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Water Guard Online Manual

Online Water Quality Communication and Monitoring

May 2007

Blue I
Water Technologies

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 how to install the Water Guard Communicator with and existing HydroGuard system, as well as how to monitor using the internet.

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Overview

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

Remote Monitoring

The Water Guard 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 managers, inspectors, service technicians, and other authorized maintenance personnel.

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

Caution: Remote control of water chemistry is potentially dangerous. The HydroGuard remote monitoring and control service is set by default to monitoring and reporting only.

System Components

The Water Guard Communicator 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 analyzer/controller, the antenna, and the power input connection.

Antenna - Receives and sends information wirelessly to and from analyzer/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 new cellular phones. Please contact Blue I Water Technologies for a list of suppliers in your area.

Hardware Installation

The installation process starts with the manual installation and connection of the Water Guard communicator to the controller, as described in this chapter. Once installed, the controller can be monitored via the Water Guard 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.

Chemicals - Water treatment chemicals can be corrosive to electronic circuitry. It is highly recommended that the communicator is not installed adjacent to the 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 (325 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 operators and technicians 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 Water Guard Communicator. Figure 1 displays the main components inside the Water Guard 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. Connect the 9V 1.3A power supply to the communicator.

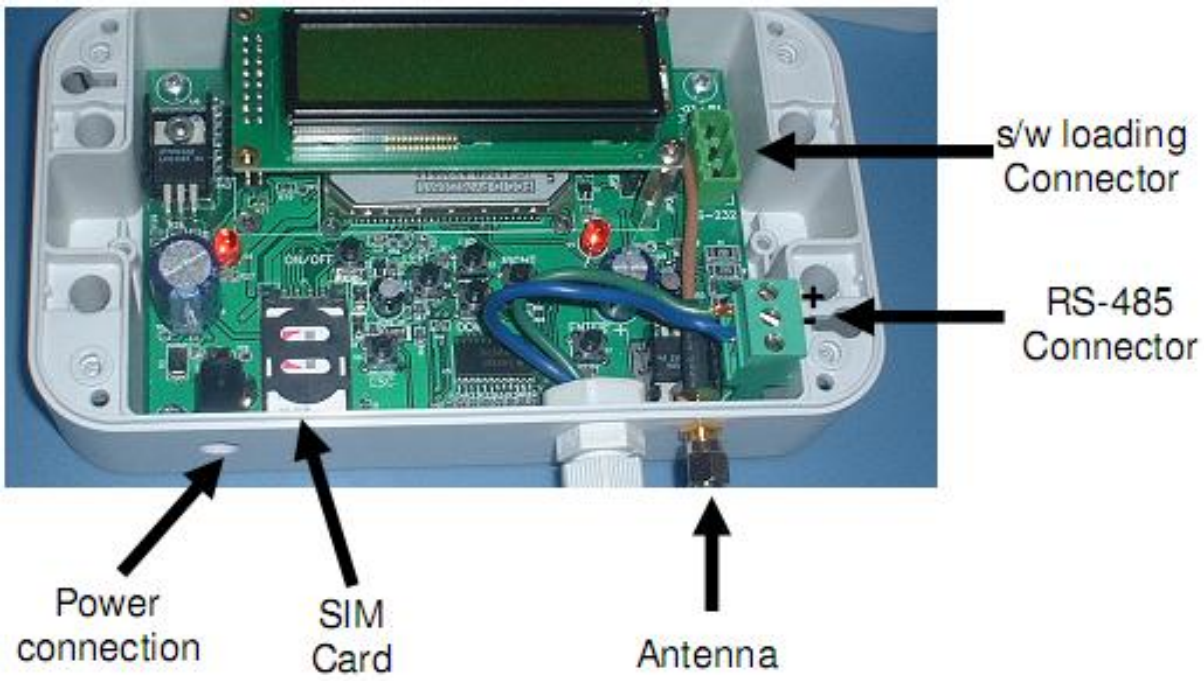

Figure 1: Water Guard Communicator - Internal Components

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 45-50% is obtained. Reception strength above 60% 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 (325 ft) from the controller, because of the RS 485 protocol. Make sure that the controller is less than 100m (325 feet) from the communicator. If it is not, repeat step 9 keeping the communicator within 100m of the controller. (Do not extend the antenna but rather relocate the communicator.)

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.

12. 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
    a. Connect the black wire to the bottom (+) position
    b. Connect the white wire at the top (-) position on the controller terminal block
    c. 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 2: Connection of RS485 wire to Controller Control Panel

Configuring the controller

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 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 45-50%
    a. Note: it may have to cycle through once to determine the operator, before any reception will appear.

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 analyzer or controller connected to the communicator. If multiple systems are connected, it will show the address of each system 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.

Adding to Network

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

Before leaving the installation site

Write down the following information:

1. communicator serial number (located on a sticker on the back and will also appear during the cycling of the communicator status)

2. SIM card number

3. SIM card data number (if it has one)

4. Cellular provider

After leaving the site

Send an email to info@blueitechnologies.com with the following table filled out with the appropriate information. The table is available for download from the website.

Comm. #	User Name	Password	email	Site	data number	voice number	# of Sites	defined	un-defined	Remarks
GPRS 01	Bluel	a123b123	bluel@bluei.com	test pool	+52-111-222-3333	+52-111-222-3336	1	X		Israel
GPRS 02	Bluetech	a123b123	bluel@bluei.com	test pool	+52-111-222-3334	+52-111-222-3337	2		X	US
GPRS 03	Bluewater	a123b123	bluel@bluei.com	test pool	+52-111-222-3335	+52-111-222-3338	1		X	China

1. Select the username and password for the site
    a. Username is alpha-numeric up to 12 characters and is not case sensitive
    b. Password numeric up to 8 characters
    c. If multiple users are created, please add a separate line for each user. This also includes users that can see this site as well as other sites.

2. Select either Defined or Undefined
    a. Defined means that this is an existing communicator (previously set-up) and a change is being made (please highlight the change)
    b. Undefined means that this is a new communicator that is being set-up for the first time

3. Select an email address for the account
    a. To be used to retrieve lost passwords and/or verify account information

Website and Monitoring

This section describes how to use the Water Guard website and the system requirements for its use.

1. Go to www.waterguardol.com and the login page will appear, as shown in Figure 3.

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 website will load and the graph of the first site at the first location will appear, Figure 4.
    a. If you have access to multiple locations, select the site and location from the pull down menus

Figure 3: Login Screen of Water Guard Website

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 (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. To minimize cellular costs, the communicator 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 communicator, which may result in higher cellular charges. Please consult your cellular company and/or Blue I Technologies' representative 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.

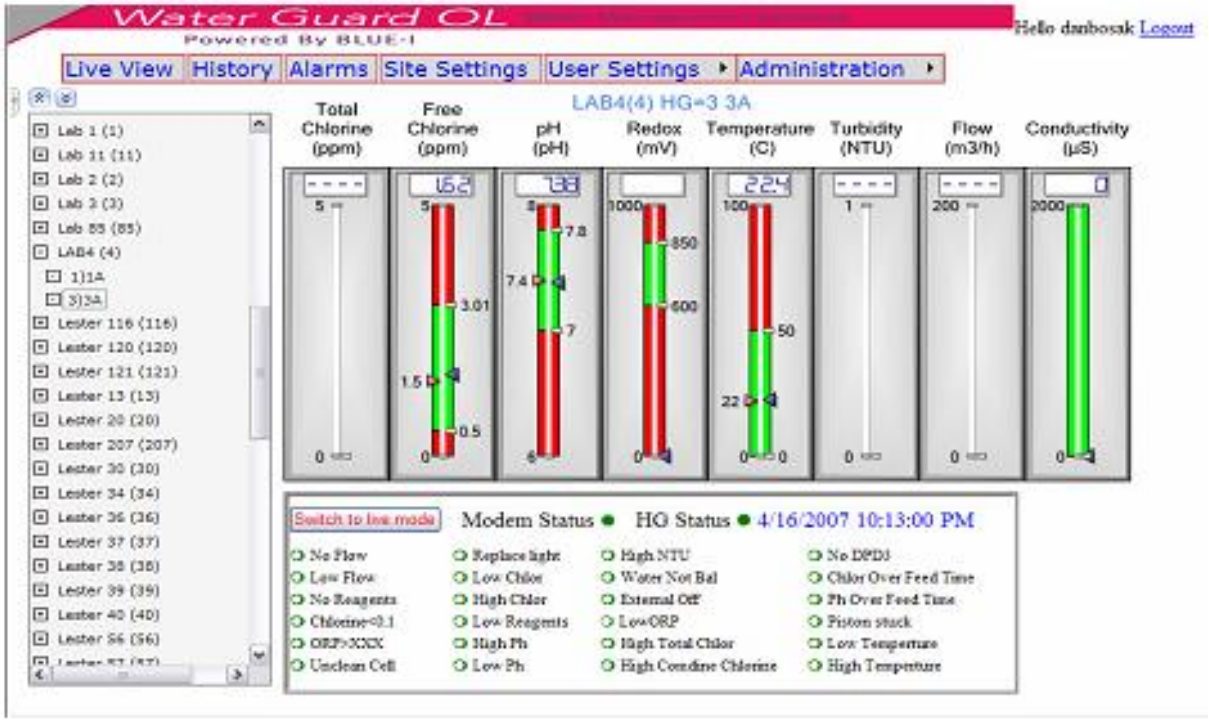

Figure 4: Initial Summary Display: Current Values, Alarms and Relay Operation

Historical Values and Graphical Features

Click on the History tab and the graph will be displayed as shown in Figure 5. 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.

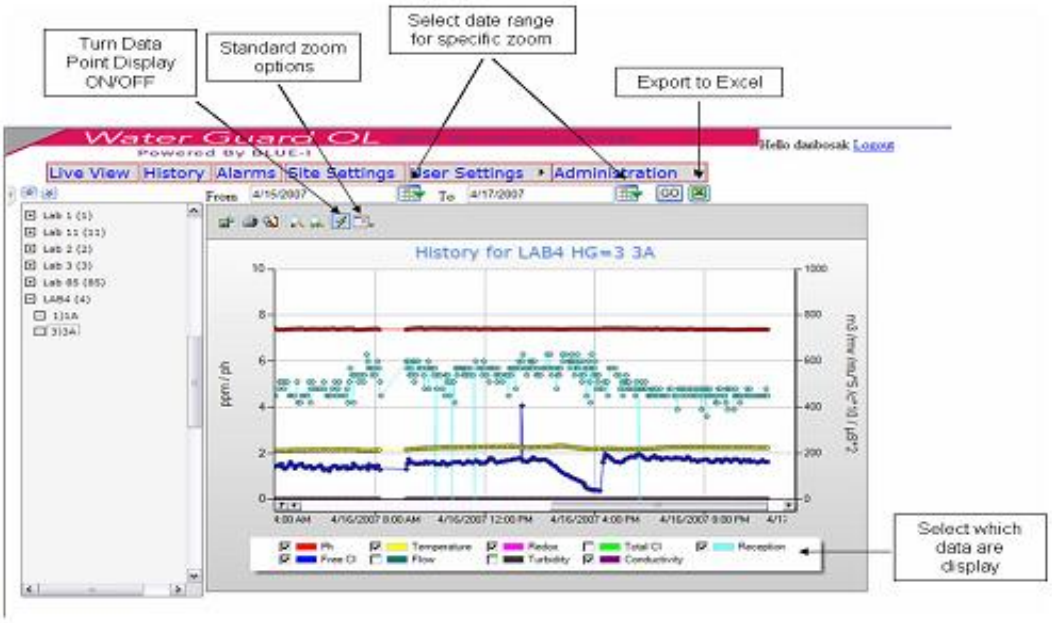

Figure 5: Historical graph of Water Conditions

Alarm Information

Click on the Alarm tab to open the Alarm history table, Figure 6. 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.

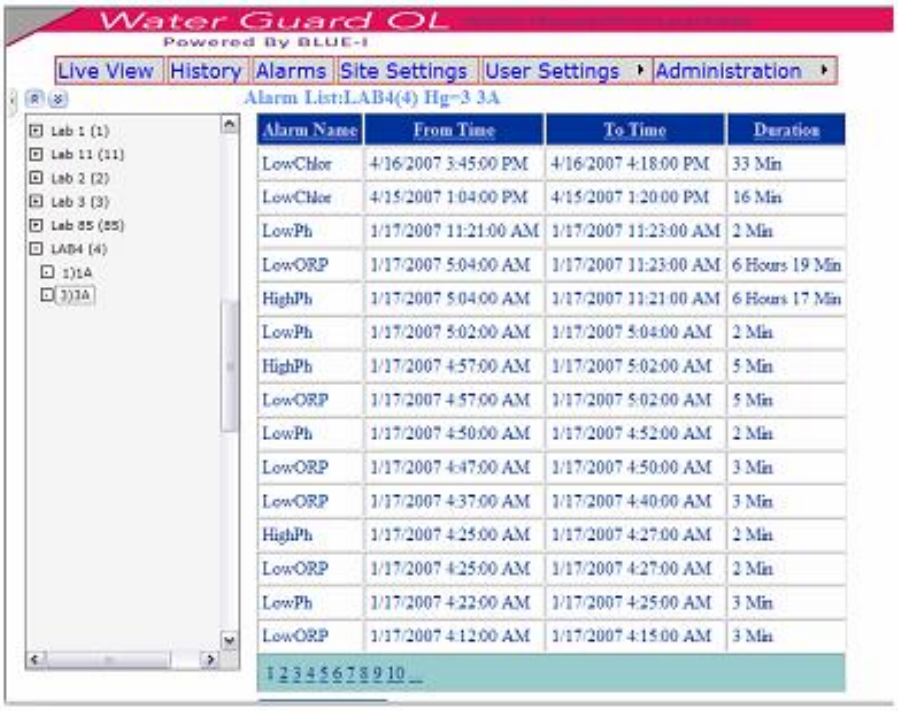

Figure 6: Alarm History Table

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.

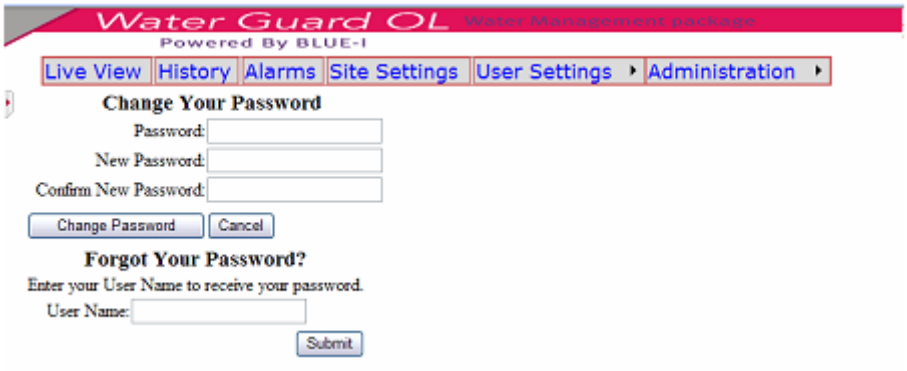

Figure 7: Changing Password Menu

SMS Settings

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, etc.)
    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

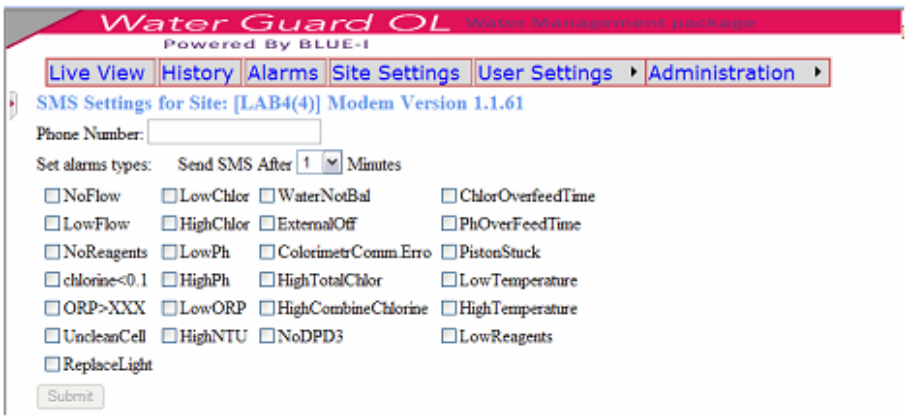

Figure 8: Configuring SMS Settings

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 < 45%	Poor signal	Move communicator and antenna to location with stronger signal
HG: "no number"	No connection between communicator and analyzer	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

Appendix

Software Download via Direct Connection

Note: Only for authorized Blue I Water Technologies' distributors.

A specific software program and cable will be required to download software upgrades to communicator.

Required Software

1. Save the HGprs Center program from the distributor link on www.blueitechnologies.com. Customer Support → Industrial/Swimming pools → communications → wireless → modem & s/w download → choose relevant s/w

2. Double click on the (zip) folder and double click on setup.exe

3. Follow the on-screen directions pressing OK or continue when prompted

Connecting Cable

The cable is not a standard cable and must be made from an existing serial cable.

1. Cut a serial cable, leaving the serial connector and as much cable as possible, to expose the 9 internal wires

2. Using a multi-meter or test light determine which wires are connected to the #2, #3, and #5 pins on the serial connector.

3. Connect the #2, #3, and #5 wires to a 3-pin female connector as show in Figure 9.

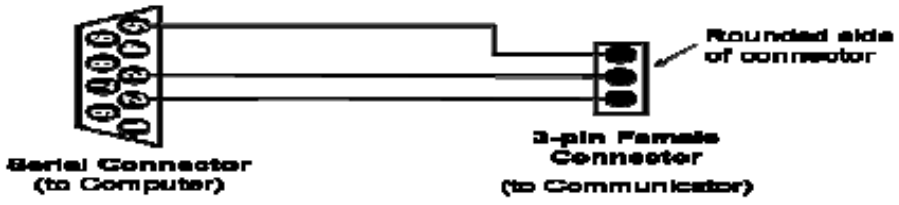

Figure 9: Schematic of Serial to 3-pin Connector Cable for Software Download

Installing the latest software version

1. Save the file "gprs.sc" from the distributors link of www.blueitechnologies.com.
    a. Save the file in the HGprs Center folder (generally found under c:\program files)
    b. If there is an existing grps.sc file, select yes to overwrite the existing file.

2. Connect the serial to 3-pin connector cable to the serial port of your computer and to the 3-pin connector on the communicator (inside on the top right)

3. Turn ON (or leave the power on) to the communicator

4. Disconnect the communication wire from the controller (2 pin connector; inside on bottom right)

5. Start the HGprs Center software

6. Select the appropriate com port (location of the serial connector)

7. Click Connect and confirm that the information about the communicator appears on program and the information is correct

8. Click Upload Local
    a. The program will automatically upload the gprs.sc file from the HGprs Center folder.
    b. Wait until the message "Please Wait" disappears

9. Wait to see the s/w "finish" message on the communicator and the HG Center

10. Cycle the power on the communicator (turn off for 10 seconds and then turn back on).

11. Confirm that the new software version is indicated on the communicator display

12. Verify that the message "in switch mode" appears

13. Disconnect the serial cable from the communicator

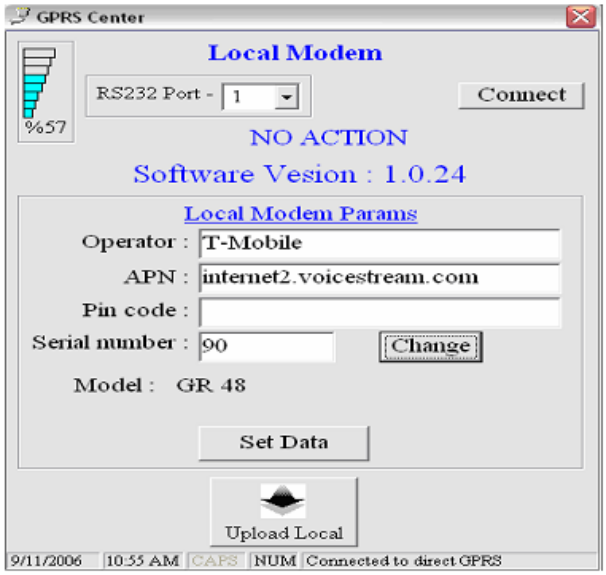

Figure 10: HGprs Center Program Main Window

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