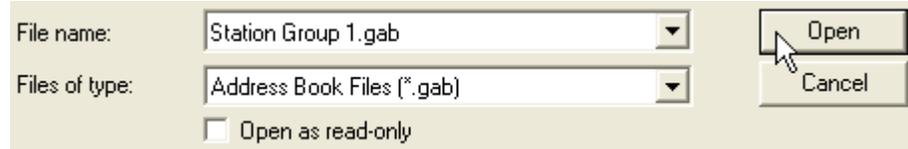
Click the checkbox if you would like to enable "Disconnect if Idle for 5 minutes" mode. In this mode, the software will automatically disconnect from the server radio after 5 minutes of inactivity to conserve power at the remote stations.
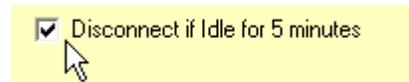
Click on Browse to select an address book containing the previously defined connection information for the client radios. An address book can also be selected from within the software.
The Address book has
The names and radio
"addresses" for a group
Of radios in a particular network. With the address book selected and the COM port defined, click on OK to get back to the connection screen and click on Connect to link the radios and go to the main screen.

V.   The Main Screen

On the left side of the main screen is the list of clients in the address book. Clicking on any of the entries will open up the display window for the radio. You can open up as many windows as the display allows. Click on the Close box at the top right corner of the window to close it, or click on the minimize button to keep the window open but minimize it the to the bottom of the screen. Click on maximize to restore it.
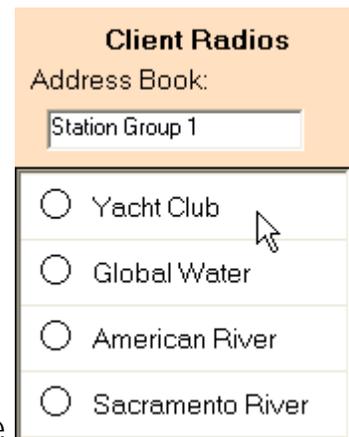
The main screen is divided into several sections; the toolbar at the top, the action buttons below the toolbar, the client radio list on the left, the server status at the bottom, and the remainder of the screen for displaying station data and information.
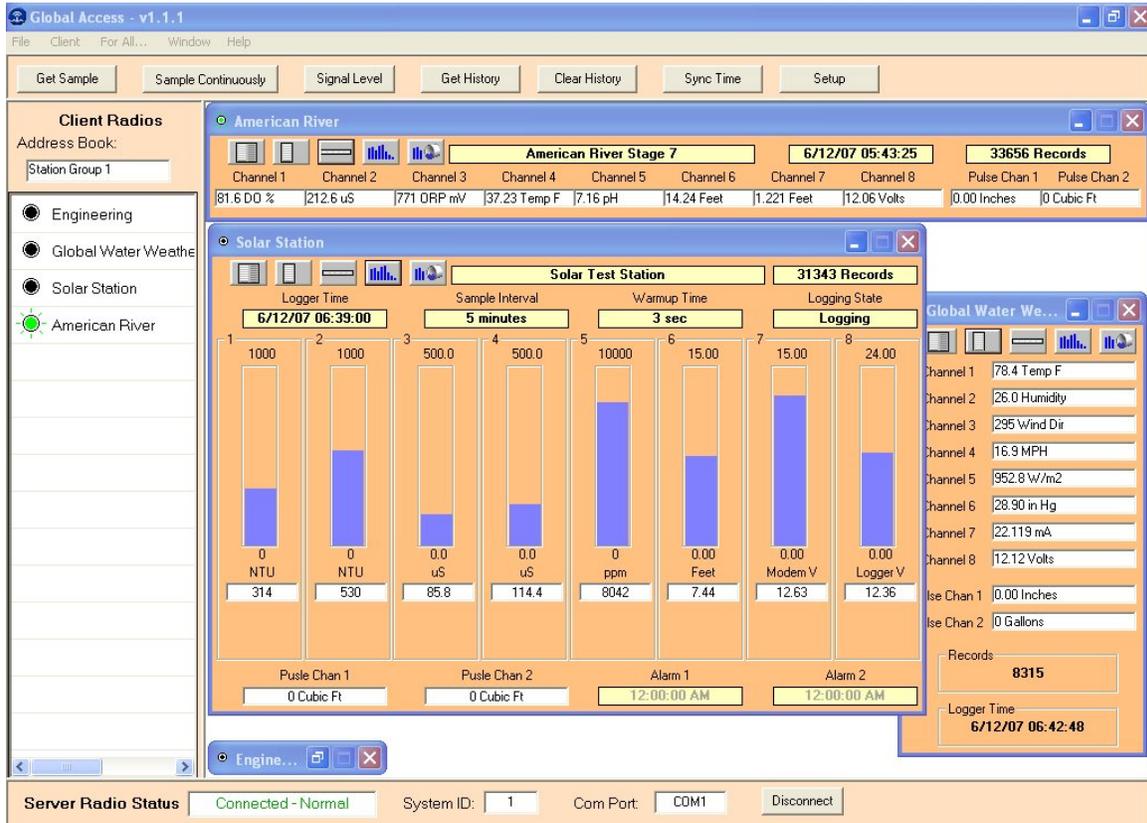
Five display modes are available, which are selected by clicking the corresponding display button in the top left of each display window.

Page View

Book View

Line View

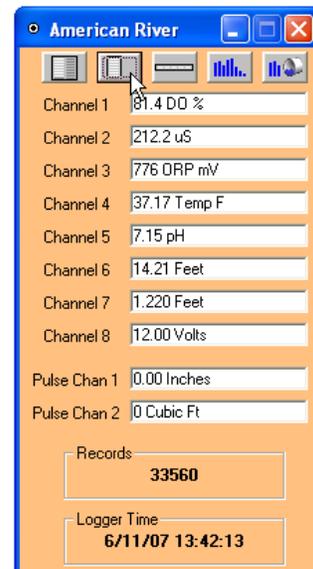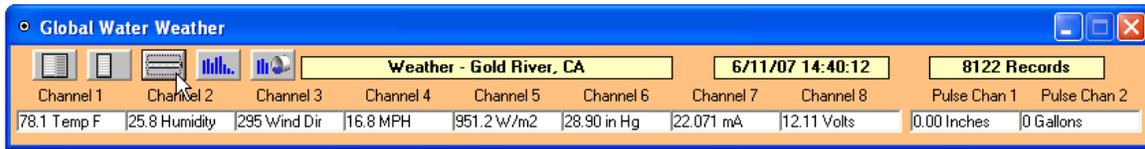| Global Water Weather									
Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8	Pulse Chan 1	Pulse Chan 2
78.1 Temp F	25.8 Humidity	295 Wind Dir	16.8 MPH	951.2 W/m2	28.90 in Hg	22.071 mA	12.11 Volts	0.00 Inches	0 Gallons

Weather - Gold River, CA   6/11/07 14:40:12   8122 Records

Bar Graph View

Solar Station

Solar Test Station   31150 Records

Logger Time	Sample Interval	Warmup Time	Logging State
6/11/07 14:38:57	5 minutes	3 sec	Logging

1	2	3	4	5	6	7	8
1000	1000	500.0	500.0	10000	15.00	15.00	24.00
0	0	0.0	0.0	0	0.00	0.00	0.00
NTU	NTU	uS	uS	ppm	Feet	Modem V	Logger V
317	535	86.5	115.5	8120	7.54	13.23	12.50

Pusle Chan 1
0 Cubic Ft

And Flow View

The flow monitor function has all the features of the Global Flow Monitor software and is used to find water flow based on level in flumes, weirs look-up tables and round pipes using the Manning's Equation.

Engineering

Global Logger   779 Records

Logger Time	Sample Interval	Warmup Time	Logging State
6/11/07 14:35:59	1 hour	3 sec	Logging

1	2	3	Flow	Velocity
3.000	122.00	24.00	100.00	100.00
0.000	-58.00	0.00	0.00	0.00
Feet	Temp F	Volts	CFS	FPS
0.928	84.23	17.01	15.65	7.9

Flow Mode:	Manning's Equation
Level Offset:	0.5 Inches
Pipe Diameter:	3 Feet
Slope:	1.25 %
Roughness:	0.014

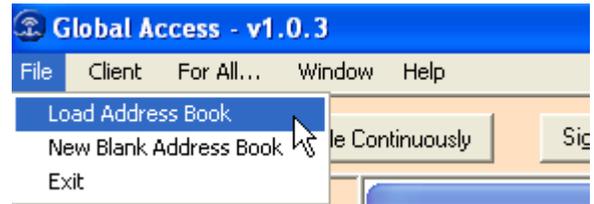| Pusle Chan 1	Pusle Chan 2	Alarm 1	Alarm 2
		12:00:00 AM	12:00:00 AM

These features are described fully in the "Global Flow Monitor Manual".

VI.   The Toolbar

File:

The File option allows address books to be loaded or created. Click on New Blank Address Book and enter a name for the new list. To load an address book, click on Load Address Book and select the desired book from those listed. While not required, the address book files are generally kept in the same folder as the software, typically C:\Program Files\Global Water\Global Access
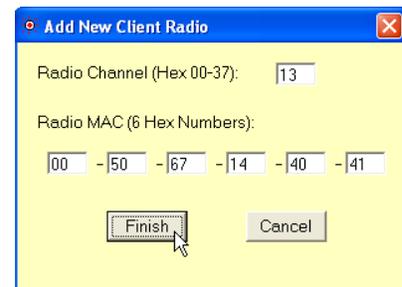
Client:

The Client menu is used to manage individual clients within an address book. This is where new radios are added and existing ones are edited and deleted.
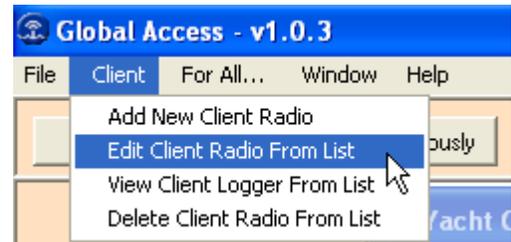
Add New Client Radio: Type in the name which the radio and logger will be referred to in the address book and at the top of the data window for that station. Click Next.

Each radio has been programmed to operate on a specific channel. Each radio also has a specific address programmed into it at the factory which distinguishes it from all others. This is known as the MAC address (media access control address) and it provided by Global Water with the purchase of each radio. Click Finish.

Edit Client Radio From List: Use this function to edit an exiting radio's name, channel and MAC address. Click on the client to be edited then make any necessary changes. Click Finish.
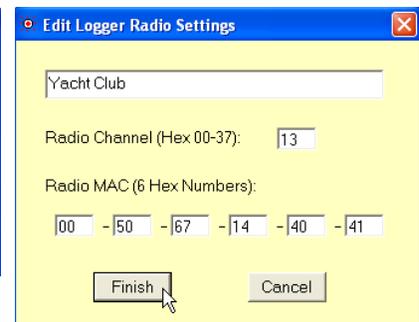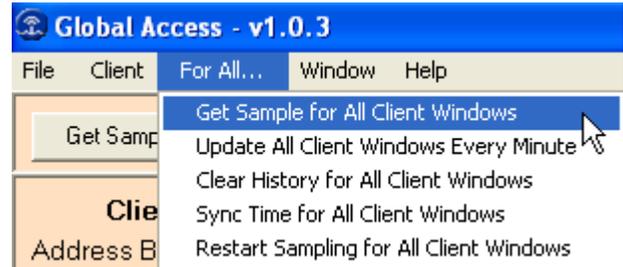
View Client Logger From List: This is an alternate way of opening a display window for a client in the current address book.

Delete Client Logger From List: Selecting this function will bring up the "Select Client" menu shown above. Clicking on a name produces a warning message. Acknowledging the prompt will delete the selection from the current address book.

For All...
These selections apply a particular operation to all of the radio loggers which have been enabled from the current address book. This includes any units with an open data window or one that has been minimized to the bottom of the screen. These operations will not be performed on loggers which are in the client list but which have not been opened at the time the operation is performed. A warning message will appear before making any critical changes and a dialog box will appear for all functions (except Update Every Minute) showing the pass/fail status of the operation on each logger .

Get Sample for All Client Windows: This causes a single reading to be taken from each logger and all data windows to updated with the current sensor readings and clock time.
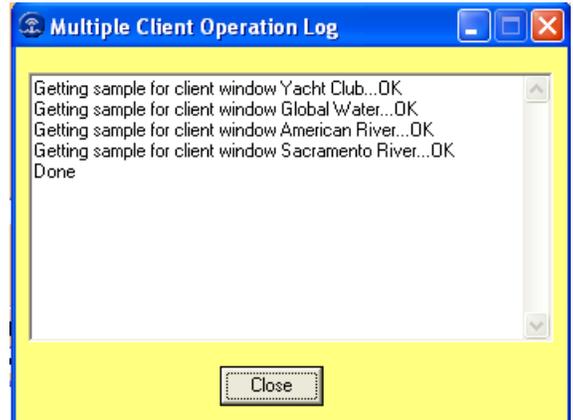
Update All Client Windows Every Minute: This puts the software into an auto-polling mode. The data fields will be automatically updated once per minute until stopped by the user. This feature will override the "Disconnect if Idle for 5 Minutes" mode so observe power consumption strategies when leaving this mode enable for long periods of time. While this mode is enabled, the Sample Continuously button changes color and function. Click this button or disconnect the software to stop Auto-Update.

Clear History for All Client Windows: This
will erase the recorded historical data for all open windows. A warning message will
appear before the action is taken.

Sync Time for All Client Windows: This will reset the loggers' clocks to the host
computer's system time for all open windows. A warning message will appear
before the action is taken.

Restart Sampling for All Client Windows: This restarts the alarm start and stop
timers on all of the loggers. If these timers are not enabled, this action has no affect.

Window:
This option allows you to select which of the open data windows are active for single
unit operations. Clicking on the blue bar at the top of each window will also select it
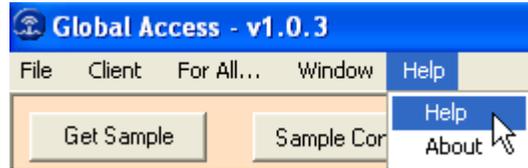for the next operation.

Help:

Online Help files are available within the
Global Access software including Indexing,
Search and Print functions. Some of the
information contained in these files is not reproduced in this manual.

VII. Action Buttons

The Action buttons perform specific actions on individual radio loggers. Only a brief description of some functions is provided here. For more detailed information, consult the online help files in the Global Access or Global Logger II software, or see the manual provided with the data logger.

These actions are performed on which ever of the open data windows has been selected. The selected radio logger is indicated by the blue bar at the top of the data window being deep blue as opposed to it being dimmed to light blue. In the screen below, the American River site is selected for following actions.
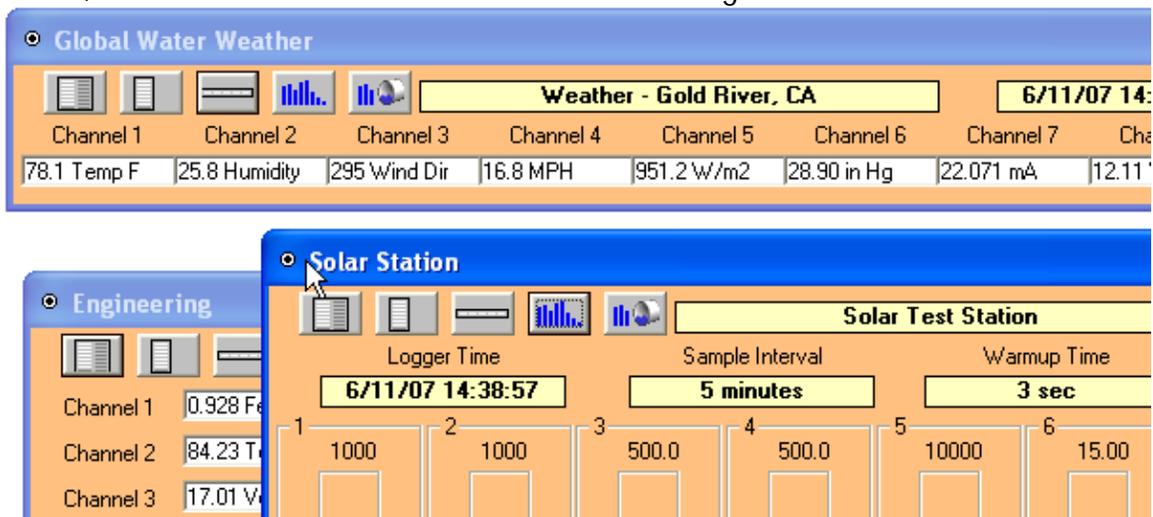
To select a data window to be active you can: Click the blue bar at the top of the desired data window, click on the radio name from the list of client radios in the address book window, select the station from the Window menu in the toolbar, or select it from the View Client Logger From List function from Client on the toolbar.

Get Sample: Clicking this button causes the Global Access software to take and display a single reading as well as update the rest of the fields of the logger's window. This data reading is not stored in the historical record and does not affect the normal recording of the logger. The sensor warm-up time is fixed at approximately 1 second.

Sample Continuously: Clicking this button causes the Global Access software to take and display a real-time reading approximately once per second until stopped by clicking it again. Each sample will also update the rest of the fields on the logger's window. These data readings are not stored in the historical record and do not affect the normal recording of the logger. The initial reading has a sensor warm-up time of 50mS and the sensor is left powered up until this feature is turned off. In this mode power is continuously applied to the sensors. This may cause the warm-up time to not be enforced for a scheduled sample if the logger determines that power has been applied for a period greater than or equal to the warm-up time.

Signal Level: A window opens to display the received signal strength of the selected radio modem. This is generally for quick reference only. A more accurate measurement can be made using diagnostics software available from Global Water.

Click the Next Radio button to cycle through all active radios one at a time. Click Exit to close the signal level window and go back to the main screen.
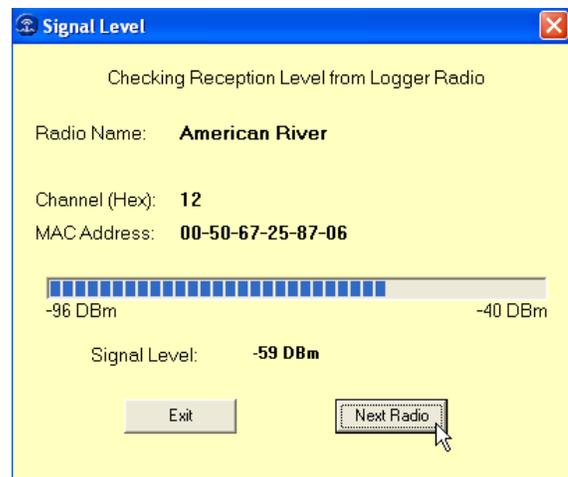
Get History: This button starts the transfer of all the historical data stored in the logger's memory to the PC. Oldest data is collected first and Clicking "Stop" halts the process.

Clear History: This resets the number of recordings in memory to zero. The user is warned first and must confirm the action before the memory is cleared.

Sync Time: This button causes the data logger's internal clock to be set to the system time of the computer it is connected to. The user is warned first and must confirm the action before the time is set.

Setup: Clicking this button enters the setup screen where the user can change and program all parameters into the data logger. Details of the Setup menus are not described here. For more information on this function, see the software help files or consult the manual supplied with the data logger.

These actions are also available by moving the cursor over an open data window and right clicking the mouse. A menu will be displayed with the actions described above as well as two others.

Firmware Version: This function returns the revision of firmware in the data logger that the modem is connected to.

**Reset Pulse Accumulators:** This action will Reset the digital pulse accumulators to zero.
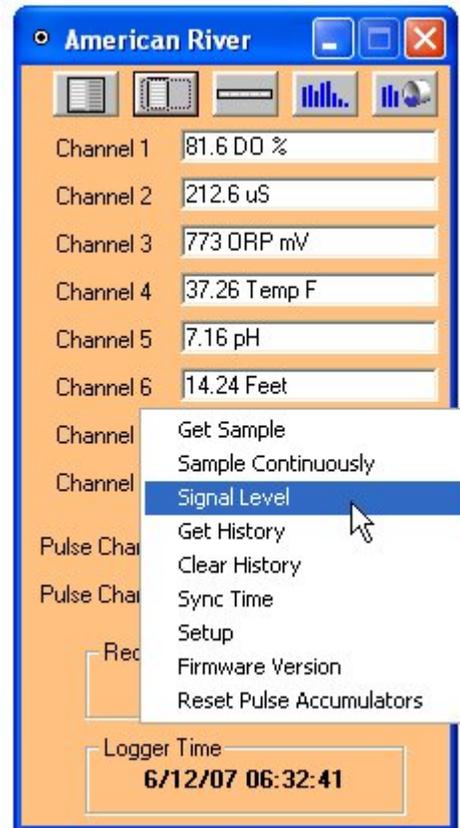
VIII. Server Status Bar

The server status bar is located at the bottom of the main screen and shows the connection status of the server. The System ID field should always read one, other system Id's are not currently supported by this software. The COM port is also shown for reference. If the server is disconnected from the software, the status is shown and the connection button reads "Connect".

Upon a successful connection, the status reads Command, indicating that the server is ready to receive commands from the software.
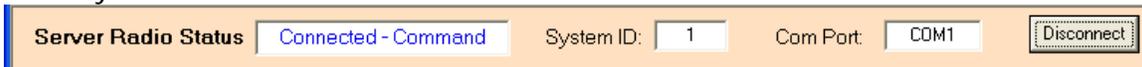
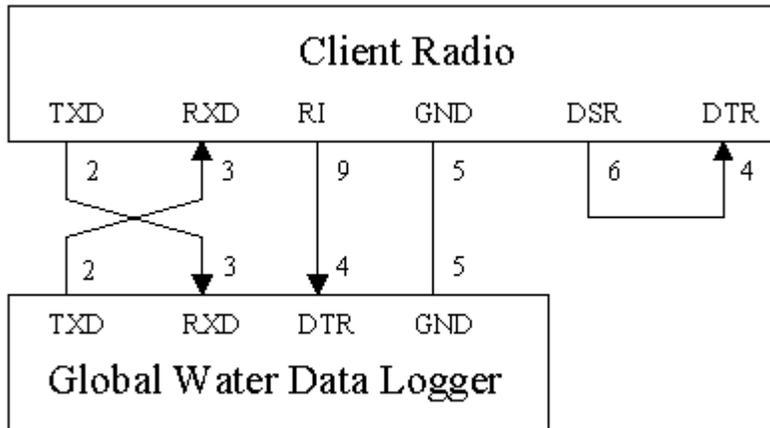When commands have been correctly received by the client radio, the status reads Normal.

Use the dual-function connection button to Connect and Disconnect the server from the software.

IX. Modem to Logger Cable

X. Customer Support

a. Call us for tech support: 800-876-1172 or (979) 690-5560 (many problems can be solved over the phone). Fax: (979) 690-0440 or Email: globalw@globalw.com.

    Be prepared to describe the problem you are experiencing including specific details of the application and installation and any additional pertinent information.

b. In the event that any equipment needs to be returned to the factory for any reason, please call to obtain an RMA# (Return Material authorization). Do not return items without an RMA# displayed on the outside of the package.

    Clean and decontaminate equipment if necessary.
    Include a written statement describing the problems.
    Send the package with shipping prepaid to our factory address. Insure your shipment, as the warranty does not cover damage incurred during transit.