HydroGuard Expert Pool Manual

Draft 09 May 2006

Swimming Pool Quality

Communication and Monitoring

Blue I Technologies

Preface

Intended Use

This manual is for qualified and trained pool service technicians who will install and service the HydroGuard Water Quality Controllers. It provides instructions on how to install the Expert Pool Communicator with and existing HydroGuard controller, as well as how to monitor using the internet.

Table of Contents

Overview of Chapters

This document is divided into chapters and appendices functionally according to the various steps involved in installing and operating the HydroGuard system.

Chapter	Description
Chapter 1: Precautions	Describes the intended product use and provides general precautions
Chapter 2: Overview	Provides a general overview of Expert Pool's operation
Chapter 3: Hardware Installation	Instructs how to install the Expert Pool Communicator and how to integrate it with a HydroGuard controller
Chapter 4: Software Installation and Operation	Instructs how to install and use the use the Expert Pool website to monitor the HydroGuard controller

Overview

The Expert Pool Communicator continuously transmits information from the HydroGuard Controller(s) and allows for remote monitoring of the HydroGuard controller(s). This is accomplished via a wireless connection using cellular GPRS technology. A single Expert Pool Communicator can be used to monitor up to 5 HydroGuard Controllers, in the same location (within 100 m).

Remote Monitoring

The Expert Pool Communicator provides real-time, fully web-based monitoring. The communicator accepts HydroGuard's alarms and readings and transmits them to a web-based application server. In the event of user-selected alarm conditions, the communicator can send a notification via SMS (cellular Short Message Service to pool managers, inspectors, service technicians, and other authorized pool maintenance personnel.

The communications between HydroGuard and pool maintenance personnel is bidirectional. HydroGuard settings can be managed remotely through any internet connection and even from a mobile telephone.

Caution: Remote control of pool water chemistry is potentially dangerous to bathers. The HydroGuard remote monitoring and control service is set by default to monitoring and reporting only. Remote control is available only upon special request.

System Components

The Expert pool Communicator (Figure 1) is a single unit comprised of the following components:

Communicator – a small enclosure that contains electronics for communication, the SIM card, and the connections to the controller, the antenna, and the power input connection.

Antenna – Receives and sends information wirelessly to and from controller.

Power Adapter – Provides power to communicator. Converts power supply from source of either 110V or 220V AC to 9V DC 800 mA.

SIM card (not provided) – small, primarily plastic card that fits in the communicator and provides information to connect to cellular network. This card is provided by a variety of cellular companies and is used in most newer cellular phones. Please contact Blue I Technologies for a list of suppliers in your area.

Figure 1: Expert Pool Communicator and Components

Hardware Installation

The installation process starts with the manual installation and connection of the Expert Pool communicator to the controller, as described in this chapter. Once installed, the controller can be monitored via the Expert Pool website, which is explained in Chapter 4.

Selecting a Location

The location where the Communicator is installed is dependent on various considerations:

Dry Area – The communicator includes electronic circuitry that may short circuit, and is susceptible to corrosion with high ambient moisture levels.

Pool Chemicals - Pool chemicals can be corrosive to electronic circuitry. It is highly recommended that the communicator is not installed adjacent to the pool chemicals storage area or the dosing systems themselves.

Minimum Distance from Cellular Signal - The communicator must be installed such that the antenna is able to be located in an area with sufficient cellular signal (from the carrier of the SIM card). How to determine this will be explained in 3.2.

Note: The communicator box is IP 55 rated, but should still be prevented from water or chemical exposure to increase the lifetime of operation. Ensure that the location does not compromise the equipment. The antenna may not be extended, but the cable from the communicator to the controller may be extended up to 100m (300 ft) to allow for cellular signal to be obtained and/or for the communicator to be located away from water or chemical hazards.

Site Requirements and Installation

The HydroGuard communicator is wall mounted. It is advisable to install it where the pool operator and technician can easily view.

Hardware Installation

The following procedure will determine the required location of the communicator in order to receive cellular signal.

A SIM card from a cellular provider will need to be obtained. The SIM card will need to allow for data transfer using GPRS and should have a minimum data plan of 10 MB/month. Blue I can provide you with a list of approved cellular providers in your area.

1. Remove the cover from the Expert Pool Communicator. Figure 2 displays the main components inside the expert pool communicator.

2. Lift the cover from the SIM card holder and place the SIM card into the holder with the notch facing up and to the right.

3. Close the holder and slide to lock in place. The card will only fit one way so do not force it. If there is resistance, check for proper card orientation.

4. Attach the antenna line to the threaded connection on the bottom of the communicator

5. Place the antenna in a location that is expected to receive strong consistent cellular signal. Do not modify the antenna/wire or connection to allow for this; move the communicator if necessary (see below for more information).

6. Plug in the power to the communicator into a 110V or 220V AC plug

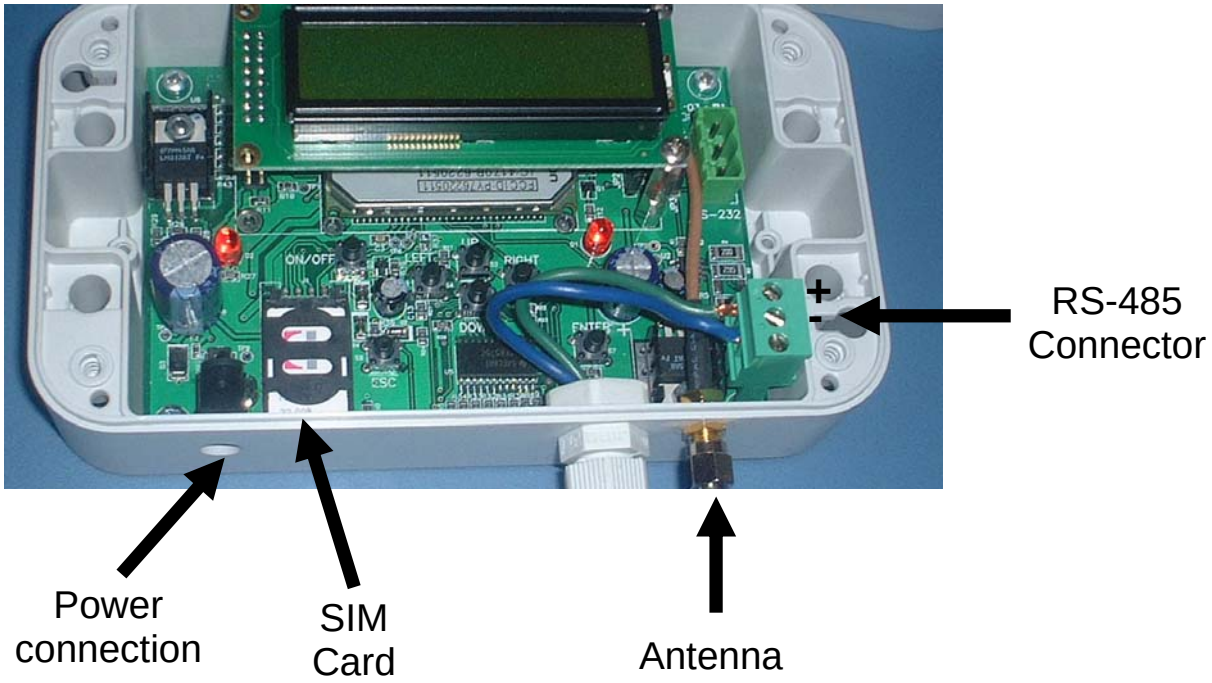

Figure 2: Expert Pool Communicator – Internal Components

7. Wait about one minute for the LCD screen to light and wait to see the screen that displays "Reception %"

8. If needed, relocate the antenna and communicator until a consistent cellular signal with greater than 10% is obtained. Reception strength of 40-50% is very good, so if possible move the antenna to obtain signal strength in this range or higher, since low reception strength will result in inconsistent operation.

9. The communicator may be located up to 100m (330 ft) from the controller, because of the RS 485 protocol. Make sure that the controller is less than 100m (330 feet) from the communicator. If it is not, repeat step 9 keeping the communicator within 100m of the controller.

10. Disconnect the power supply and mount the communicator to a stable wall

11. Connect one end of a 2-wire cable to the RS485 communicator terminal block on the communicator. For example purposes, it is assumed that the wire colors are black and white:
    a. Connect the Black wire to the top (+) position of the communicator terminal block
    b. Connect the White wire to the bottom (-) position of the communicator terminal block.
    c. If multiple controllers are to be connected to the same communicator, continue the two wires to the next controllers ("daisy-chain" together), up to a total of 5
    d. The total wire length may not exceed 100m.

Turn off the power to the controller and connect the other end of the 2-wire cable the communication terminal block on the controller board, with the black wire to the bottom (+) position and the white wire at the top (-) position on the controller terminal block, as shown in

12. Figure 3. The wire may be extended up to 100m as needed.

13. Replace the communicator cover and secure with the supplied screws

14. Reconnect the power supply

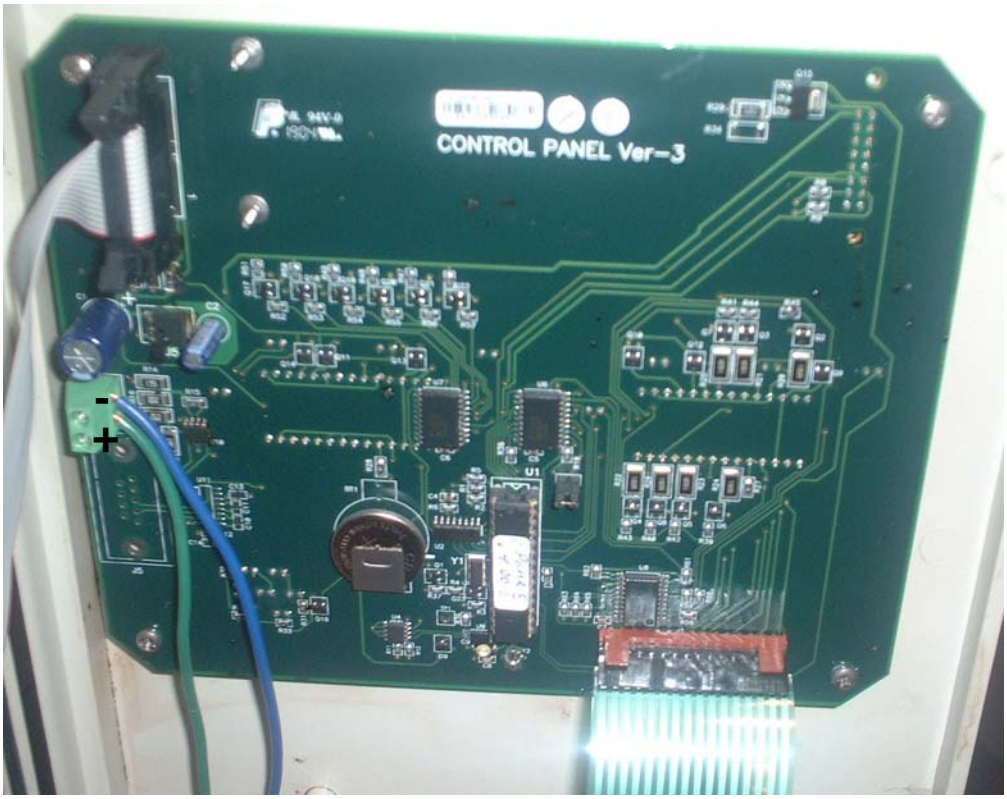

Figure 3: Connection of RS485 wire to Controller Control Panel

Configuring the controller

1. Enter the technician menu
    a. Press Scroll
    b. Press Up and down together
2. Press Scroll until “Address” appears
3. Set the Address to 1
    a. Press Enter
    b. Enter the technician password
    c. Press Enter - twice
    d. Press down until 1 appears
4. If multiple controllers are connected, assign addresses in order from 1 up to a maximum of 5.

Confirming Proper Operation

The following outlines the messages that should appear on the LCD screen of the communicator. This will allow you to determine if everything is working properly.

1. Unplug the power supply and reconnect, and the LCD screen will light in after about a minute

2. The first screen will display
    a. The communicator software version
    b. Reception strength (%)

3. Confirm that the reception strength is above 10% (50% is very good).

4. The next screen will display
    a. Op: " cellular provider"
    b. "APN" (which is the password required to access a cellular providers network – some carriers may not use one)

5. Confirm that the name appearing on the screen is the carrier of the SIM card installed in the controller, which may be abbreviated. If it is not, the communicator will not work properly and the SIM card is likely not installed properly.

6. The next screen will display
    a. Serial number
    b. #
    c. This is the serial number of the communicator and is used for tracking and troubleshooting purposes

7. The next screen will display
    a. Connecting to GPRS site

8. The next screen will display
    a. Checking for connected HG

9. The next 3 screens will cycle quickly through:
    a. Checking in Data, Checking SMS and Checking Alarm
    b. HG: 1

Confirm that a number appears after "HG:". This is the address of the controller connected to the communicator. If multiple controllers are connected, it will show the address of each controller for which a connection is present.

If the screens do not display information similar to what is described above there is a problem with that part of the connection process. The information will continue to cycle through to provide a constant update as to the connection status.

Website and Monitoring

Website

This section describes how to use the Expert Pool website and the system requirements for its use.

1. Go to www.poolexpert.net and the login page will appear, as shown in Figure 4.
2. Enter your username and password and press enter
    a. Contact your authorized dealer or Blue I Technologies to obtain a username and password. You will need the serial number from the back of the communicator to obtain the appropriate user name and password.
3. If the username and password are accepted, the site will load and the graph of the first pool at the first location will appear, Figure 5.
    a. If you have access to multiple locations, select the site and pool from the pull down menus

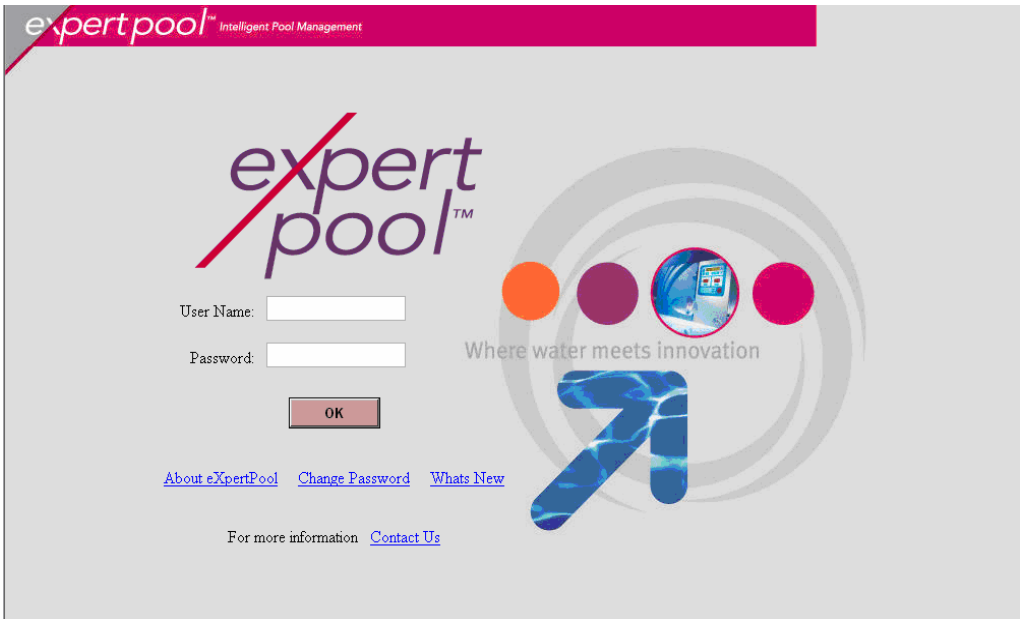

Figure 4: Login Screen of Expert Pool Website

Current Values and Pool Overview

The current values of the pool including: Total Cl, Free Cl, pH, ORP, Temperature, Turbidity, and Flow Rate are displayed in a bar graph. If an optional feature is not installed (i.e. Total Cl, Turbidity and/or Flow) the bar will be shown in gray. The current communicator connection status and alarm information is displayed below the graph. Unlike the controller display, all current alarms will be displayed; not just the one with the highest priority/importance. Lastly, the links for additional information are contained on the left side of the window. The figure below is an example of the pool overview screen.

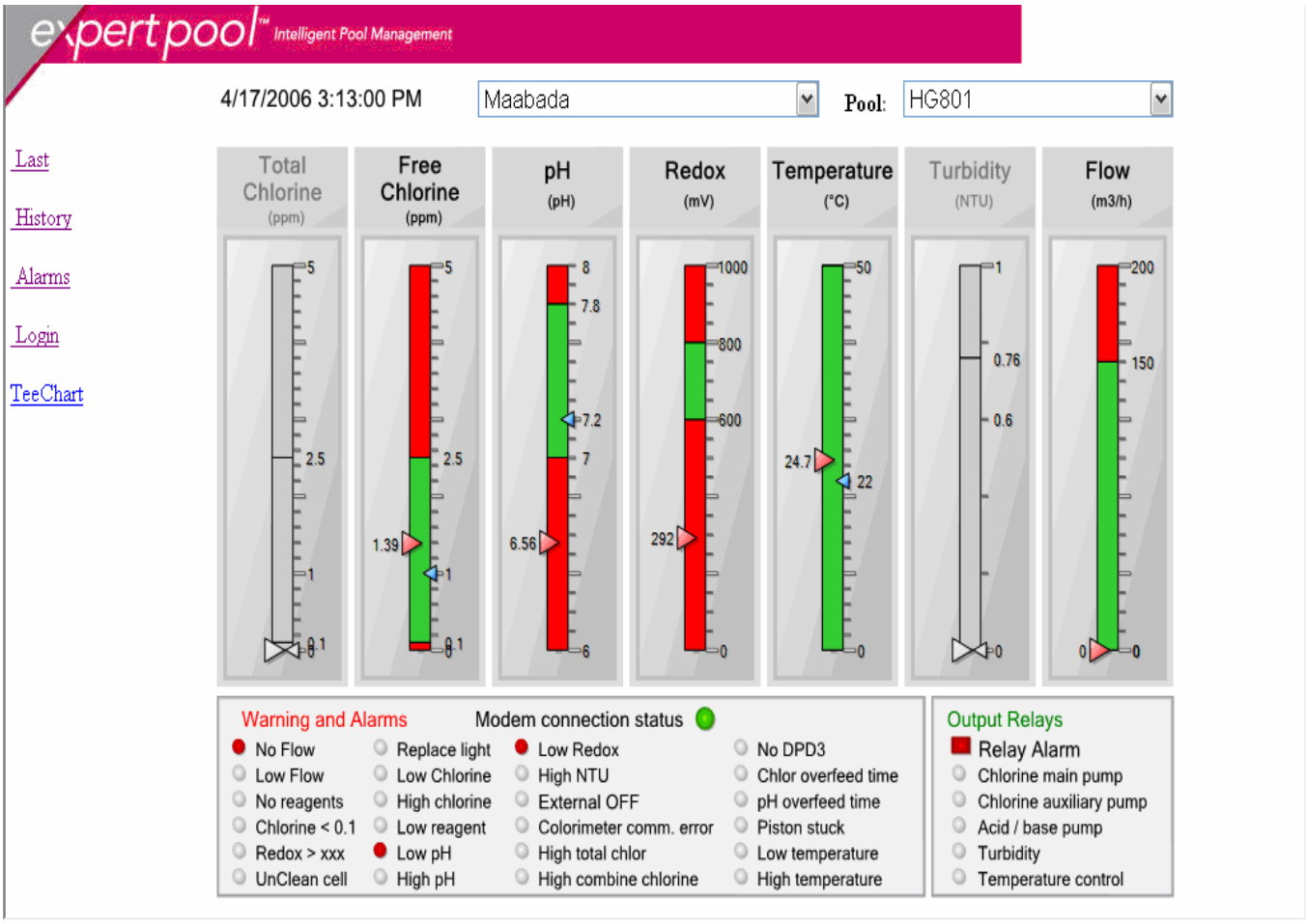

Figure 5: Initial Pool Summary Display: Current Values, Alarms and Relay Operation

Historical Values and Graphical Features

Click on the History link to open the pool history graph and the graph will be displayed as shown in Figure 6.

Note: In order to view the graph feature, your computer must have Active X installed, and you must be using internet explorer. If Active X is not installed, please click on Tee Graph and download and install the file. If you are not sure, try to view the graph and if no graph appears, exit and install Active X.

The graph will show data for the past 3 days. To view data for a specific date, click on the book icon and select a date and click ok and the data will be displayed for that date and the previous week.

Select which data are to be presented by checking or un-checking the boxes at the bottom of the graph. To display the actual data points, check the box marked "Click to turn Display Value on/off". If the display value is on (checked), clicking on a data point will show the number value of that point.

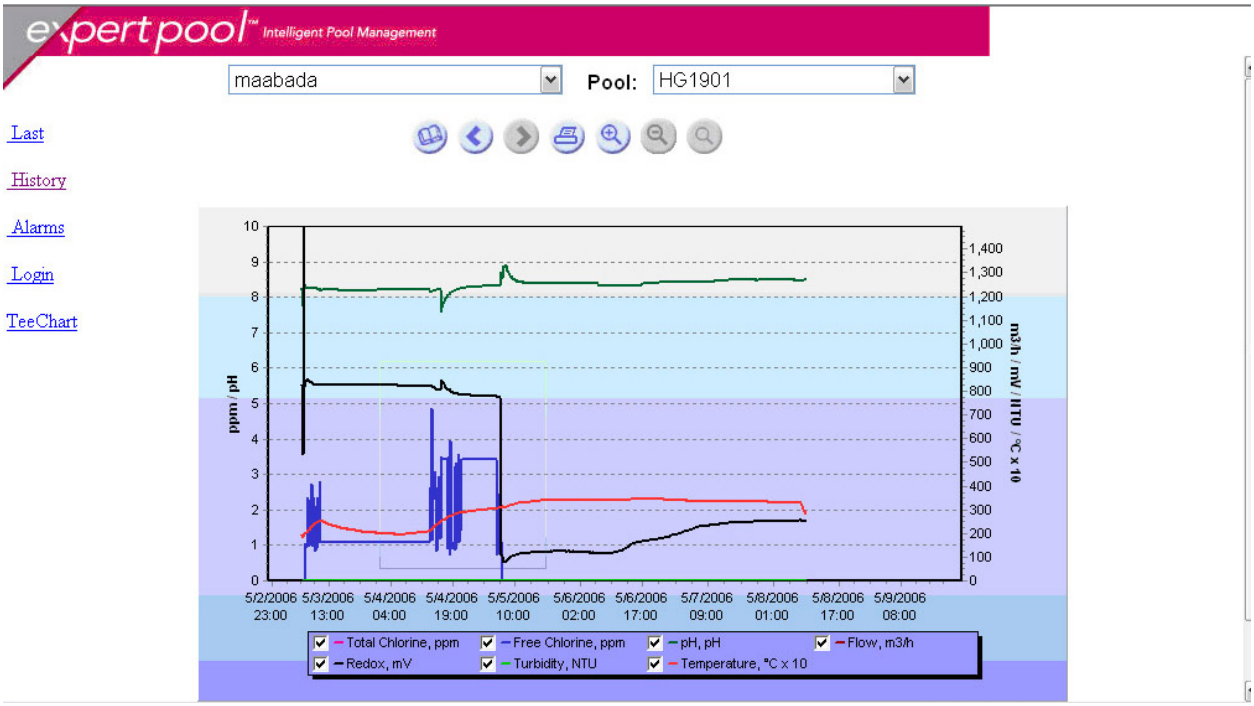

Figure 6: Historical graph of Pool Conditions

By clicking on the graph and dragging a box around a potion of the data, you can zoom-in to get more information about what happened during a particular time period as shown in Figure 7.

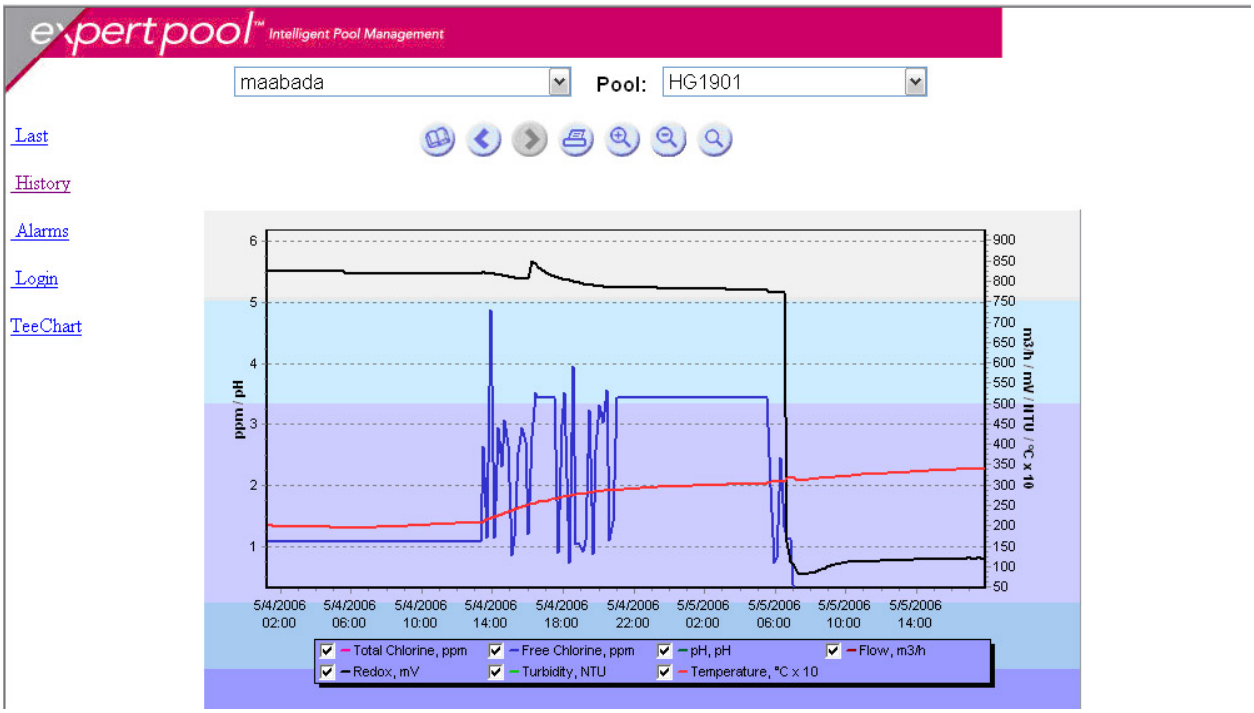

Figure 7: Zoom-in of Historical Graph

Alarm Information

Click on the Alarm link to open the pool alarm history table, Figure 8. The alarms will be presented with start time, end time and duration. Alarms that have not been resolved will be shown in red. If you have access to multiple sites or multiple pools within a sit, the site and pool may be selected from the pull-down menus. The figure below is an example of the alarm information page. Data may be sorted by begin date, end date, duration, description or device by clicking on the column heading for which you would like to sort. The default is begin date.

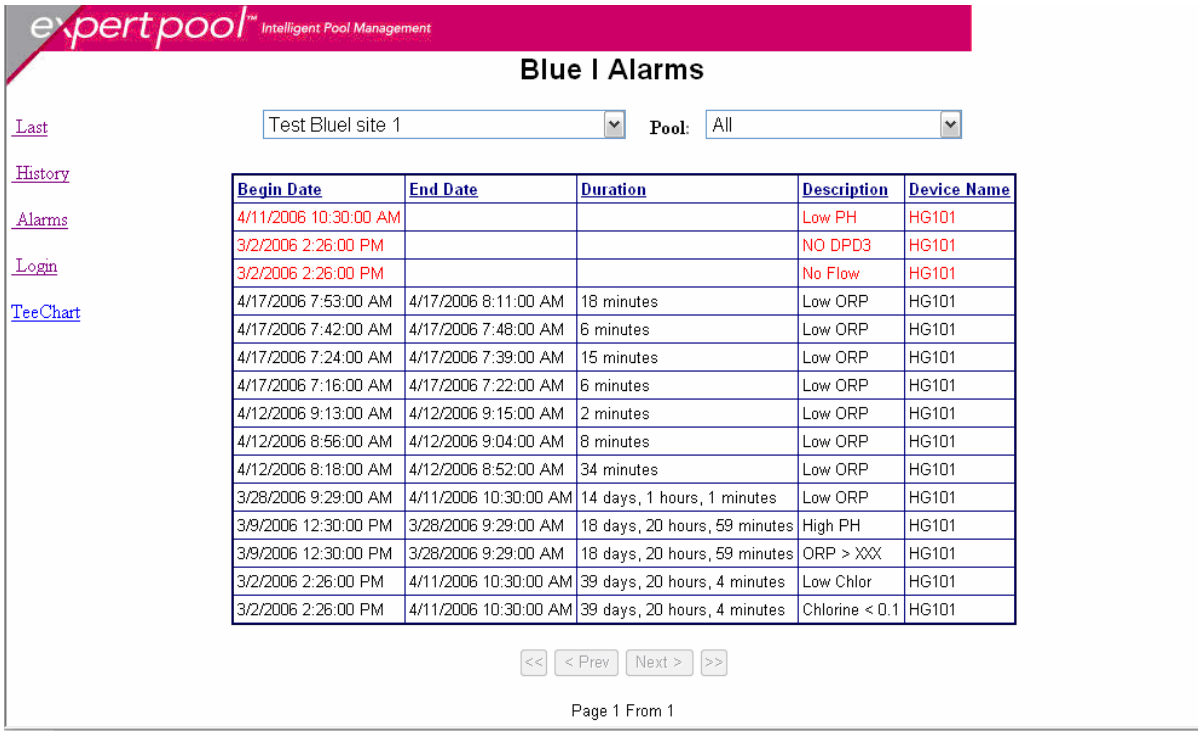

Figure 8: Alarm History Table

Troubleshooting

If there is a problem with receiving information from the controller/communicator, the following issues should be checked first.

LCD Display	Problem	Corrective Action
Reception < 10%	poor signal	move communicator and antenna to location with stronger signal
HG: "no number"	No connection between communicator and controller	Check wire connection, switch wires between RS485 terminal blocks
OP: "no carrier or wrong carrier"	SIM card not connected properly	Check SIM card installation. Confirm that SIM and provider have GPRS ability active

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