

# WaterGuard Online

## Modem for Blue I Water Technologies Analyzers & Controllers



Online Water Quality Analysis and Communication

## User Manual

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V.1.2

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## Preface

### *Intended Use*

This manual is for qualified and trained service technicians who will install and service the HYDROGUARD Water Quality Analyzers and Controllers. It provides instructions on:

- Setting up new WaterGuard communication modem
- Installing the modem with an existing **HYDROGUARD** system
- Monitoring water quality data from the **HYDROGUARD** Water Quality Analyzer using an Internet connection

## Overview

The WaterGuard communication modem continuously transmits information from **HYDROGUARD** analyzers and allows for remote monitoring of water quality conditions. This is accomplished via a wireless connection using cellular GPRS and GSM technology. A single **WaterGuard** communication modem can be used to monitor up to five **HYDROGUARD** systems within a 100-meter range.

### *Remote Monitoring*

The **WaterGuard** provides real-time, fully web-based monitoring. The modem receives **HYDROGUARD** alarms and readings and transmits them to a web-based application server. In the event of user-selected alarm conditions, the modem can transmit a notification via SMS to relevant system managers, inspectors, service technicians, and/or other authorized maintenance personnel.



Caution: Remote control of water chemistry is potentially dangerous. The **HYDROGUARD**'s remote communication function is set by default to perform monitoring and reporting only.

## Hardware Installation

### *Selecting a Location*

Consider the following factors to choose the best location for installation of the **WaterGuard** modem:

**Convenient access** – The **WaterGuard** should be installed where it can be easily viewed and operated.

**Dry area** – The **WaterGuard** operates with electricity and includes electronic circuitry that is susceptible to short-circuiting and/or corrosion when exposed to water or high ambient moisture levels.

**Away from chemicals** – Many water treatment chemicals can be corrosive to the **WaterGuard**'s circuitry. It is highly recommended that the **WaterGuard** not be installed adjacent to a storage area for chemicals or the dosing systems themselves.

**Electrical outlet** – The **WaterGuard** requires connection to an electrical outlet.

**Minimum Distance from Cellular Signal** – The location must enable the **WaterGuard** antenna is able to obtain a sufficient cellular signal from its SIM card provider.

**Software Installation** – Following the software installation procedure below will help determine the optimal location to assure a strong cellular signal.

***Note:** The modem unit is IP 55 rated, but should still be installed away from water or chemical exposure to increase operation lifetime. Ensure that the location will not compromise or damage the device. The antenna is a fixed length, but the cable extending from the **HYDROGUARD** analyzer to the modem can be extended up to 100m (328 ft) so that the modem can be installed where a stronger cellular signal is available and away from water and/or chemical hazards.*

## Software Setup

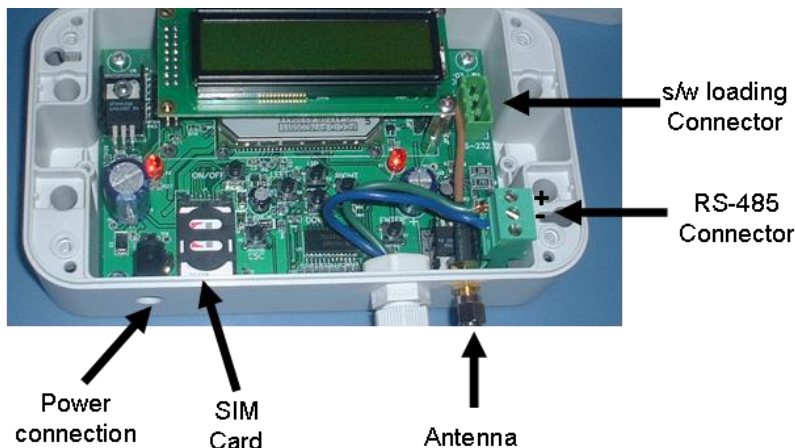
The following procedure will help determine the required location of the modem in order to receive cellular signal.

First test the cellular signal before attaching the **WaterGuard** communication modem to the wall.

1. A SIM card from a local cellular provider is required. The SIM card will need to allow for data transfer using GPRS and should have a minimum data plan of 5 MB/month. Your Blue I Water Technologies representative can provide you with a list of approved cellular providers in your area.

Figure 1 below displays the main components inside the **WaterGuard** communication modem.

2. Remove the modem cover.
3. Lift the SIM card holder cover and secure the SIM card in place with the notch face-up on the right. The SIM card will only fit one way so do not insert with force. If there is resistance, check for correct card orientation.
4. Close the holder and slide to lock in place.
5. Attach the antenna to the threaded connection on the bottom of the modem.
6. Extend the antenna to a location that is expected to receive a constant and strong cellular signal. Do not modify the antenna/wire or connection to allow for this; move the modem to a better location if necessary (see below for more information).
7. The antenna should point up; not sideways.
8. Connect the modem to a 9V 1.3A power supply.



**Figure 1: WaterGuard Communication Modem – Internal Components**

9. Wait about one minute for the LCD screen to light up and then to display “Reception %”
10. If necessary, relocate the antenna and **WaterGuard** modem until a consistent cellular signal that is optimally above 50% and not lower than 35% is obtained. A low signal will result in inconsistent operation.
11. The modem may be located up to 100m (328 ft) from the analyzer unit.

Once a constant and strong signal has been detected in a hazard-free location, disconnect the power supply and mount the modem on a stable wall

## Connecting the WaterGuard and HYDROGUARD Analyzer

1. Connect one end of a 2-wire cable to the RS485 terminal block on the modem.
  - a. Connect the positive wire to the top (+) position of the terminal block
  - b. Connect the negative wire to the bottom (-) position of the terminal block.
  - c. If multiple controllers are to be connected to the same modem, continue the two wires to the next controllers (“daisy-chain” together), up to a total of 5 analyzers.
  - d. The total wire length must not exceed 100m (328ft).
2. Turn off the power to the analyzer/controller and connect the other end of the 2-wire cable to the RS485 communication terminal block on the analyzer/controller board
  - a. Connect the positive (+) wire to the positive (+) position on the analyzer/controller terminal block
  - b. Connect the negative (-) wire to the negative (-) position on the analyzer/controller terminal block
  - c. The wire may be extended up to 100m (328ft) as needed.
3. Reconnect the power supply and confirm that the connected analyzer is found:
  - a. Wait for the screen checking for connected HYDROGUARD and the screens indicated which analyzer(s) is found (see Confirming Proper Operation section below).
  - b. If no analyzer is found, try switching the (+) and (-) wires.
4. Replace the modem cover and secure with the supplied screws.

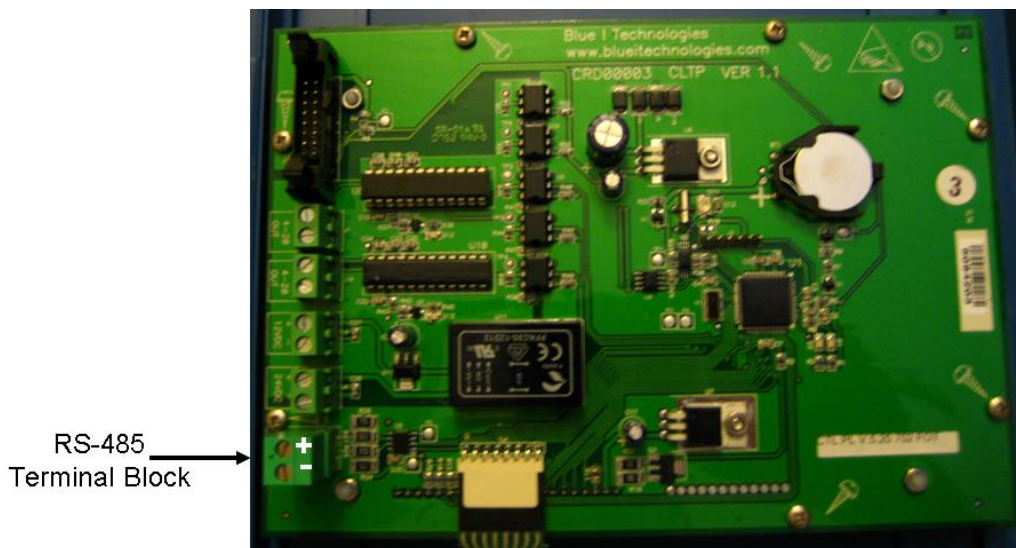


Figure 2: RS-485 Wire Connection to HYDROGUARD analyzer control panel

## ***Configuring the Controller or Analyzer***

1. Enter the technician menu
  - a. Press Scroll or Menu
  - b. Press Up and down together
2. Press Scroll until "Address" appears
3. Set the Address to 1
  - a. Press Enter or OK
  - b. Enter the technician password
  - c. Press Enter or OK - twice
  - d. Press down until 1 appears
4. If multiple controllers or analyzers 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 modem. This will allow you to determine that everything is working properly.

1. Unplug and reconnect the power supply. The LCD screen will turn on after about one minute.
2. The first screen will display:
  - a. The modem software version
  - b. Reception strength (%)
3. Confirm that the reception strength is above 35%  
*Note: The display may have to run through a few screens before determining the operator and before any reception appears.*
4. The next screens will display:
  - a. Searching 1
  - b. Searching 2
  - c. Searching for Operator & APN
  - d. Operator Number
  - e. Op: "cellular provider"
  - f. "APN" (which is the password required to access a cellular providers network – some carriers may not use one)
5. If you receive a message "No GRPS... Check SIM Plan", this indicates that the modem is unable to connect to the cellular company. The modem will automatically restart. If you still receive this message, please confirm:
  - a. Reception is > 35%
  - b. The SIM card has an active GPRS or GSM data plan
  - c. The SIM is unlocked (you may need to install in a cell phone and enter a pin code to unlock)
  - d. The cellular company is an approved operator with Blue I Water Technologies.
6. The next screen will display:
  - a. Serial number
  - b. #This is the serial number of the modem and is used for tracking and troubleshooting purposes
7. The next screens will display:

- a. Connecting to site 1
  - b. Connecting.... GPRS site
  - c. Connecting to site 2
  - d. Connecting.... GPRS site
8. If you receive a message “No Site Please wait”:
- a. There is no GRPS connection available
    - i. GRPS is not active on SIM card plan or
    - ii. no coverage in your area
  - b. The website is temporarily down
9. The next screen will display “Checking for connected HG”
10. The screen will then show:
- a. Found HG: # (the number corresponds to the address of the analyzer/controller)
  - b. Found “type” (the model found: i.e. Prizma, 702, etc.)
11. If no HG is found:
- a. Confirm that the connected analyzers/controllers are ON
  - b. Check the wired connection between the modem and analyzer/controller
  - c. Switch the (+) and (-) wires on the modem.
12. The next several screens will cycle quickly through: “Checking in Data”, “Checking SMS” and “Checking Alarm”
13. The modem will continue to cycle through these menus providing you continued updates on communication and connection status.

## Connection to Network

In order for the WaterGuard modem to be viewed online, the information from the modem and the SIM card must be provided to Blue I Water Technologies. The process below describes how this will be done and also how future changes can be made.

### ***Before leaving the installation site***

Make a record of the following information:

1. Modem serial number, located
  - a. on sticker on the side of modem
  - b. on LCD display during the cycling of the modem status
2. SIM card phone number
3. Installation location/Time Zone

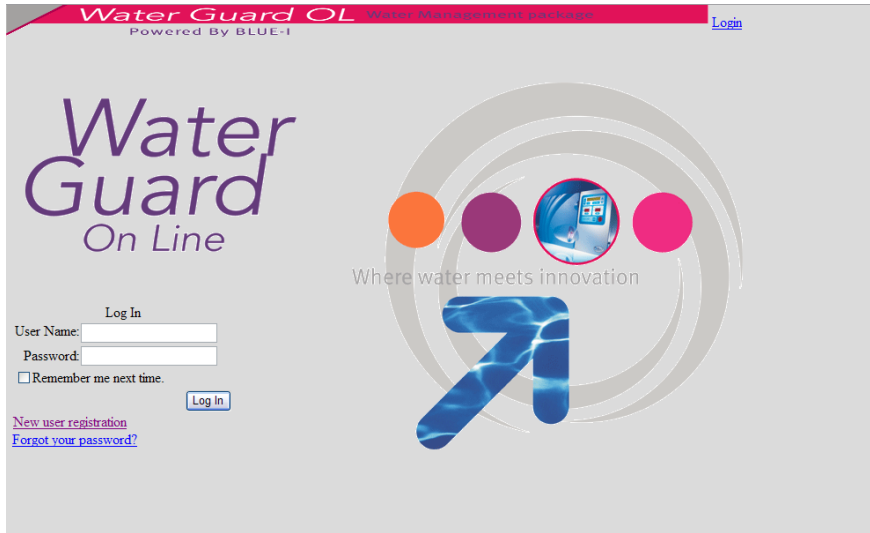
### ***Registering new user / modem***

Please contact the distributor from whom the modem was purchased and provide the modem serial number (located on the side of the modem unit). The distributor will set up the new user on the Waterguardol website, and will send you the user name and password to access the site.



## Website and Online Monitoring

1. Go to [www.waterguardol.com](http://www.waterguardol.com) and the login page will appear
2. Enter your username and password and press enter



**Figure 3: Login page**

3. If it is the first time login-in, a disclaimer will appear
  - a. Read the disclaimer, complete the additional information and click on Agree.

Please read the disclaimer and fill in the detail below

Client IP address: 68.36.139.136

\* Required field

User name

Serial numbers

Name

Last name

Company

Country

City

Address

Phone

E-mail

Confirm E-mail

Mobile

Fax

Industry

Title

I agree to the terms of the disclaimer

Once agreed, you'll be sent an E-mail to the address in the E-mail above, with a new password.  
Once logged in, you can change your password.

[Agree](#) [Disagree](#)

Terms of Use

1. General

This internet web site ("Site") was established by Blue-I Water Technology Ltd. ("Blue I") in order to allow its customers who have received username and password to view over the Internet the information generated by the controllers purchase by such customers and that were connected to the Site Service (as defined below). In order to fulfill such purpose Blue I is operating and organizing this Site. The Terms of Use described hereunder are applying to this Site. Each user who wishes to use this Site or any services in connection herewith, or any user who enters the

**Figure 4: Disclaimer page for first-time login**

- b. An email will be sent to the primary email address within approximately 10 minutes with a new temporary password.
  - c. Enter user name and temporary password.
  - d. Go to "User Settings" tab to change password.
4. The website will load and the graph of the first site at the first location will appear. If you have access to multiple locations, select the site and location from the pull down menus

## Current Values and Site Overview

After logging in, the first screen that appears is the current values, including: Total Cl, Free Cl, pH, ORP, Temperature, Turbidity, Conductivity and Flow Rate, are displayed in a bar graph. If an optional feature is not installed (e.g., Total Cl, Turbidity, etc.) the bar will be shown in gray.

The current modem 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. To minimize cellular costs, the modem will combine data transfers to minimize cellular charges due to rounding up to a minimum data amount (usually 1kb) for each transfer. The Live Mode button will switch to real-time data transfer from the modem, which may result in higher cellular charges. Please consult your cellular company and/or your Blue I Water Technologies distributor for more information.

The window on the left of the screen displays all sites accessible and clicking on the site will change to that site. The tabs at the top allow for switching between current conditions, historical graphs and data, alarms, and settings. The figure below is an example of the site overview screen.

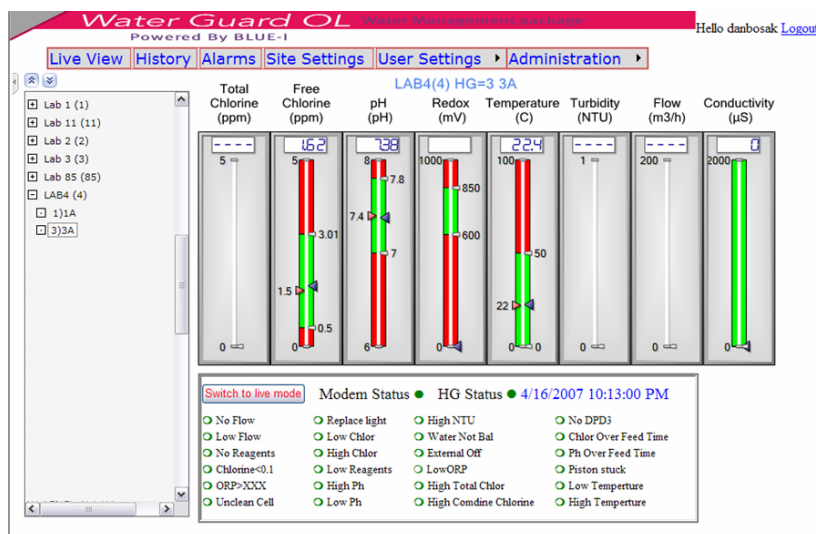


Figure 5: Current values view

## Historical Values and Graphical Features

Click on the History tab and the graph will be displayed with the default display will show data for the past day. To view data for other ranges, either select from the standard zoom options or select a specific date range and click GO. To zoom in closer, use the zoom icons at the top or click and drag the cursor over the graph section you want to zoom. Select which data are to be presented by checking or un-checking the boxes at the bottom of the graph. To display or remove the data points, click the lightning bolt icon at the top. If the display value is ON, moving the cursor over the data point will display the specific value of that point. To export the data to excel, click on the excel icon and then either open or save.

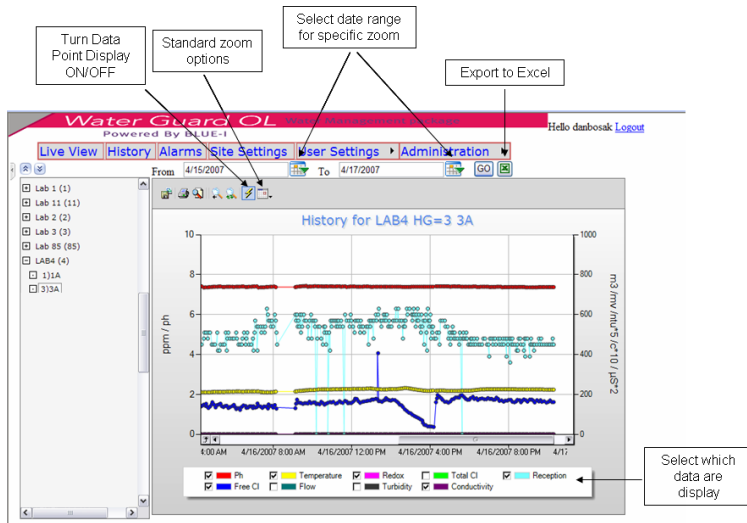


Figure 6: Historical values view

## Alarm Information

Click on the Alarm tab to open the Alarm history table. The alarms will be presented with start time, end time and duration. Alarms that have not been resolved will be shown in red. The figure below is an example of the alarm information page. Data may be sorted by begin date, end date, duration, or description by clicking on the column heading for which you would like to sort. The default is beginning date.



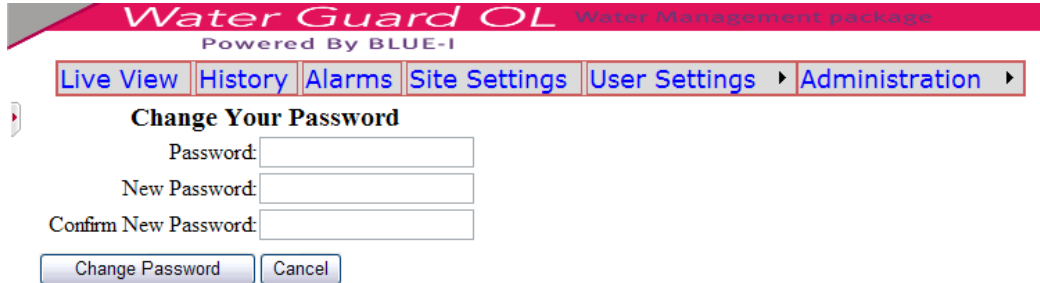
Figure 7: Alarm history view

## User Settings

### Changing a Password

Click on the User Settings Tab and select Password Settings.

Enter the previous password and then the new password twice and click on Change Password.



The screenshot shows the 'Water Guard OL' interface with the 'User Settings' tab selected. The 'Change Your Password' form contains three input fields: 'Password:', 'New Password:', and 'Confirm New Password:'. Below the fields are two buttons: 'Change Password' and 'Cancel'.

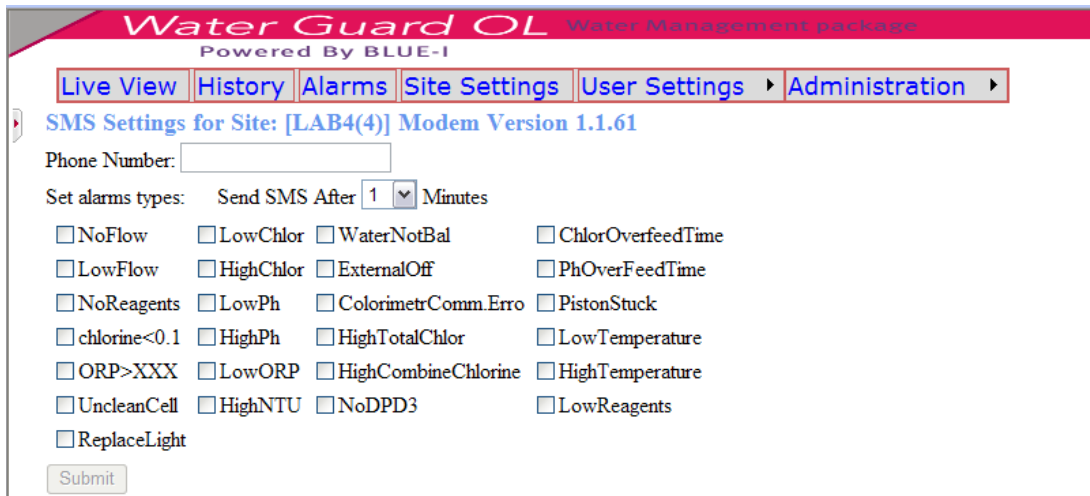
Figure 8: Changing password

### SMS Settings

Alarm messages may be sent as a text message to cellular phones that are registered as users of the account which is requesting the alarms.

Click on the User Settings Tab and select SMS Settings.

1. Enter the phone number where SMS messages are to be sent
  - a. Use local number format (i.e. no country codes, 111-222-3333)
  - b. Do not use dashes or spaces
2. Select which Alarms should generate an SMS message
3. Select the time delay before sending the SMS.
  - a. This will prevent SMS messages for problems that are correct automatically
4. Click Submit



The screenshot shows the 'SMS Settings for Site: [LAB4(4)] Modem Version 1.1.61' form. It includes a 'Phone Number:' input field, a 'Set alarms types:' section with a 'Send SMS After' dropdown set to '1' and 'Minutes' text, and a grid of checkboxes for various alarm types. A 'Submit' button is located at the bottom left.

<input type="checkbox"/> NoFlow	<input type="checkbox"/> LowChlor	<input type="checkbox"/> Water.NotBal	<input type="checkbox"/> ChlorOverfeedTime
<input type="checkbox"/> LowFlow	<input type="checkbox"/> HighChlor	<input type="checkbox"/> ExternalOff	<input type="checkbox"/> PhOverFeedTime
<input type="checkbox"/> NoReagents	<input type="checkbox"/> LowPh	<input type="checkbox"/> ColorimetrComm.Erro	<input type="checkbox"/> PistonStuck
<input type="checkbox"/> chlorine<0.1	<input type="checkbox"/> HighPh	<input type="checkbox"/> HighTotalChlor	<input type="checkbox"/> LowTemperature
<input type="checkbox"/> ORP>XXX	<input type="checkbox"/> LowORP	<input type="checkbox"/> HighCombineChlorine	<input type="checkbox"/> HighTemperature
<input type="checkbox"/> UncleanCell	<input type="checkbox"/> HighNTU	<input type="checkbox"/> NoDPD3	<input type="checkbox"/> LowReagents
<input type="checkbox"/> ReplaceLight			

Figure 9: SMS settings for alarms

## Troubleshooting

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

LCD Display	Problem	Corrective Action
Reception < 35%	Poor signal	Move modem and antenna to location with stronger signal.
No number	No connection between modem and analyzer	Check wire connections between the analyzer and modem (+ to +, - to -).
No carrier or wrong carrier	SIM card not connected properly	Check SIM card installation. Confirm that SIM and provider have GPRS ability active.
No GSM	Wrong pin code	Check in mobile phone and confirm that SIM is active.
No GPRS	No active data plan	Confirm that GPRS data plan is active and that the cellular provider is an approved provider for Blue I Water Technologies.
No Site. Please wait	Problem with SIM card	Confirm that GPRS data plan is active and that the cellular provider is an approved provider for Blue I Water Technologies.

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