



WaveData[®] VZCOM

Modem and Data Collection System



Environmental Data Meets the Digital World



True data, measure by measure



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Introduction

What is the WaveData® VZCOM Modem?

At INW, we believe that collecting data from remote sites should be simple. When data is instantly ready for analysis, there's more time for insights and decisions.

That's why our WaveData® VZCOM modems are engineered to transform remote data sites into real-time monitoring networks. Complete with affordable data plans and a user friendly Cloud interface, the VZCOM automatically pulls data without the need for cumbersome site visits or sample and test methods.

The VZCOM modem is a super low power device that runs for years on a single battery pack or virtually forever on solar power. Flexible programming allows your modem to collect data from a number of sensors and upload to the Cloud on your schedule. A built in datalogger retains the readings, protecting your data until it has been successfully uploaded to the Cloud.

System Requirements

The VZCOM modem is managed via the Internet using any Flash enabled browser.

Initial Inspection and Handling

Your VZCOM modem has been professionally packaged to arrive safely at your location. Upon receipt of your modem, inspect the shipping package for damage. If any damage is apparent, note the signs of damage on the appropriate shipping form. After opening the carton, look for concealed damage. If concealed damage is found, immediately file a claim with the carrier.

About this Manual

This manual is a comprehensive guide to installing and using your WaveData® VZCOM. For a simpler getting started guide, see the VZCOM Getting Started Manual, available from INW or from our web site at <http://inwusa.com/technical-library/manuals/>.

This comprehensive manual covers the following:

- **Installation** — takes you step-by-step through the setup and installation process, including setting up users on the server, configuring your sensors, configuring data collection and call-in schedules, mounting, and connecting sensors and power.
- **Testing** — details how to test your installation, so you can be assured it is working properly before leaving the installation site.
- **Operation** — includes a quick tour of the myINWdata.com data server, as well as detailed information on most day to day activities on the server, including accessing your data.
- **Domain Management** — provides information on managing users, clients, and modems.
- **Alarming and Notifications** — covers setting up alarming and notifications based on reading levels from your sensors.
- **Frequently Asked Questions** — contains answers to many of your most common questions in one, easy-to-access section.
- **Technical Specifications** — presents general specifications, modem diagram, RF sensitivity table, and wiring diagram.

Installation

Overview

There are several steps to setting up and installing your VZCOM network. In this section we will cover the following:

- Charging the battery
- Configuring users on myINWdata.com
 - Contact information
 - Changing passwords
- Configuring sensors with Aqua4Plus
 - Setting sensor address
 - Setting reporting units on the sensors
 - Starting background recording
 - Testing the network of sensors
- Configuring sensors on myINWdata.com
 - Defining sensors
 - Programming the data collection schedule
 - Setting up the call-in schedule
- Mounting modem
- Connecting to sensors
- Connecting to power



It is highly recommended that you configure your modem and sensors and run some preliminary testing in the office before going to the field.

Charging the Battery

For longest battery life, if you will be deploying your modem without a solar panel or other charging device in the field, be sure to fully charge the battery before deploying. Connect the 110V power adapter cable to the power connection on the modem. (See diagram under Mounting, later in this section.) Plug adapter into wall outlet and let charge overnight. This step is not needed if you will be charging the modem with a solar panel.

IMPORTANT: The internal battery switch must be turned “ON” in order for the battery to charge. See diagram in the mounting section of this manual.

Configuring Users on myINWdata.com



For immediate feedback from the modem Test Button, set up an email or phone number for your installer before he goes to the field. Using the Test button will be explained in the *Testing* section of the manual.

MyINWdata.com is the cloud-based control program for the VZCOM modem. You can access myINWdata.com using any Flash enabled browser. You will use myINWdata.com to manage users for your company.

Basic User Management

Users must be added and maintained by an administrator. See *Domain Management* later in this manual.

Contact Information and Passwords

All users can update their own contact information and passwords. After signing on to myINWdata.com, select the Accounts tab. Select User Manager from the list on the right, and then double click on the user name.



The User Edit window will appear. You can move back and forth between the pages by clicking the Next and Back buttons. When you have made all changes, click Next until you get to the last page, and then click Finish.

Contact Information

For immediate feedback during testing, set up contact information for your installer on the second page of the User Edit window.

You can choose to receive notification via your primary email address, your secondary email address, or via SMS (text message) on your mobile phone number.



It is often advantageous to use SMS rather than email in the field, especially if you are in remote areas with only 2G coverage where you can't receive emails but text messaging usually works fine.

The screenshot shows the 'User Edit' window for 'John Userland'. It contains the following fields and settings:

- User: John Userland
- Primary Email: ju@inwusa.com
- Alternate Email: richard@gohnsgon.com
- Voice Phone (Primary):
- Mobile Phone (SMS/Text): 123-456-7890
- Contact Settings:
 - System Notices: Ignore
 - Hardware Alerts: Ignore
 - Limit Alarms: Ignore

Below the 'Limit Alarms' dropdown, there is a list of options: 'Ignore', 'Primary Email', 'Alternate Email', and 'Mobile Phone'. The 'Ignore' option is currently selected.

Set Email and SMS/Text contact Information here.

From the Hardware Alerts box, select the method you want to use for notification when the Test button is pushed.

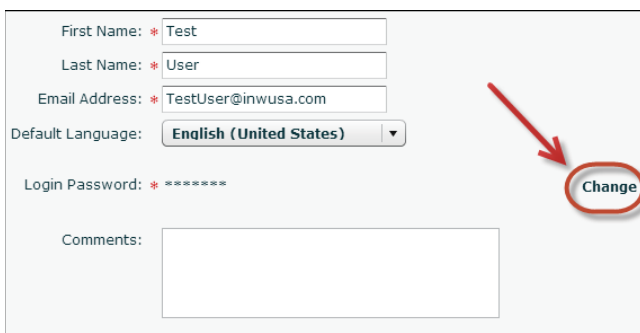
To receive an email message, select either Primary Email or Alternate Email.

To receive an SMS/Text message, select Mobile Phone.

Voice notifications are not available at this time.

Passwords

Your original password is set by your administrator. You can change your password from the Account Information page, which is the first page of the User Edit window. Click on “Change” on the right side. Enter and confirm your password.



The screenshot shows a web form for user editing. It includes input fields for 'First Name' (containing 'Test'), 'Last Name' (containing 'User'), and 'Email Address' (containing 'TestUser@inwusa.com'). There is a dropdown menu for 'Default Language' set to 'English (United States)'. A 'Login Password' field is masked with asterisks. A 'Comments' text area is at the bottom. On the right side of the form, there is a red arrow pointing to a button labeled 'Change'.

Configuring Sensors with Aqua4Plus

If you are using INW Smart Sensors, you will need to configure them before connecting them to the VZCOM modem. (Note: this does not apply to PT12 Pressure/Temperature Sensors. If you need to change configuration on a PT12, contact INW.) Use the Aqua4Plus Control Software on your PC to do this. Refer to your specific sensor manual and the Aqua4Plus manual for details.



These configurations cannot be changed remotely. Make sure your settings are correct before leaving the site.

Set sensor address

Each sensor on a VZCOM must have a unique sensor address. View or set this address from the Configure menu.

Set reporting units

You must set the reporting units you want in the sensor, using Aqua4Plus. You will also need to set the units in myINWdata.com (see details later in this manual). These MUST be set the same or your data will be faulty. For example, if the VZCOM is expecting temperature in degrees Fahrenheit but the sensor is set for Celsius, then the VZCOM data will be in Celsius but the label in the data file will be Fahrenheit.

Set the reporting units using Aqua4Plus. From the Configure Menu, select Advanced, and then select Direct Read Units. Note that not all channels have selectable units. If you do not see a channel listed, then that channel is fixed with the default reporting units.

Set background recording session (optional)

All INW Smart Sensors have the ability to record data internally. This is a great way to create backup data. Use Aqua4Plus to start the background recording. Note that your sensor must have internal batteries in order to do internal recording.

Test configuration

Once you have configured all your sensors, test your configuration using Aqua4Plus. This will confirm the following:

- You do not have any duplicate addresses.
- Your background recording sessions (if any) are running.
- Your wiring is correct.

Configuring Sensors on myINWdata.com

You will be using myINWdata.com to configure the modem and to upload and view data. Prior to installing your modem, set your initial programming on myINWdata.com. You will find programming details under *Operation* later in this manual.

You will want to:

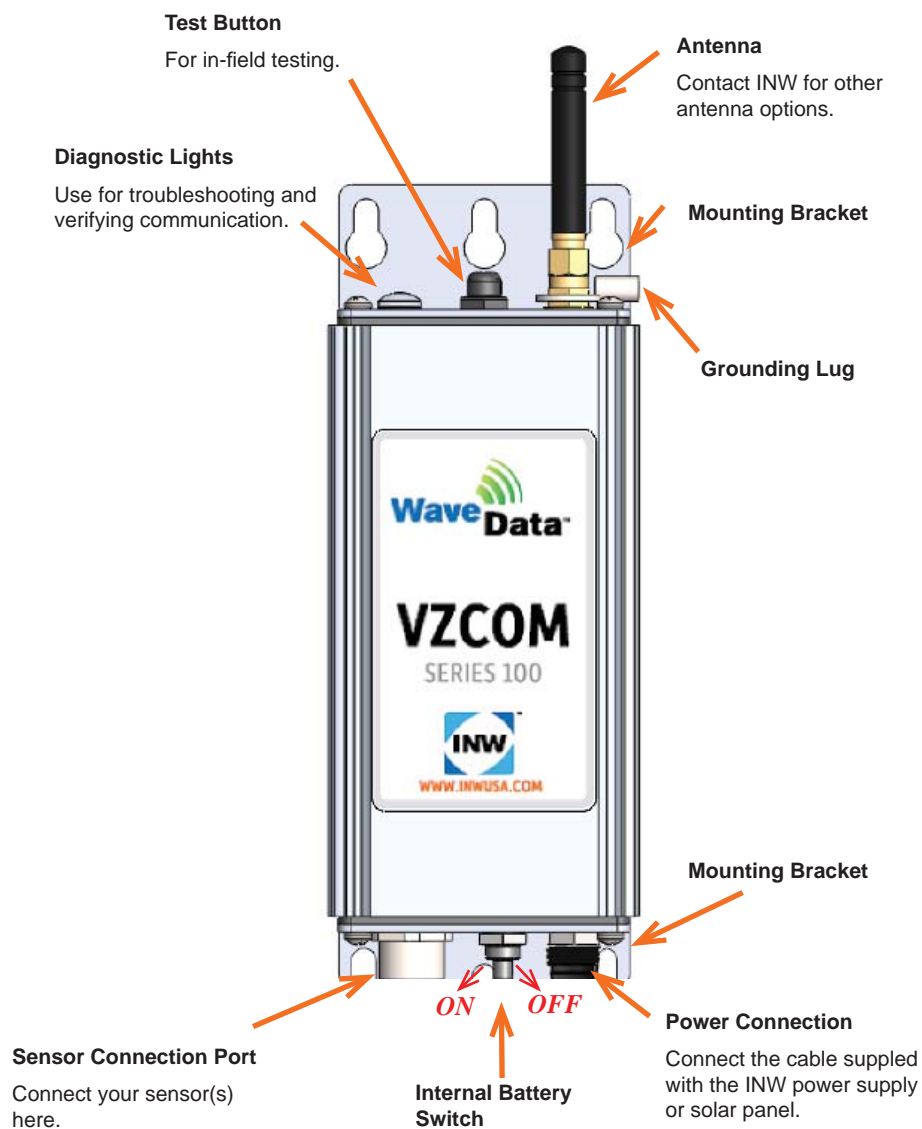
- Define the sensors you will be connecting.
- Program the data collection schedule.
- Set up the call-in schedule.



While you can make programming changes while in the field if you will have Internet connectivity on a Flash enabled browser, INW highly recommends doing the initial programming while in the office. After programming, connect all sensors to the VZCOM and verify that everything is working, before taking the equipment to the field.

Mounting

The VZCOM comes with a built-in mounting bracket and can easily be attached to any flat surface with a few screws. INW also has other mounting options available, including pole mounting kits for a variety of pole sizes as well as an in-well mounting option. Contact your INW sales representative for more details.

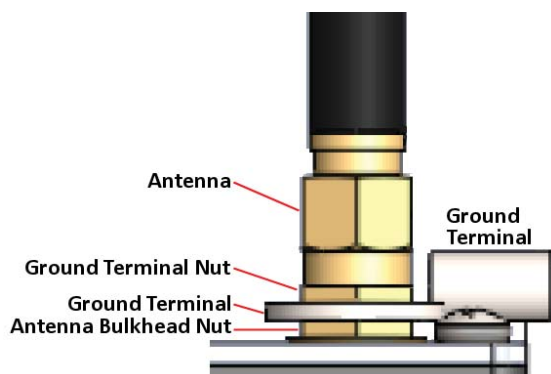


Grounding

Grounding does two things. First, it protects equipment and personnel from high power spikes. Second, it improves measurement accuracy by eliminating ground loops.

Connecting to the Grounding Lug

The VZCOM comes with a grounding terminal at the antenna terminal. Connect this grounding lug to your grounding system.*



1. Remove antenna.
2. Remove ground terminal nut.
3. Remove ground terminal.
DO NOT REMOVE ANTENNA BULKHEAD NUT!
4. Crimp ground terminal to a minimum 12-AWG wire and connect to your grounding system. *
5. Reassemble.



* INW recommends connecting to a 6 to 8 foot copper sheathed grounding rod that has been driven into the ground. This may not be adequate in low-conductive ground, such as sand or rocks. For these situations, refer to the U.S. Consumer Product Safety Commission, the National Electrical Code, and/or an electrical engineer with experience in grounding issues.

Safety Concerns

It is commonly known that when using electronic equipment, both personnel and equipment need to be protected from high power spikes that may be caused by lightning, power line surges, or faulty equipment. Without a proper grounding system, a power spike will find the path of least resistance to earth ground, whether that path is through sensitive electronic equipment or the person operating that equipment. In order to ensure safety and prevent equipment damage, a grounding system must be used to provide a low resistance path to ground.

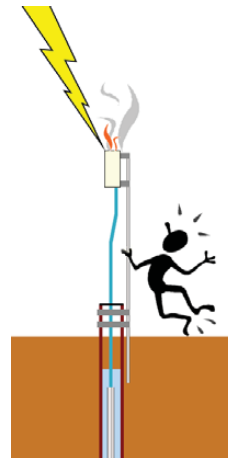
Ground Loop Effects

When using several pieces of interconnected equipment, each of which may have its own ground, problems with noise, signal interference, and erroneous readings may be noted. This is caused by a condition known as a Ground Loop. Because of natural resistance in the earth between the grounding points, current can flow between the points, creating an unexpected voltage difference and resulting erroneous readings.

Maximizing Safety and Minimizing Ground Loop Effects

Proper grounding and use of surge protectors are very important to ensure that your system provides a single low resistance path to ground. This will shunt high voltage spikes to ground, helping to prevent equipment damage and personal injury.

The single most important step in minimizing a ground loop is to tie all equipment (sensors, dataloggers, external power sources, housings, radios, cell modems, and any other associated equipment) to a single common grounding point.



Connecting to Sensors

Every INW Smart Sensor is supplied with a five pin weather-resistant connector on the cable. Connect this cable to the Sensor Connection Port on the VZCOM. For connecting more than one sensor you will need either a T-adaptor or a junction box. Contact your INW representative for details.

Connecting to Power

The VZCOM modem contains an internal, rechargeable battery. The VZCOM can run for short term monitoring on just the internal battery, but for longer term applications, you will also need either an external primary battery pack or a charging unit. INW has a solar charging unit designed to work directly with the VZCOM, giving you continual power. Every VZCOM also comes with a wall unit, which can be connected to charge the internal battery.

If you are using only the internal battery, you do not need to connect a power cable. If using an external primary battery or a charger, connect the supplied cable to the power connection.



Battery Switch

The battery switch disconnects the internal battery. Because this unit contains a Lithium-ion battery, you will need to be sure this switch is in the OFF position whenever shipping the unit or carrying it on an airplane. Be sure it is ON when using the unit.

Testing

Diagnostic Lights

The VZCOM is equipped with diagnostic lights to help in trouble-shooting. These lights can be seen through the lens on the top of the unit.

Table 1: Explanation of Diagnostic Lights

Light Pattern	Meaning
No lights	No power or not operating
Green light on steady for at least 4 seconds	Modem just powered up
Green light blinking every 8 seconds	Power on, modem idle
Green light blinking rapidly	Communicating with cellular network
Orange light blinking	Communicating with sensors

Power Cycling

As soon as power is applied to the modem, it will attempt to contact the myINWdata network. If connection is successful, it will download any updated configuration since the last time it communicated with the network.

Upon power on, the green diagnostic light will glow steadily for at least four seconds.

Test Button

In normal operation, the VZCOM only takes readings from the sensors and calls into the network on its scheduled basis. For example, you may have your schedules set to take a sensor reading once an hour and upload to the network once every 12 hours. When you are testing in the field, you may want faster response than this to be sure that your system has been configured correctly.

The test button on the VZCOM is designed to provide the VZCOM installer with information critical to deciding whether it is okay to leave the site. This button will provide a technician with most of the information to decide whether the installation has been a success or not.

If you press the test button on the top of the VZCOM, the following will happen:



- A reading will be taken from all sensors currently in the modem's program.
- The network will be contacted, the collected data uploaded, and any new configurations downloaded to the modem. If so configured, the server will also send an email or text message with this information. (See Configuring Users earlier in this manual.)



If you have made changes to the myINWdata.com server, you will want to press this button again to check and be sure your new settings are working correctly.

If you do not have Internet connectivity in the field or email/text messaging verification, you may want to call someone in your office to have them verify that the data is uploading as expected.

Important Installation Information

What does the button prove?

- The sensor is properly installed.
- The sensor has been properly connected to the VZCOM.
- There aren't any loose connections or sensor power faults.
- The readings are as expected, so the sensor is properly seated.
- There aren't any addressing issues between the Sensor and VZCOM – it has been addressed properly in Aqua4Plus.
- The sensor units have been properly specified in Aqua4Plus.

What doesn't the test button prove?

- The test button doesn't prove that the sensor is logging internally. For those applications using a datalogging sensor from INW as a redundant data backup, or for supplementary purposes, please validate that the sensor is logging using Aqua4Plus prior to leaving the site.
- The test button doesn't prove for sure whether the units the sensor is outputting are the units programmed on the VZCOM. Please **pay close attention** to the sensor data string for accuracy.



If any of the Aqua4Plus programming is left incomplete or inaccurate, another visit to the site will be required to complete installation. (See configuring Sensors with Aqua4Plus earlier in this manual.) Be sure everything is working to your satisfaction before leaving the site.

Careful installation and attention to the Test Button responses can give the installer significant confidence that the system is working as it should before leaving the site.

Further Testing Information

If you have Internet connectivity at the site or can call in to your office, you can also check the battery level and signal strength using myINWdata.com. Click on the Modem tab and then select the Status sub-tab.

Battery and Operating Voltage

- Internal Battery: When the internal battery is fully charged, VBat should be 11 - 13 volts.
- External Charger (solar, wall, external battery pack):
 - If VBat and VCom show about the same voltage, it is not charging. Note that on a cloudy, dark day, the charger may not be charging due to lack of sunlight.
 - If VCom is significantly higher than VBat (typically at least two to three volts higher), it is charging.
 - If VCom toggles between being similar to VBat and being higher, it is trickle charging.



Signal Strength

Checking the signal strength will confirm whether the modem has sufficient cellular coverage - as installed with antenna. The signal strength should register at least one bar, two bars or higher is preferred. If you have clear communication between the server and modem, any remaining VZCOM programming or configuration changes can be conducted over the web.

The signal strength should register at least one bar, two bars or higher is preferred.

> -65 dBm	=	5 bars
-74 to -65 dBm	=	4 bars
-84 to -75 dBm	=	3 bars
-94 to -85 dBm	=	2 bars
-104 to -95 dBm	=	1 bars
< -104 dBm	=	0 bars

Operation

Introduction

The power behind the VZCOM is the myINWdata.com network, available twenty-four hours a day from anywhere with an Internet connection and Flash enabled browser. MyINWdata.com provides instant access to your data, as well as control of all your modems.

Use myINWdata.com to define sensors on your network, set up data collection programs, and configure call-in schedules. The next time your modem calls in, it will grab the new configuration and immediately begin using it.

Your VZCOM uploads data to the Cloud on its programmed schedule. This data is immediately available on myINWdata.com for viewing as reports and graphs, as well as for export.

Administrators can also easily manage their modems, users, and client companies/sites.

Logging Onto the Server

To begin, open your Internet browser and go to myINWdata.com. You will be presented with a login screen. Enter your login name and password, and then click "Login."

User Login:

Username:

Password:

Forgot password? Click here: **Recover Password**

If you have lost your password, click here.

You are now on the modem management window. The following section of this manual gives information on how to add/edit sensor information, create/edit data collection schedules, view your modem information, and view your data in a simple format.

If you want to go directly to the more powerful data viewing options, click on the DataSight button in the upper right corner of the window.

Modem Viewer

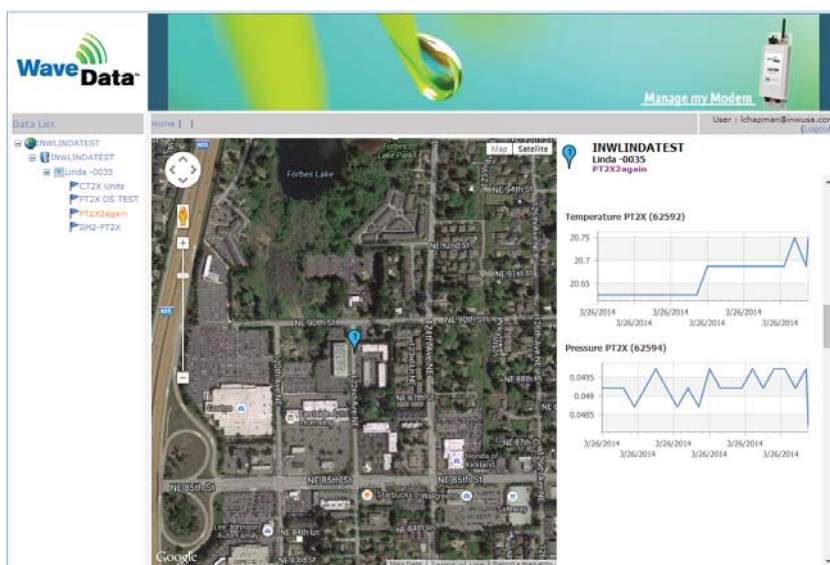
Modem Name:

Installed Sensors for Modem-0008

Bus Addr:	Name:	Type:	Serial #:	Retries:	Timeout:	Tag:	Power:	Radio:
2	PRESS	PRESS TEST	0	1	1000	0068		
3	ct2x3	CT2X Basic	0	1	125	0065		
1	pH	TempHion - f/w < 2.5	0	1	125	0066		
2	PT2X-2	PT2X Basic	0	1	125	0069		
2	BV	PT2X Basic	0	1	125	0061		

DataSight

At this point, the DataSight window will display. DataSight gives you flexibility in displaying your data in various ways.



Quick Tour

Sensors

Click on the Sensors sub-tab.

Sensors									
Installed Sensors for Modem-0008									
Bus Addr:	Name:	Type:	Serial #:	Retries:	Timeout:	Tag:	Power:	Radio:	
2	EDS test sens	PT2X Basic	21105468	1	125	0004			
3	paul	PT2X Basic	21193857	1	125	0005			
Found 2 Sensors									
Sensor Channels: EDS test sensor									
Register:	Channel Name:	Units:	Enabled	Upper Limit:	Lower Limit:	Delta Limit:	Enable Limit		
62592	Temp	degF	<input checked="" type="checkbox"/>	0	0	0	<input type="checkbox"/>		
62594	Inches (Pressure)	In H2O	<input checked="" type="checkbox"/>	0	0	0	<input type="checkbox"/>		

The top panel on the Sensors sub-tab displays a list of all sensors that are assigned to this modem, including various information about each sensor, such as the bus address, the name given to the sensor, the sensor type, etc.

The bottom panel on the sensor tab displays information about the sensor highlighted in the top panel, including such things as channel names, units, and whether or not the channel is enabled.

The Sensor sub-tab can also be used to add, edit, or delete sensors, which will be addressed later.

Data Collection Program

Click on the Data Collections sub-tab.

Program History for Modem TEST1718-2

Tag ID:	Name:	Date Created:	Active:	# Events:	Comments:
46	MyDailyCollection	01/28/2013 14:00:31	true	2	

Found 1 Programs Show Inactive Programs ☐

Program Actions for Tag #: 46

Action Type:	Device:	Days Run:	Time/Freq:	Event Type:
Record Data	PT2X7 (33)	SMTWTFSS	Every 5 minutes	Repeats
Record Data	CT2X3 (31)	SMTWTFSS	Every 15 minutes	Repeats

The Data collection program tells the modem when to collect data from the sensors.

The top panel on the Data Collection sub-tab shows information about the current collection program. There can only be one active program at any one time, though it may have many actions.

The bottom panel shows the details about the program shown in the top panel, including the action type(s) and when they will occur.

The Data Collection sub-tab can also be used to add, edit, or delete data collection programs, which will be addressed later.

**Warning!**

If any device in the lower panel says N/A, this is an indication that a setup change was made on your sensor(s) and you will need to reset the data collection program. See further information under Editing Sensors.

Call-in Schedule

Click on the Call-in Schedule sub-tab.

Tag ID:	Name:	Date Created:	Active:	# Events:	Comments:
4	EDS test	01/17/2013 15:29:19	true	2	

Found 1 Schedules Show inactive Schedules ☐

Action Type:	Days Run:	Time/Freq:	Event Type:
Check-In	SMTWTFS	Every 1 hour at 5 mins past the hour	Repeats
Report	SMTWTFS	Every 0 minutes	Repeats

A schedule tells the modem when to call the VZCOM server and upload its data. The modem will also download any configuration changes made on the server since the last time it called in.

The top panel on the Call-in Schedule sub-tab shows information about the current schedule. There can only be one active schedule at any one time, though it may have many actions.

The bottom panel shows the details about the schedule shown in the top panel, including the action type(s) and when they will occur.

The Call-in Schedule sub-tab can also be used to add or edit schedules, which will be addressed later.

Modem Status

Click on the Status sub-tab.

Module Date:	Status:	Flags:	Config#:	Upload#:	Logging#:	DevList#:	AppCt#:	VCom:	VBat:	TEMP:	CSQ:
08/04/14 09:55:38	0	--RAC-	49	64	102	73		14.867V	0.000V	22.956C	-79 dBm
08/04/14 08:43:38	0	--RAC-	49	64	102	73		14.934V	0.000V	22.884C	-79 dBm

Various status information is shown here, including date/time of the status report, supply power level, (VCom and/or VBat will show power depending on type of power being used.), temperature in the enclosure, and the signal strength. There is also a Flags column that will indicate such things as power cycling or low battery. Roll your mouse over the flags to get a description of their meanings.

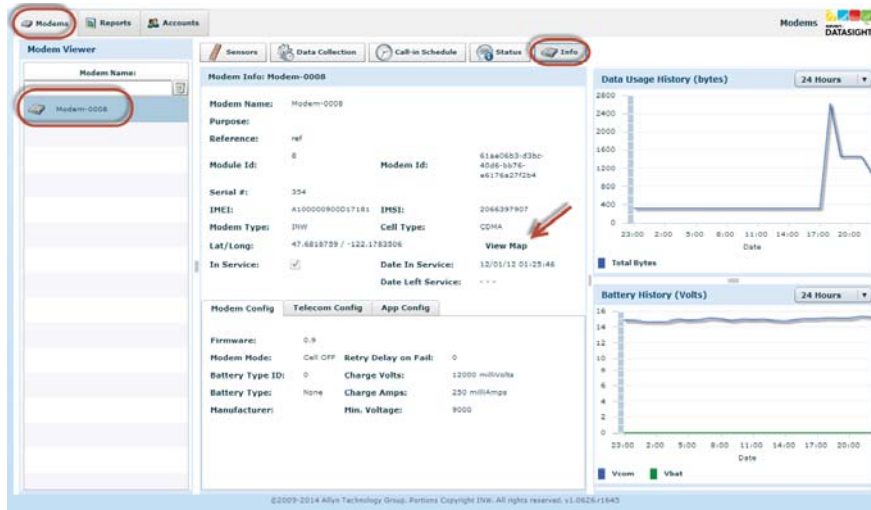
View older status messages by using the arrow keys and date/time picker above the messages.

For further details on the Status sub-tab, see *Understanding the Status Window* later in this manual.

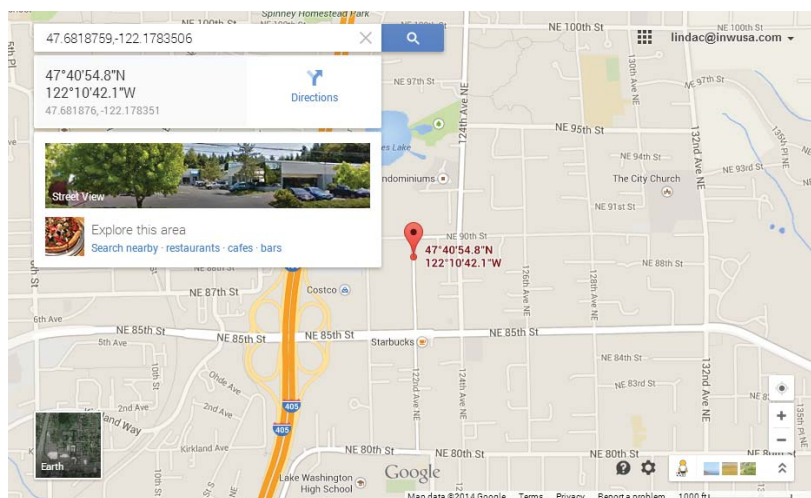
Modem Information

- Click on the Modems tab.
- Click on your modem in the left panel.
- Click on the Info sub-tab.

General information about your modem is shown here. For details on changing this information see *Editing Modem Information* in the *Domain Management* section of this manual.



If the latitude and longitude have been entered into your modem, click on View Map. A map will display with a pin at that location.



Reports

Click on the Reports tab.

Click on your modem. Your data is displayed in a tabular format.

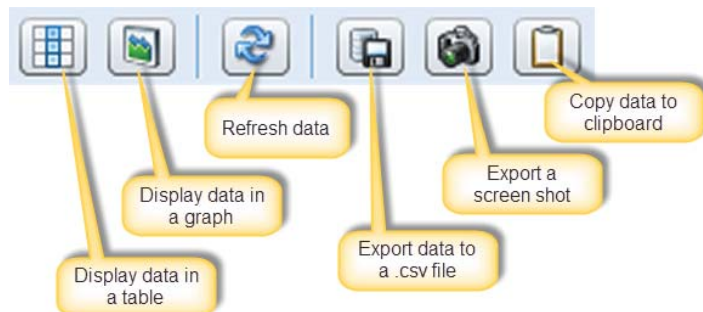
Reading Date	Conductivity (mg/L)	Temperature (degC)	Pressure (H2O)	Salinity (PSU)
01/17 15:30:04	0.000	0.000	0.032	0.000
01/17 15:15:04	0.000	0.000	0.030	0.000
01/17 15:00:04	0.000	0.000	0.029	0.000
01/17 14:45:04	0.000	0.000	0.029	0.000
01/17 14:30:04	0.000	0.000	0.043	0.000
01/17 14:15:04	0.000	0.000	0.032	0.000

Click on the graph button to display your data in a graph.



By default, the server displays data for the last hour, ending at the current date and time. To change this range, select the ending date and time you desire. Select a time window from the drop-down box (from 1 hour to 30 days), and then click the Search button.

Report Button Options



For further details on reports, see *Understanding Reports* later in this manual.

For more advanced display options, click on the



button in the upper right of the window.

Adding, Editing, and Deleting Sensors

Use the Sensors sub-tab to add, edit, and delete sensors assigned to your modem.

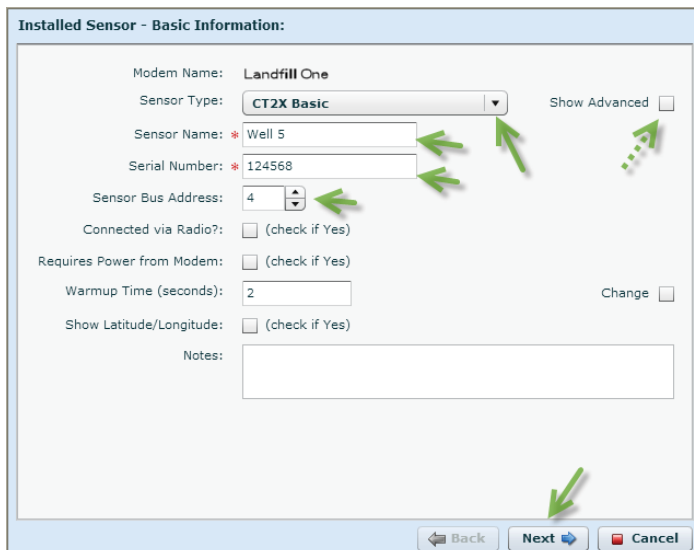
Click on the Modems tab.

Click on your modem in the left panel.

Click on the Sensors sub-tab.

Adding a Sensor

To add a new sensor, click the  button. The first sensor window will display.



- From the Sensor Type drop-down box, select your sensor type. (If you don't see your sensor in the list, click on the Show Advanced box to show more options.)
- Enter a name for your sensor.
- Enter the serial number.
- Select the Sensor Bus Address for your sensor (Modbus address or Slave ID.)
- If you will be using radios, contact INW for further details.
- If you need the modem to power your sensors, check the Requires Power from Modem box. (Most INW sensors come with internal batteries, but the modem can power those that don't.)
- If you want to change warm-up times, contact INW.
- Click Next.

The second sensor window will display.

Installed Sensor - Channel Selection:


Sensor Name: Well 5

Sensor Type: CT2X Basic

Selected Channels:

Register:	Channel Name:	Units:	User Units:	Enabled
62592	Temperature	degC	degC	<input checked="" type="checkbox"/>
62594	Conductivity (Linear)	uS/cm	uS/cm	<input checked="" type="checkbox"/>
62596	Conductivity (Non-Linear)	uS/cm	uS/cm	<input type="checkbox"/>
62598	Pressure	PSI	PSI	<input checked="" type="checkbox"/>
62600	Salinity	PSU	PSU	<input checked="" type="checkbox"/>
62602	TDS	mg/L	mg/L	<input type="checkbox"/>

Next Back Cancel

- If you want to change the name on a channel, click the channel name and type in your preferred name.
- If you want to change the engineering units on the channels, click the  icon to the right of the Units value.



Note: The units MUST match those set on your sensor itself. To change units on the sensor itself, see the sensor manual for your sensor. Not all sensors have more than one type of unit. If this is the case, there will not be an icon for changing it.

- The User UOM column is only used for Aquistar® GDL Dataloggers. If you are using a GDL and have set the user defined units on the GDL, you can enter the name of those units in the column. Ignore this column for all other sensor types. (See the GDL manual for further details on user defined units.)
- Checkmark all channels for which you want to collect data.
- Click Next.

The third sensor window will display.

Installed Sensor - Channel Limits:

Sensor Name: Well 5
Sensor Type: CT2X Basic

Enabled Channel:

- Temperature
- Conductivity (Linear)
- Pressure
- Salinity

Limit Settings:

Enable Limits: ☒ (check if Yes)

High Alarm: 50

High Warning: 40

Low Warning: 10

Low Alarm: 5

Update

Back Next Cancel

This window is for use in setting alarm limits. If you are using alarm limits, see *Alarming and Notifications* later in this manual.

Click Next.

The final sensor window will display.

Installed Sensor - Channel Summary:

Sensor Type: CT2X
Sensor Name: * Well 5
Serial Number: * 123654
Sensor Bus Address: 2
Connected via Radio?: NO
Notes:

Retry Count: 1
Retry Timeout: 125 (mS)
Power from Modem: NO
Power-on Time: 2 (seconds)
Warmup Time: 2 (seconds)

Register:	Channel Name:	Units:	User Units:	Enabled
62592	Temperature	degC		Y
62598	Pressure	PSI		Y
62594	Conductivity (Linear)	uS/cm		Y
62596	Conductivity (Non-Linear)	uS/cm		N
62600	Salinity	PSU		Y
62602	TDS	mg/L		N

Channel Name:	High Alarm:	High Warning:	Low Warning:	Low Alarm:	Delta Limit:	Enabled
Temperature	50	40	10	0	0	Y
Conductivity (Linear)	0	0	0	0	0	N
Pressure	0	0	0	0	0	N

Back Save Cancel

This is a summary window, showing the settings you have selected. If you need to make any changes, click the Back button, otherwise click Save.

Your new sensor will now display on the Sensors tab with details in the lower panel.

Sensors Data Collection Call-in Schedule Status Info

Installed Sensors for Modem-0008


Bus Addr:	Name:	Type:	Serial #:	Retries:	Timeout:	Tag:	Power:	Radio:
2	EDS test sens	PT2X Basic	21105468	1	125	0004		
3	paul	PT2X Basic	21193857	1	125	0005		

Found 2 Sensors


Sensor Channels: EDS test sensor

Register:	Channel Name:	Units:	Enabled	Upper Limit:	Lower Limit:	Delta Limit:	Enable Limit
62592	Temp	degF	<input checked="" type="checkbox"/>	0	0	0	<input type="checkbox"/>
62594	Inches (Pressure)	in H2O	<input checked="" type="checkbox"/>	0	0	0	<input type="checkbox"/>

Editing a Sensor

To edit an existing sensor, click on the sensor, and then click the  button. The first sensor window will display. Navigate through the same four windows as when adding a sensor, making any changes you need.

Deleting a Sensor

To delete an existing sensor, click the  **Delete** button.

When Do These Changes Take Effect?

These changes are made on the server, not directly on the modem. These changes will be updated on the modem the next time it checks in with the server, which happens in the following ways:

- When the modem sends a regularly scheduled report or status.
- When the modem is power cycled.
- When the test button on the modem is pressed.

See  **Warning!** on next page.



Warning!

If you make any changes to a sensor that is included in your data collection program, you **MUST** reset your data collection program. If you go to the Data Collection Tab, you will see that your sensor in the device column now says N/A.

For example, if your collection program has a device named PT2X2, the Data Collection tab would display as:

Program Actions for Tag #: 23			
Action Type:	Device:	Days Run:	Time/Freq:
Record Data	PT2X2 (9)	SMTWTFS	Every 5 minutes

If you make a change to your sensor named PT2X2 on the sensor tab, and then go back to the Data Collection Tab, it would now display as:

Program Actions for Tag #: 23			
Action Type:	Device:	Days Run:	Time/Freq:
Record Data	N/A	SMTWTFS	Every 5 minutes

This is because the modem may still have data in it that came from that sensor. When you change the sensor information, the modem and server have no way of telling if this is a new sensor or not. In order to correctly process the data it receives from the modem, it treats this changed sensor as a new sensor. To correct the collection program, click the Edit button on the Data Collection tab. You will need to delete the action that says N/A and re-enter it. (See the Adding, Editing, and Deleting Data Collection Programs section for details on editing a program.)

Adding, Editing, and Deleting Data Collection Programs

The Data Collection program defines when the modem will read the sensors connected to it. It can also define when to turn power on or off to the sensor bus. (Contact INW if you need information on these power activities.)

Only one program is active at a time, though older programs can be viewed by clicking the Show Inactive Programs checkbox.

Use the Data Collection sub-tab to add or edit programs for your modem.

Click on the Modems tab.

Click on your modem in the left panel.


Click on the Data Collection sub-tab

Adding a Data Collection Program

To add a new program, click the  button in the upper right.

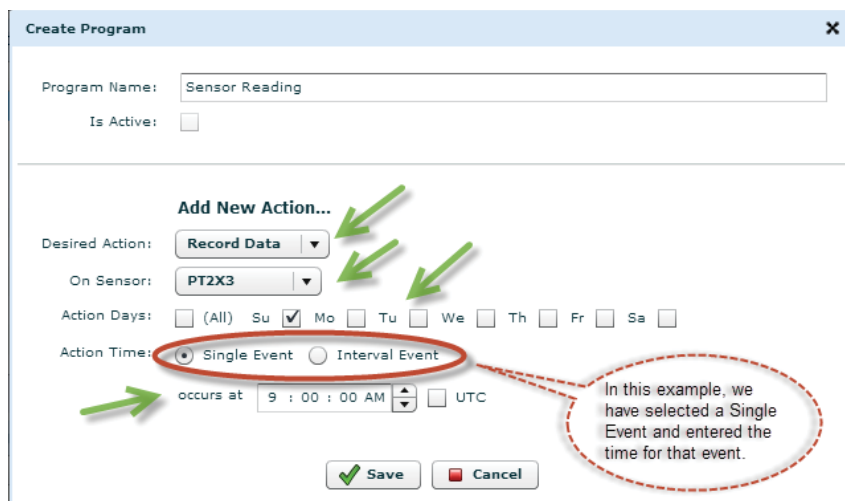


The Create Program window will open.

- Enter a name for your program.
- Click the  button on the Program Actions line to add an action.

- From the first drop-down box, select the desired action.
 - Power On: Turns on power to the bus. (Contact INW if you want to use this option.)
 - Power Off: Turns off power to the bus. (Contact INW if you want to use this option.)
 - Record Data: Takes and records a reading from the sensor.
- From the second drop-down box, select the sensor. (Modem records modem temperature and voltage.)
- Checkmark the days on which to perform this action.
- Select whether this is an event that will happen once a day at a particular time or an event that will happen repeatedly at a specific interval.
- If selecting an interval event, select the interval in seconds, minutes, or hours.
- Click Save to save the action.

To add additional actions, click the  button on the Program Actions line again.



If you want to display the time on the schedule in UTC, then enter the time here in LOCAL time and then checkmark the UTC check box.

2 : 00 PM ☒ UTC

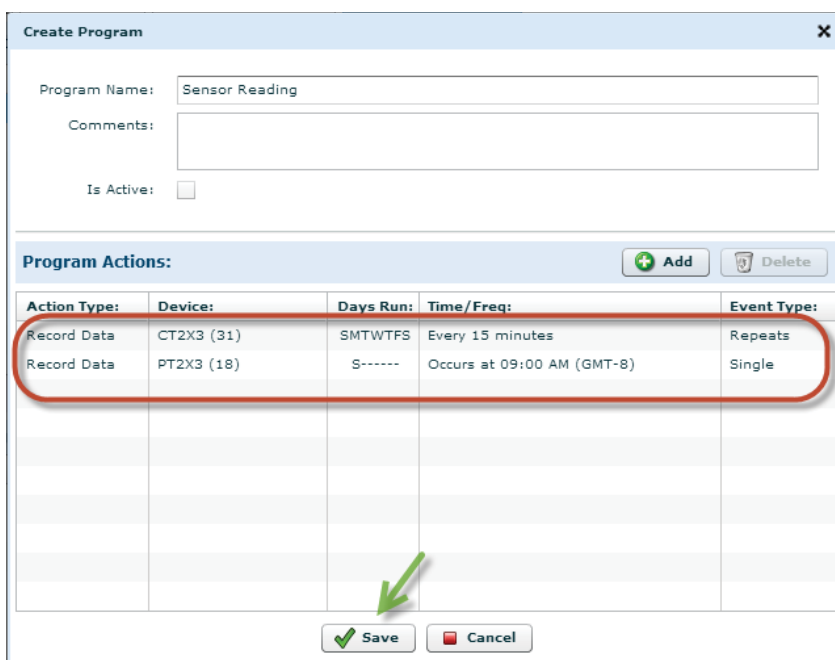
The time will be displayed on the schedule as:

Time/Freq:
Occurs at 21:00Z

After clicking save on the Action box, your actions will be listed in the lower panel. You can continue to add actions.

If you want to delete an action, click on the actions, and then click the  button.

When you are done defining your program, click the  button to save it.




Action Type:	Device:	Days Run:	Time/Freq:	Event Type:
Record Data	CT2X3 (31)	SMTWTFS	Every 15 minutes	Repeats
Record Data	PT2X3 (18)	S-----	Occurs at 09:00 AM (GMT-8)	Single

Editing a Data Collection Program

To edit an existing program, click on the program, and then click the  button.

Deleting a Data Collection Program

To delete an existing program, click the  button.

When Do These Changes Take Effect?

These changes are made on the server, not directly on the modem. These changes will be updated on the modem the next time it checks in with the server, which happens in the following ways:

- When the modem sends a regularly scheduled report or status.
- When the modem is power cycled.
- When the test button on the modem is pressed.

Adding and Editing Call-in Schedules

The Call-in Schedule defines when the modem will Check In (send a status message and pick up any new configurations) or when it will Report (send a status message, upload any collected data, and pick up any new configurations).

It can also define when to change the modem to standby or off mode. (Contact INW if you need information on these modes.)

Only one schedule is active at a time, though older schedules can be viewed by clicking the Show Inactive Schedules checkbox.

Use the Call-in Schedule sub-tab to add or edit schedules for your modem.

Click on the Modems tab.

Click on your modem in the left panel.

Click on the Call-in Schedule sub-tab

Adding a Call-in Schedule

To add a new Schedule, click the  button in the upper right.



The Create Schedule window will open.

Create Schedule [X]

Schedule Name:

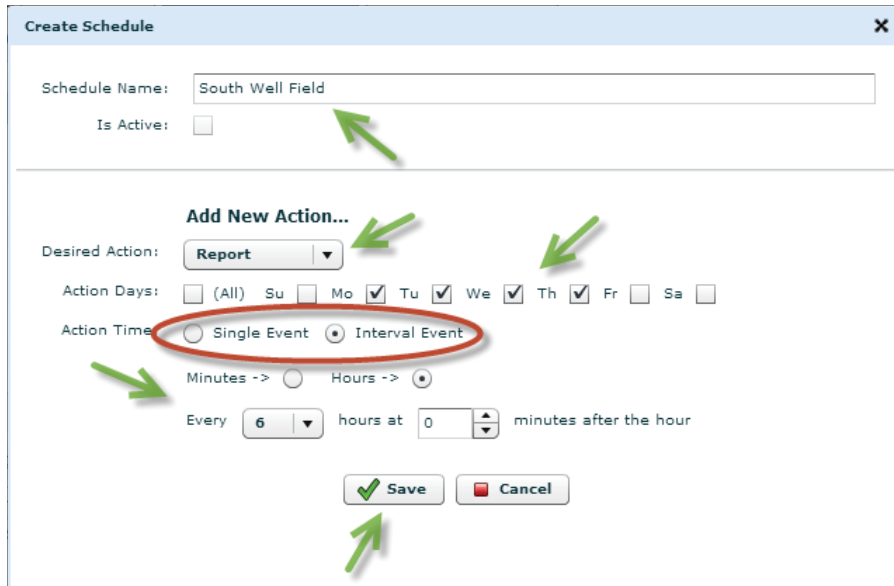
Comments:

Is Active: ☐


Schedule Actions:

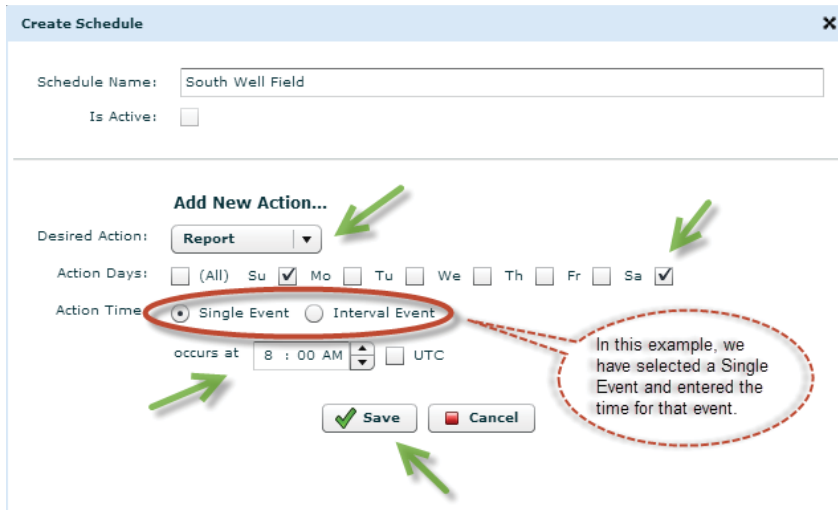
- Enter a name for your schedule.
- Enter comments, if you want.

- Click the  button on the Schedule Actions line to add an action.



- From the drop-down box, select the desired action.
 - Check-In: Calls server and picks up any new configurations. DOES NOT upload data.
 - Report: Calls server, uploads data to server, and picks up an new configurations.
 - Cell Standby: Set modem chip to quiescent mode - modem chips stays on when not transmitting. Use this only if you are going to be calling in once a minute or more and need rapid response - uses more power.
 - Cell Off: Set modem chip off when not transmitting. This is the most power efficient mode, though it may take a few seconds to connect to the cellular network. This is the default mode.
- Checkmark the days on which to perform this action.
- Select whether this is an event that will happen once a day at a particular time or an event that will happen repeatedly at a specific interval.
- If selecting an interval event, select the interval in minutes or hours.
- Click Save to save the action.

To add additional actions, click the  button on the Schedule Actions line again.



If you want to display the time on the schedule in UTC, then enter the time here in LOCAL time and then checkmark the UTC check box.

2 : 00 PM ☒ UTC

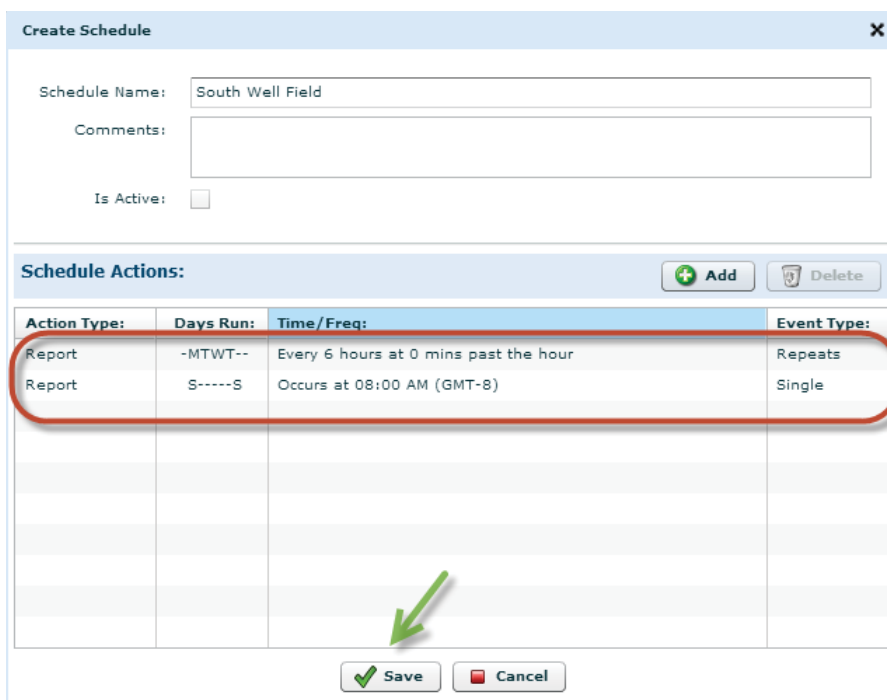
The time will be displayed on the schedule as:

Time/Freq:
Occurs at 21:00Z

After clicking save on the Action box, your actions will be listed in the lower panel. You can continue to add actions.

If you want to delete an action, click on the action, and then click the  button.

When you are done defining your schedule, click the  button to save it.



Action Type:	Days Run:	Time/Freq:	Event Type:
Report	-MTWT--	Every 6 hours at 0 mins past the hour	Repeats
Report	S-----S	Occurs at 08:00 AM (GMT-8)	Single

Editing a Call-in Schedule

To edit an existing schedule, click on the schedule, and then click the  button.

When Do These Changes Take Effect?

These changes are made on the server, not directly on the modem. These changes will be updated on the modem the next time it checks in with the server, which happens in the following ways:

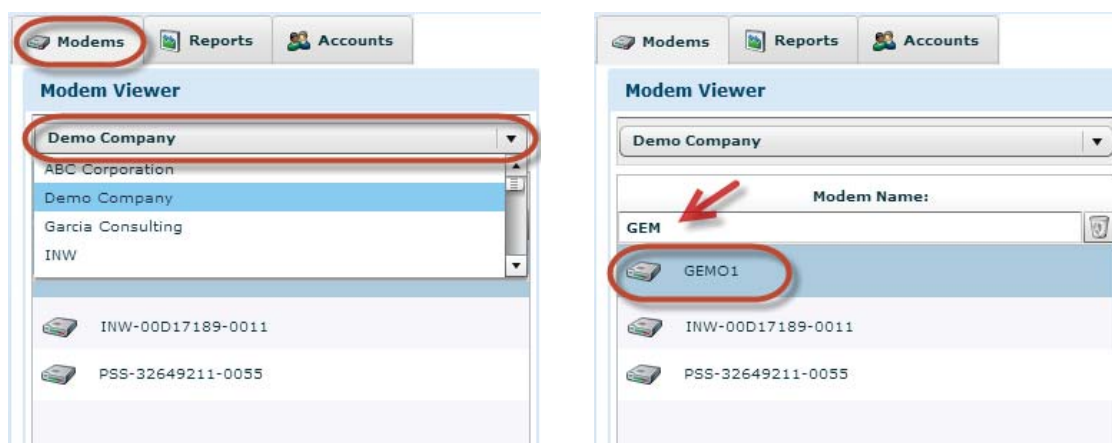
- When the modem sends a regularly scheduled report or status.
- When the modem is power cycled.
- When the test button on the modem is pressed.

Understanding the Status Window

The Status Window displays various status information about your modem, such as when it called in last, any notification flags, battery power level, and signal strength.

Accesssing the Status Window

- Click on the Modems Tab.
- If your company is not in the Company box, then click the drop-down arrow and select your company.
- Click on your modem. If there is a large list of modems, you can search for your modem by typing a few letters or numbers from the modem name in the Search box.



Explanation of Display

Click on the Status sub-tab to display the Status window. The Status window displays the 50 status reports at one time, with the most recent at the top. Click on the Module Date column header to reverse the sort order of these 50 records. (Note: You may have to scroll down to see all 50 records.) See *Navigating the Status Window* below for details on selecting different sets of records.

Module Date:	Status:	Flags:	Config#:	Upload#:	Logging#:	DevList#:	AppCfg#:	VCom:	VBat:	TEMP:	CSQ:
09/04/14 09:00:38	0	--RAC-	49	64	102	73		14.867V	0.000V	22.906C	-79 dBm
09/04/14 08:45:38	0	--RAC-	49	64	102	73		14.954V	0.000V	22.884C	-79 dBm

Table 2: Explanation of Status Window Columns

Column	Description
Module Date	Date and time modem last called into the server. Status information is as of this point in time.
Status	This should always be zero.
Flags	Notification flags. Roll the mouse over the flag for specific information. Most common flags are: <ul style="list-style-type: none"> P - There was a power cycle. B - Low battery. If the battery is low, the line will also be highlighted in pink. R - A Report is ready to upload and will upload momentarily. A - The modem has an active data collection program. C - Modem is checking in. If there have been changes to that modems configuration on the server, it will be downloaded at this time.
VCom ¹	This is the adjusted voltage the modem is actually using. The modem examines both the battery and the auxiliary input, selects the higher one, and adjusts to its needs. This voltage is not the auxiliary input voltage.
VBat ¹	This is the voltage level in the internal rechargeable batteries.
Config# ²	Modem configuration tag
Upload# ²	Call-in (upload) schedule tag
Logging# ²	Data Collection program tag
DevList# ²	Device List tag
TEMP	Internal temperature in the enclosure
CSQ	Signal Strength

1 Voltage Levels:

Internal Battery: When the internal battery is fully charged, VBat should be 11 - 13 volts.

External Charger (solar, wall, external battery pack): If VBat and VCom show about the same voltage, it is not charging. Note that on a cloudy, dark day, the charger may not be charging due to lack of sunlight. If VCom is significantly higher than VBat (typically at least two to three volts higher), it is charging. If VCom toggles between being similar to VBat and being higher, it is trickle charging.

2 Whenever a modem, call-in schedule, data collection program, or sensor is changed, a new "tag" number is created. The server uses this to properly process incoming data. You will notice on Sensors, Call-in Schedule, and Data Collection tabs, there is a column that shows the Tag for the current configuration. These are the tags reported in the status columns. (In some older versions, these columns may be titled CFGT, SCHK, PGMT, and DEVT, respectively.)

Navigating the Status Window

Use the navigation bar at the top of the window to select the reports you want to view or to export.

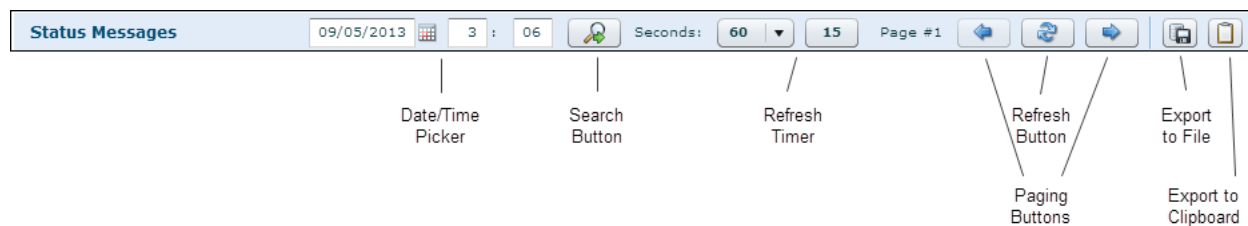



Table 3: Explanation of Navigation Bar Controls on Status Window

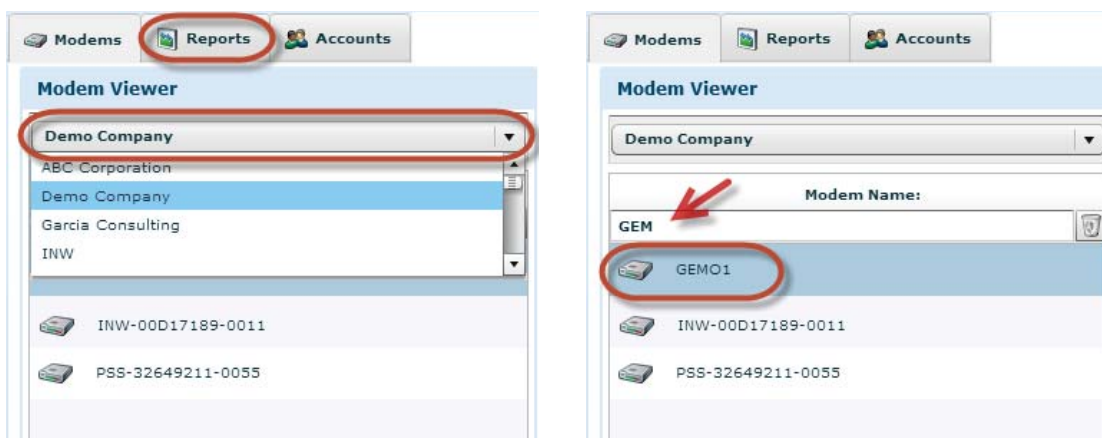
Control	Explanation
Date/Time Picker	To select a specific set of reports, use the date/time picker to select the ending day and time for your set. Click the Search button. The server will display the last 50 reports up to the date/time selected. The refresh count-down time will automatically pause, so you can view your status reports.
Search Button	Searches for the 50 status records prior to the date/time set in the date/time picker.
Refresh Timer	<ul style="list-style-type: none"> Use the Refresh Timer drop-down to set the length of time between automatic data refreshes. Select 60, 30, or 10 seconds. The count-down box to the right of the Refresh Timer displays remaining time until next automatic refresh. Click the button to temporarily stop refreshes. The button will now display the paused icon - .
Refresh Button	Click the Refresh Button to immediately refresh the data from the server.
Paging Buttons	Click the Paging Buttons to move forward or backwards 50 reports.
Export to File	Click the Export to File Button to export to a .csv (comma separated values) file. This will export the 50 reports currently showing.
Export to Clipboard	Click the Export to Clipboard Button to export to the clipboard. This will export the 50 reports currently showing in .csv (comma separated values) format and can be pasted into other applications or documents.

Understanding Reports

The Reports Window displays the actual data that has been uploaded from the sensors via the modem.

Accessing the Reports Window

- Click on the Reports Tab.
- If your company is not in the Company box, then click the drop-down arrow and select your company.
- Click on your modem. If there is a large list of modems, you can search for your modem by typing a few letters or numbers from the modem name in the Search box.



Explanation of Display

By default the server displays data for the last hour, with the most current data at the top. If you want the oldest data at the top, click the Reading Date column header to change the display order. If you cannot see all the data, use the scroll bar on the right. See *Navigating the Reports Window* below for details on selecting different sets of readings.

Data Report							
Date Ending:		09/06/2013	12 : 07	History:	1 hour		
Reading Date	CT2X3 Linear Conductivity (uS/cm)	CT2X3 Salinity (PSU)	PT2X2 Temp (degC)	PT2X2 Press (PSI)	Temperature Modem (degC)	Vbattery Modem (Volts)	Vcommon Modem (Volts)
09/06/13 12:05:05	87.775	0.047					
09/06/13 12:05:03			23.312	-0.005			
09/06/13 12:05:00					24.119	12.600	16.065
09/06/13 12:04:05	87.769	0.047					
09/06/13 12:04:03			23.312	-0.005			
09/06/13 12:04:00					24.229	12.609	16.538

Reading Date Column

The first column contains the date and time of the reading. By default the most current data displays at the top. If you want the oldest data at the top, click the Reading Date column header to change the display order.

Reading Date
09/06/13 12:05:05
09/06/13 12:05:03
09/06/13 12:05:00
09/06/13 12:04:05
09/06/13 12:04:03
09/06/13 12:04:00

Data Column Headers

Each data column header displays the Sensor Name, Channel Name, and Display Units. In this sample, the sensor was named PT2X2. The channel being displayed was the channel named Temp. The display units were degrees Celsius.

PT2X2 Temp (degC)

Data Columns



The data columns should appear in the same order as they are defined on the sensor. If you have only one sensor, your data will display as shown to the right.

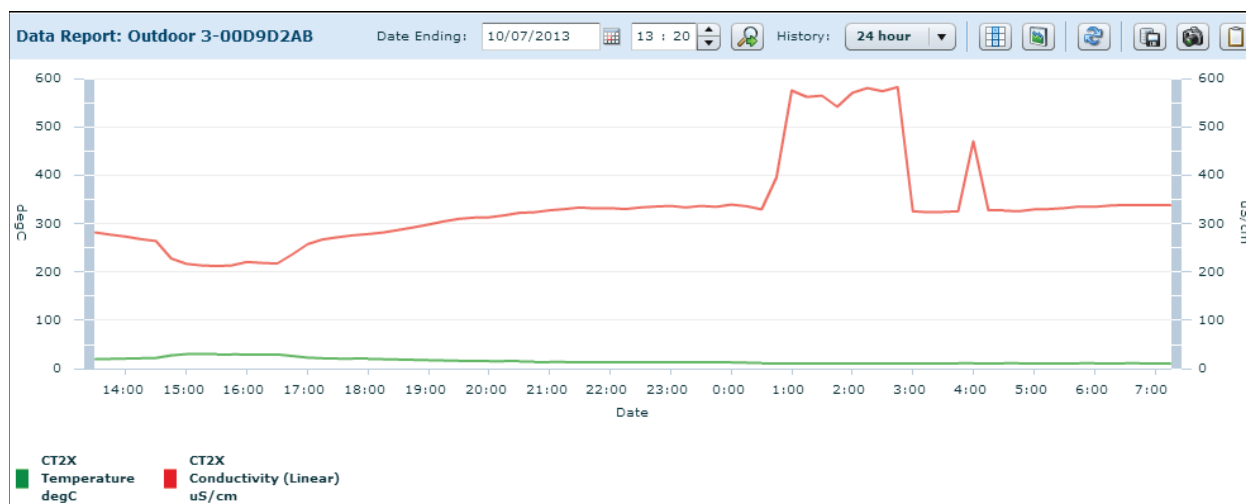
Reading Date	PT2X2 Temp (degC)	PT2X2 Press (PSI)
10/04/13 14:04:03	21.312	-0.023
10/04/13 14:02:03	21.312	-0.023
10/04/13 14:00:03	21.312	-0.023
10/04/13 13:58:03	21.312	-0.024
10/04/13 13:56:03	21.312	-0.023
10/04/13 13:54:03	21.312	-0.023

If you are displaying more than one sensor, the data for each sensor will appear on a separate line with its own date/time stamp. When taking readings from several sensors, the modem will read each sensor in turn. It may take a few seconds to read a particular sensor, so the time stamp may be slightly different for each sensor. In the sample below, there are two sensors, CT2X3 and PT2X2, each with two data columns. The modem was programmed to collect data once a minute - in this sample that would have been at 12:04 and 12:05. It finished collecting the 12:04 data from the PT2X2 at 12:04:03 and displayed that data on that line. It then finished collecting the 12:04 data from the CT2X3 at 12:04:05 and reported its data on that line. Data was reported similarly for the 12:05 reading.

Reading Date	CT2X3 Linear Conductivity (uS/cm)	CT2X3 Salinity (PSU)	PT2X2 Temp (degC)	PT2X2 Press (PSI)
09/06/13 12:05:05	87.775	0.047		
09/06/13 12:05:03			23.312	-0.005
09/06/13 12:04:05	87.769	0.047		
09/06/13 12:04:03			23.312	-0.005

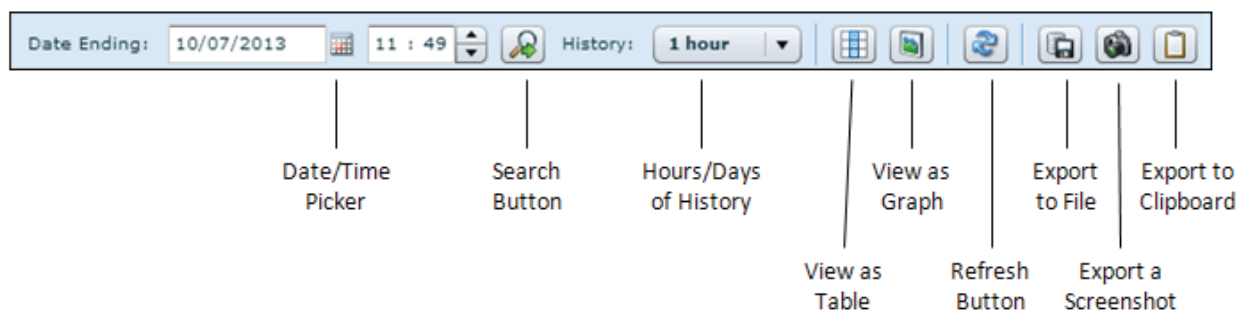
Displaying Data as a Simple Graph

In addition to displaying your data in a table, you can display it in a simple graph. Simply click the  button. To switch back to table display, click the  button. This graph is a simple, basic graph for a quick view. You cannot change scale or channels displayed. For more comprehensive graphing, click the DataSight button in the top right corner of the window.



Navigating the Reports Windows

Use the navigation bar at the top of the window to select the reports you want to view or to export.



If you try to display a large amount of data at one time, the server may time out. This typically happens when you have been taking very frequent recordings and are trying to display a large amount, such as 30-days worth. If this happens, use the Date Ending to set the date for the report and select seven days or less in the History dropdown.

Table 4: Explanation of Navigation Bar Controls on Reports Window

Control	Explanation
Date/Time Picker	To select a specific time window for your data, use the date/time picker to select the ending day and time for your set. Click the Search button. The server will display the records going back from that time/date for the time span shown in the History drop-down.
Search Button	Searches for the records prior to the date/time set in the date/time picker.
Hours/Days of History	Use the History drop-down to select the time span for your data. The smallest time span is one hour; the largest is 30 days.
View as Table	Click the Table View Button to view your data in a table. This is the default view.
View as Graph	Click the Graph View Button to view your data in a graph.
Refresh Button	Click the Refresh Button to immediately refresh the data from the server.
Export to File	Click the Export to File Button to export to a .csv (comma separated values) file. This will export the data in the currently selected date/time range.
Export a Screenshot	Click the Export Screenshot Button to capture a picture of the screen. This will be saved as a .png file to the folder of your choice.
Export to Clipboard	Click the Export to Clipboard Button to export to the clipboard. This will export the data in the currently selected date/time range in .csv (comma separated values) format and can be pasted into other applications or documents.

Domain Management

Introduction

Standard users on myINWdata.com can configure sensors, data collection programs, and call-in schedules, as well as view status information and data reports. For many users, this is everything they need. Some users, however, will need additional functionality, such as adding/editing users or clients and managing modems.

MyINWdata.com is built on a hierarchy of companies, modems, and users. A modem belongs to one company. A user also belongs to one company. Any user belonging to a company can see all modems belonging to that company. You do not assign a user to a modem. If you are selling or renting a modem to another company, you can create a client under your company, create users for that company, and move the modem to that company. This document will explain how to do that.

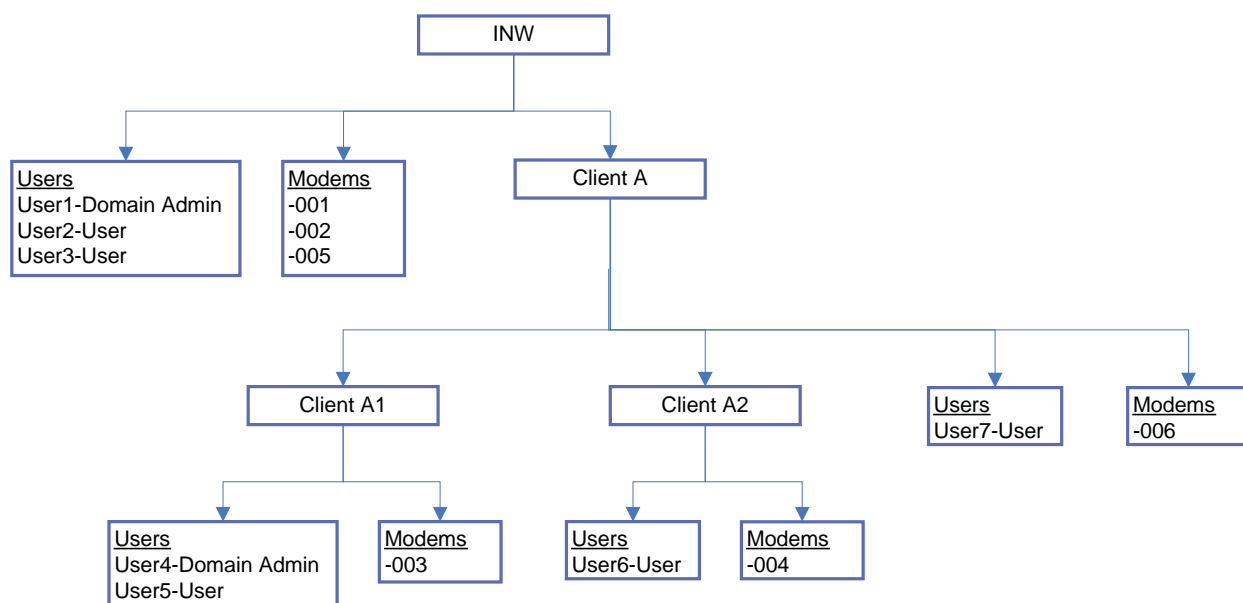


Table 5: Example of Hierarchy

User	Permissions	Can See Modems	Explanation
User1	Domain Admin for INW	-001, -002, -003, -004, -005, -006	As domain admin, can see all modems for INW and for all clients under INW
User2	User for INW	-001, -002, -005	Can only see modems assigned to INW
User3	User for INW	-001, -002, -005	Can only see modems assigned to INW
User4	Domain Admin for Client A1	-003	Can see modems for Client A1 and any subclients, of which there are none.
User5	User for Client A1	-003	Can only see modems assigned to Client A1
User6	User for Client A2	-004	Can only see modems assigned to Client A2
User7	User for Client A	-006	Can only see modems assigned to Client A

Creating a New Client

You must have Domain Administrator permissions in order to create a new client.

- Click on the Accounts Tab, and then select Client List from the list on the left.



- Click the Add button to add a new Client. The Company window will open.

- Enter a name for your new company.
- Be sure your company is listed as the Parent Company.
- If you are allowing this new company to make child companies, check the Allow Child Clients box.
 - You will be asked to enter the maximum allowed tree depth. Enter 1.
 - You will be asked maximum number of clients. Enter 5. (If you need more, contact INW.)

- Checkmark "Enable DataSight Feed."
- Add a comment, if you want.
- Click Save.

Creating a New User

To create a new user, you must have Domain Administrator permissions or the Manage Users add-on permission.

- Click on the Accounts Tab, and then select User Manager.
- If your company has child companies, be sure the correct company is selected in the drop-down box. (If you do not have child companies, this box will not show.)



- Click the Add button to add a new user. The Account Information window will display.

Company Name: **MySubCompany**

First Name: * Sandra

Last Name: * Kelly

Email Address: * sk@email.com

Default Language: **English (United States)**

Login Password: * *****

Confirm Password: * *****

Comments:

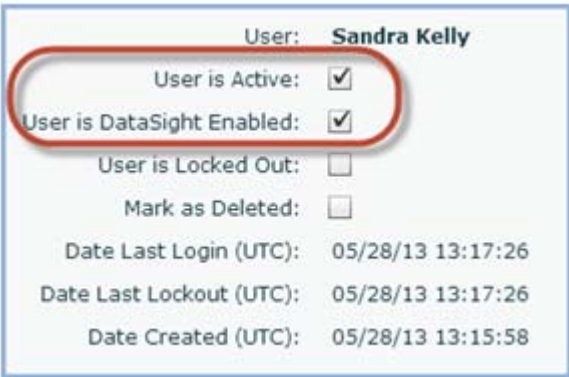
- Select the Company Name (client) from the drop-down box. (If you have recently added the new company and it is not in the list, close the browser and re-login.)
- Enter the requested information. (At this time, English is the only supported language.)
- Click Next.

- The Contact Information window will display.



The screenshot shows a 'Contact Information' window for user 'Sandra Kelly'. It contains fields for 'Primary Email' (sk@email.com), 'Alternate Email' (skelly@abc.com), 'Voice Phone (Primary)' (123-456-7896), and 'Mobile Phone (SMS/Text)' (369-369-2589). Below these is a 'Contact Settings' section with three dropdown menus: 'System Notices' set to 'Ignore', 'Hardware Alerts' set to 'Primary Email', and 'Limit Alarms' set to 'Primary Email'.

- If you are using notifications, fill in the requested information. (See *Alarming and Notifications* section in this manual.)
- Click Next.
- The Status Information window will display.



The screenshot shows a 'Status Information' window for user 'Sandra Kelly'. It features several status checkboxes: 'User is Active' (checked), 'User is DataSight Enabled' (checked), 'User is Locked Out' (unchecked), and 'Mark as Deleted' (unchecked). Below these are three date and time fields: 'Date Last Login (UTC): 05/28/13 13:17:26', 'Date Last Lockout (UTC): 05/28/13 13:17:26', and 'Date Created (UTC): 05/28/13 13:15:58'. A red oval highlights the 'User is Active' and 'User is DataSight Enabled' checkboxes.

- Be sure that “User is Active” and “User is DataSight Enabled” are both checked.
- Click Next.

- The Roles and Permissions window will display.



- Select roles in the left panel. (Note that some roles are basic roles, complete in themselves, while others are add-on roles that can be added to base roles to give further permissions. For instance, you could add “x-Add-on Manage Users” to a User to give them the ability to manage users.)
- Click the Right arrow to move the role to the right panel.
- Click Next.

Table 6: Role Descriptions

Role	Description
Domain Administrator	<ul style="list-style-type: none"> • Full view and edit rights to all users, modems, and clients assigned to their company • View/Edit sensors, call-in schedules, data collection programs • View status and reports
User	<ul style="list-style-type: none"> • View/Edit sensors, call-in schedules, data collection programs • View status and reports
View Only	<ul style="list-style-type: none"> • Same as “User” except can only view — no editing
x-Add-on Manage Modems	<ul style="list-style-type: none"> • Adds ability to edit modems
x-Add-on Manage Users	<ul style="list-style-type: none"> • Adds ability to manage users
x-Add-on Raw Messages	<ul style="list-style-type: none"> • Adds ability to view raw messages — sometimes helpful in trouble-shooting

- The User Summary window will display.

User Name:	Sandra Kelly
Company:	INW Training
Primary Phone:	123-456-7896
Mobile Phone:	369-369-2589
Email/Login:	sk@email.com
Alternate Email:	skelly@abc.com
System Notifications:	ignore
Hardware Notifications:	primary-email
Limit Warnings:	primary-email
Limit Alarms:	primary-email
User Roles:	User
User is Active:	true
User has DataSight:	true
User is Deleted:	false
User is Locked Out:	false
Date Created:	Tue May 28 20:15:58 GMT-0700 2013
Date Last Login:	

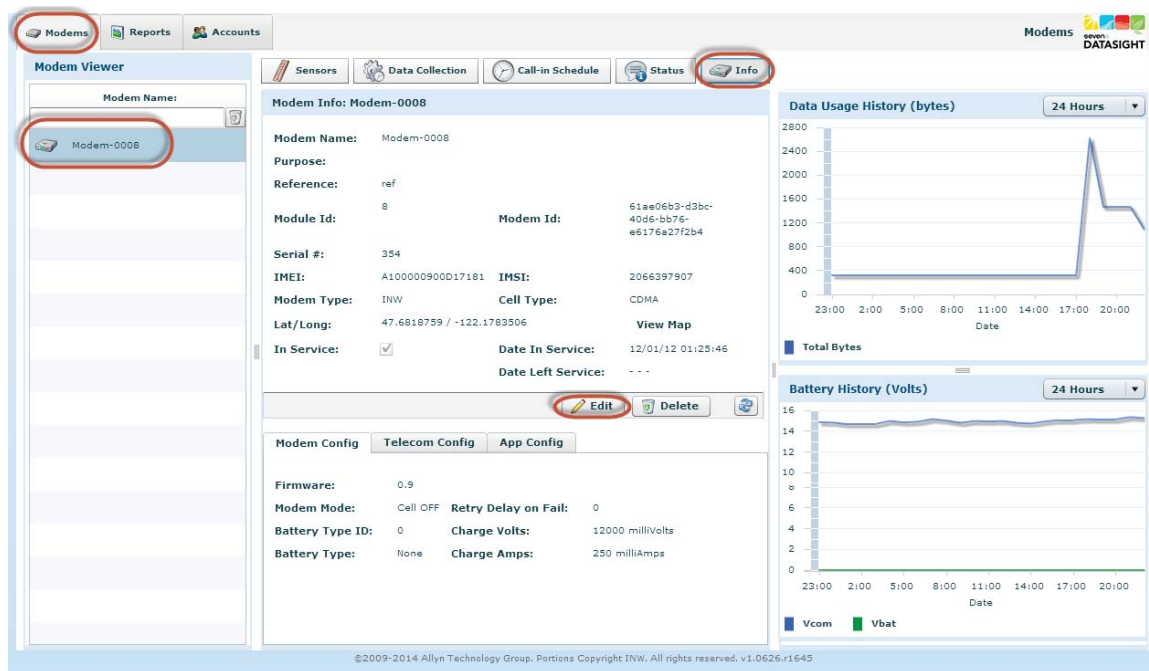
- Double-check your settings. If everything is as you want it, click Save. Otherwise, click Back and make any necessary changes.

This completes setting up a new user.

Editing Modem Information

Edit modem information from the Modem screen. If you are selling or renting a modem to another company, you can create a client under your company and move the modem to that company. You must have Domain Admin or Modem Management permissions to do this.

- Click on the Modem tab, and then click on the Info tab.



- Click Edit in the center of the window, below the Modem information.
- The Modem Information window will display.

Module ID: 000008

Change Owner: ☒ (check to change assignment)

Owner Company: MySubCompany ▼

Modem Name: VZCOM Trainer

Reference:

Serial Number: 123456

Network Provider: Verizon

Network ID (IMEI/MEID): A100000900D17181

IMSI/MTN: 2066397907

Modem Type: Cellara X-CDM

Rechargeable Battery Type: Tenenergy 11.1v Li-on ▼

Idle Mode: Cell OFF ▼

Modem Status: Operational ▼

Show Latitude/Longitude: ☒ (check if Yes)

Latitude: 47.6818759

Longitude: -122.1783506

Icon: Default Icon ▼

Comments:

- If you want to move this modem to another company:
 - Check mark the Change Owner box.
 - Select the new owner from the Company drop-down box.
- You can, if you want, change the name of the modem at this time.
- If you want the modem location to display on the Map tab, check mark the Show Latitude/Longitude box and enter the latitude and longitude in decimal format.
- Click Save when you are done.

Alarming and Notifications

Introduction

One of the powerful aspects of the VZCOM modem is its alarms and notifications feature. Press the test button in the field and get a text or email notification giving the current readings from the modem. Receive automatic text or email notification whenever a reading goes outside limits you have set. You control who will be notified and which types of messages they will receive.

The VZCOM has three types of notifications:

- **System Notices** — sent by the myINWdata.com administrator, typically used to notify users of planned down-time for maintenance or for status notifications during an unplanned down-time.
- **Hardware Alerts** — sent when the Test Button is pressed on the modem. See the *Testing* section earlier in this manual.
- **Limit Alarms** — sent when alarm notifications have been enabled for a sensor and the server detects that one or more readings are outside the set limits. See later in this section for information on enabling alarm notifications on a sensor.



NOTE: The server only examines the readings when a modem calls in to report. For example, if you had an out-of-limit reading at 2:00 AM but your modem only calls in at 8:00 AM and 8:00 PM, you will not be notified until 8:00 AM.

To configure alarming and notifications, you must configure each user that is to receive the notifications and you must configure each sensor where you want to watch for readings outside set limits.

Notifications work on a company wide basis. Within a company, any user that is configured to receive notifications will receive notifications for each sensor that belongs to that company and has notifications enabled. Notifications are sent only to users of the company to which the modem belongs; no messages are sent to users of parent or client companies.

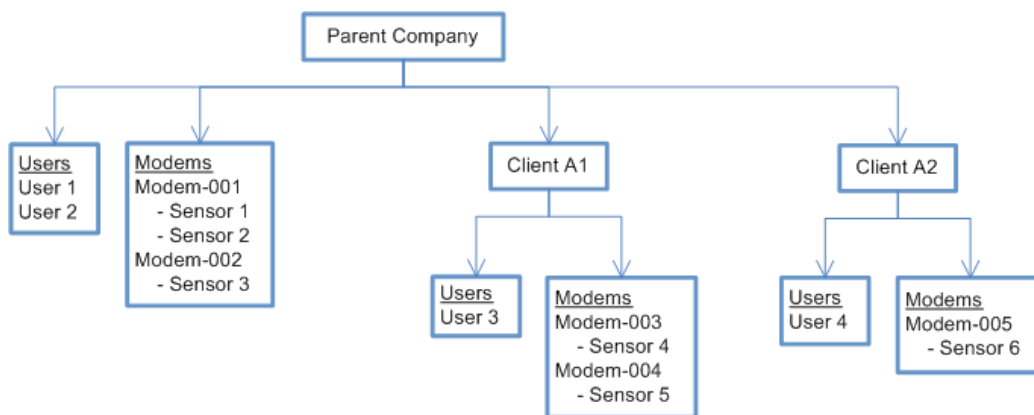


Table 7: Example of Which Users Will Receive Notifications From Which Modems and Sensors

User	Will Receive Notifications
User 1	Modem-001, Modem-002, Sensor 1, Sensor 2, Sensor 3
User 2	Same as User 1
User 3	Modem-003, Modem-004, Sensor 4, Sensor 5
User 4	Modem-005, Sensor 6

User Configuration

You must set up each user you want to receive notifications. If a user is not configured to receive notifications, they will not receive any.

If a person is not yet a user for your company, see *Creating a New User* in the *Domain Management* section of this manual. Once a user is set up, you will need to specify how that user wants to receive notifications.

- Click on the Accounts Tab, and then select User Manager.
- If your company has child companies, be sure your company is selected in the drop-down box. (If your company does not have child companies, this box will not show.)



- Click on the user to edit, and then click the Edit button. Navigate to the Contact Information page by clicking the Next button.

User: **Sandra Kelly**

Primary Email: **sk@email.com**

Alternate Email:

Voice Phone (Primary):

Mobile Phone (SMS/Text):

Contact Settings

System Notices: **Primary Email** ▼

Hardware Alerts: **Alternate Email** ▼

Limit Alarms: **Mobile Phone** ▼

Primary Email ▼

- Ignore
- Primary Email**
- Alternate Email
- Primary Phone
- Mobile Phone

- Enter an Alternate Email, Voice (Primary) Phone, and/or Mobile Phone, as applicable.
- From the Contact Settings drop-down boxes, select the method by which this user will be notified for each of the three notification types.
 - Leave blank or select Ignore for no notification.
 - Select Primary Email or Alternate Email for email notification.
 - Select Mobile Phone for SMS/Text notification.
 - Voice notifications are not available at this time.
- Click the Next button three times, and then click the Save button.



It is often advantageous to use SMS rather than email in the field, especially if you are in remote areas with only 2G coverage where you can't receive emails but text messaging usually works fine.

No further configuration is required for System Notifications and Hardware Alerts. The next section explains how to set limits on sensors from which you want to receive notifications.

Sensor Configuration

In order to receive notifications when readings from your sensor exceed certain limits, you must configure those limits using the Sensor tab.

- Click on the Modems tab.
- Click on your modem in the left panel.
- Click on the Sensors sub-tab.
- Click on the sensor you want to edit, and then click the Edit button.
- Click the Next button twice to take you to the Channel Limits page.



If you are only interested in high warnings and alarms or just in low warnings and alarms, you must put something in the other fields that the sensor will never reach. For example if you have a pressure sensor and you want a high alarm at 60 and high warning at 55, but don't care about the low warnings, you will want to put something such as -20 in both the low warning and the low alarm. If you leave these as zero, and take your sensor out of your well or stream, it may read zero or below and cause an alarm to be generated when not anticipated.

- Set the limits. Limits are set on each channel individually.
 - In the left panel, click on the channel to click.
 - In the right panel, be sure the Enable Limits checkbox is checked.
 - Set the limits as desired. For example, in the sample above:
 - An alarm notification will be sent if the reading is 60 degrees or higher.
 - A warning notification will be sent if the reading is 55 degrees or higher.
 - A warning notification will be sent if the reading is 40 degrees or lower.
 - An alarm notification will be sent if the reading is 35 degrees or lower.
- Click the Update button.
- Once you have set limits for all channels where you want to be notified, click the Next button, and then click the Save button.



If the sensor you just updated is in your Data Collection program, you must reset that program. (See further details under "Adding, Editing, and Deleting Sensors" in the "Operation" section of this manual.)

Sample Notifications

Hardware Notification Samples

A hardware notification is generated when the test button on a modem is pressed. The modem will attempt to take a reading from all sensors that are in its current Data Collection program. It will then send a test message to the user. All time stamps on messages are in UTC (GMT).

If the user has elected to receive hardware notifications via SMS/Text, a text message will be sent with the most recent readings.

Linda -0035 reporting test button readings at 2013-10-07T21:19:39.577:
Temp: 21.313 , Press: -0.025

If the user has elected to receive hardware notifications via email, an email message will be sent with all readings since the last time the modem called in. Any readings that exceed limits will be bold and highlighted in bright pink.

The VZcom modem [Linda -0035] you are monitoring has reported a current status that contains test readings. The information is included in this email:

Reading Date:	Sensor:	Channel:	Value:	UOM:	Upper Alarm:	Upper Warn:	Lower Warn:	Lower Alarm:
2013-10-07 at 21:13:46 GMT	PT2X2	Temp (Temperature)	21.313	degC	21.00000	20.00000	15.00000	10.00000
2013-10-07 at 21:13:46 GMT	PT2X2	Press (Pressure)	-0.025	PSI	24.30000	24.00000	0.10000	0.00000
2013-10-07 at 21:10:03 GMT	PT2X2	Temp (Temperature)	21.313	degC	21.00000	20.00000	15.00000	10.00000
2013-10-07 at 21:10:03 GMT	PT2X2	Press (Pressure)	-0.025	PSI	24.30000	24.00000	0.10000	0.00000
2013-10-07 at 21:05:03 GMT	PT2X2	Temp (Temperature)	21.313	degC	21.00000	20.00000	15.00000	10.00000
2013-10-07 at 21:05:03 GMT	PT2X2	Press (Pressure)	-0.025	PSI	24.30000	24.00000	0.10000	0.00000

Report Information:

Date Rec'd:	2013-10-07 at 21:14:27.470 GMT
Reading Count:	6
Modem Name:	Linda -0035
Modem IMEI:	A100000900D9D2D8
Location:	47.681875900, -122.178350600 (lat/Ing)
Owner:	INWLINDATEST

Limit Notification Samples

When a modem calls in and reports its collected data to the server, the server examines the data, checking for Alarm and Warning conditions. If any are found, a limit notification is generated. All time stamps on messages are in UTC (GMT).

If the user has elected to receive limit notifications via SMS/Text, a text message will be sent listing those readings that were outside the limits set in the sensor(s). There are no differences between Alarm and Warning text messages.

Linda -0035 reporting limit alarms at 2013-10-14T20:10:39.030: Temp: 21.625 , Temp: 21.688 , Temp: 21.625 , Temp: 21.688 , Temp: 21.688

If the user has elected to receive limit notifications via email, an email message will be sent with all readings since the last time the modem called in. Readings that exceed limits will be bold and highlighted in bright pink.

The VZcom modem [Linda -0035] you are monitoring has reported a current status that contains alert conditions. The information is included in this email:

Reading Date:	Sensor:	Channel:	Value:	UOM:	Upper Alarm:	Upper Warn:	Lower Warn:	Lower Alarm:
2013-10-14 at 20:15:03 GMT	PT2X2	Temp (Temperature)	21.688	degC	30.00000	21.00000	15.00000	10.00000
2013-10-14 at 20:15:03 GMT	PT2X2	Press (Pressure)	-0.031	PSI	24.30000	24.00000	0.10000	0.00000
2013-10-14 at 20:14:03 GMT	PT2X2	Temp (Temperature)	21.688	degC	30.00000	21.00000	15.00000	10.00000
2013-10-14 at 20:14:03 GMT	PT2X2	Press (Pressure)	-0.031	PSI	24.30000	24.00000	0.10000	0.00000
2013-10-14 at 20:13:03 GMT	PT2X2	Temp (Temperature)	21.688	degC	30.00000	21.00000	15.00000	10.00000
2013-10-14 at 20:13:03 GMT	PT2X2	Press (Pressure)	-0.031	PSI	24.30000	24.00000	0.10000	0.00000
2013-10-14 at 20:12:03 GMT	PT2X2	Temp (Temperature)	21.688	degC	30.00000	21.00000	15.00000	10.00000
2013-10-14 at 20:12:03 GMT	PT2X2	Press (Pressure)	-0.030	PSI	24.30000	24.00000	0.10000	0.00000
2013-10-14 at 20:11:03 GMT	PT2X2	Temp (Temperature)	21.688	degC	30.00000	21.00000	15.00000	10.00000
2013-10-14 at 20:11:03 GMT	PT2X2	Press (Pressure)	-0.030	PSI	24.30000	24.00000	0.10000	0.00000

Report Information:

Date Rec'd: 2013-10-14 at 20:15:40.437 GMT
 Reading Count: 10
 Modem Name: Linda -0035
 Modem IMEI: A100000900D9D2D8
 Location: [47.681875900, -122.178350600](#) (lat/lng)
 Owner: INWLINDATEST

Frequently Asked Questions (FAQ)

Installation**Why is grounding important?**

Grounding does two things. First it protects equipment and personnel from high power spikes. Without a proper grounding system, a power spike will find the path of least resistance to earth ground, whether that path is through sensitive electronic equipment or the person operating that equipment.

Second, it improves measurement accuracy by eliminating ground loops. When using several pieces of interconnected equipment, each of which may have its own ground, problems with noise, signal interference, and erroneous readings may be noted.

See the *Installation* section in this manual for detailed grounding instructions.

How do I connect more than one sensor to a VZCOM modem?

To connect more than one sensor you will need either a T-Adapter or a junction box. Both are available from INW. Contact your sales representative for details.

Since I am using my VZCOM with myINWdata.com, why do I need Aqua4Plus?

Before connecting to the VZCOM, Aquistar Smart Sensors must be configured for their Sensor Modbus address and reporting units, if other than default units. This is done using Aqua4Plus. See details in the *Installation* section of this manual.

Diagnostic Lights**What is the blinking light seen through the lens on top of the VZCOM?**

The VZCOM is equipped with diagnostic lights to help in trouble-shooting. These lights can be seen through the lens on top of the unit.

Table 8: Explanation of Diagnostic Lights

Light Pattern	Meaning
No lights	No power or not operating
Green light on steady for at least 4 seconds	Modem just powered up
Green light blinking every 8 seconds	Power on, modem idle
Green light blinking rapidly	Communicating with cellular network
Orange light blinking	Communicating with sensors

Test Button**What is the purpose of the test button?**

The test button on the VZCOM is designed to provide the VZCOM installer with information critical to deciding whether it is okay to leave the site. This button will provide a technician with most of the information to decide whether the installation has been a success or not.

If you press the test button on the top of the VZCOM, the following will happen:

- A reading will be taken from all sensors currently in the modem's program.
- The network will be contacted, the data just collected uploaded, and any new configurations downloaded to the modem. If so configured, the server will also send an email or text message with this information.

Why is the test button not responding?

Watch the diagnostic light on the top of the modem when you press the test button. You should see the orange light blinking shortly after pressing the button. This indicates that the modem is attempting to read the sensors. If you do not see this light:

- Check the myINWdata.com server to be sure you have a data collection program active.
- Contact INW, as there may be a wiring issue with your modem.

Is the status being updated on myINWdata.com?

- If you have access to myINWdata.com, check the Status Tab. You should see a new status line appear within a couple minutes after pressing the test button.
- If you do not see a new status line, the modem is not successfully calling in to the server. See more details below under *Calling in to the Server*.

Are you set up to receive SMS/Text or email messages?

- In order to receive messages from a test button activation, you must be a user assigned to the same company as the modem and you must have set your Contact Settings for Hardware Alerts to either one of your email addresses or your mobile phone. See *Configuring Users* in the *Installation* section of this manual.
- If you are set up to receive email messages but are in a fringe reception area, try setting to receive SMS/Text messages, instead. In some areas text messages get through even when emails may not.

I updated my data collection program on the server and then pressed the test button. Why are the readings in my message those from a previous program?

When you press the test button, the modem reads any sensors in its current program, uploads that data, and then picks up any new program from the server. In order to get readings that reflect the new program, you must press the test button again.

See also the *Testing* section earlier in the document for details on using the test button.

Calling in to the Server

How do I know if my modem has been calling in to the server?

Check the Status Tab on myINWdata.com. There will be a status line with a date/time stamp for each time the modem has called in to the server.



Why is my modem not calling in to the server?

There can be several reasons why a modem is not connecting to the server.

- You may not have a call in schedule properly configured. Check the Call-in Schedule Tab on myINWdata.com.
- You may be in an area of poor reception. If the modem has previously been calling in but has now stopped, check the CSQ (signal strength) column on the Status Tab on myINWdata.com. If you see messages with only one bar, you may be on a fringe area. If you are in a fringe area:
 - Mount the modem higher to get better reception.
 - Consider getting a higher gain antenna. Your INW sales representative can help you select one.
 - If you have a high gain directional antenna, be sure it is properly oriented towards the cell tower.
- Your battery may be dead. See the *Internal Battery* section below.

During the week I want my modem to call in every few hours, but on the weekend to only call in once a day. How do I schedule the modem to do this?

Use the Call-in Schedule tab to schedule various different call in times and frequencies. See Adding and Editing Call-in Schedules in the Operation section of this manual.


Schedule Actions:			
			
Action Type:	Days Run:	Time/Freq:	Event Type:
Report	-MTWT--	Every 6 hours at 0 mins past the hour	Repeats
Report	S-----S	Occurs at 08:00 AM (GMT-8)	Single

Reading Sensors

My modem is calling in to the server, so why am I not getting any data?

- On the Call-in Schedule tab be sure you have selected “Report” and not “Check-in” for the action type.
- Be sure the address assigned to your sensor on the Sensors tab is the same as the address actually on the sensor.
- Be sure you do not have more than one sensor on the same address.
- Be sure you have a data collection program defined on the Data Collection tab.
- In the lower panel on the Data Collection tab, be sure it does not say N/A in the Device column. If it does, this means that the sensor configuration has changed since the data collection program was created and you need to reset the program. See Warning in Adding, Editing, and Deleting Sensors in the Operation section of this manual.

Add New Action...



☐ Check-In
 ☒ Report
 ☐ Cell Standby
 ☐ Cell Off

Program Actions for Tag #: 2	
Action Type:	Device:
Record Data	N/A

- Be sure the sensor(s) whose data you want to record are shown in the lower panel on the Data Collection tab. If the column is blank or says only “Modem,” you will need to modify the program to include your sensor(s). When defining your data collection program, select the sensor for an activity from the second drop-down box, labeled “On Sensor.”
- Check the cable connections to be sure there are no loose cables or wires.
- Remove the sensor from the modem and connect to a computer running Aqua4Plus to be sure that you can read the sensor. (Note: if you are using PT12’s, they cannot be read by Aqua4Plus. Contact INW.) If you cannot read the sensor and it has internal batteries, replace the batteries with fresh batteries. See your particular sensor manual for details on changing batteries. If you still cannot read the sensor, contact your INW representative for further help.

Desired Action:

On Sensor:

Action Days:

Action Time:


Reporting Data

The data is displaying with the newest data at the top. Can I display the data with the oldest data at the top?



Yes. If you click on the “Reading Date” column header, the display order will reverse.

Can I export my data to Excel or other programs?


It is very easy to export your data in a comma separated values format (.csv). This format is easily read by

Excel and a host of other programs. Export your data by clicking on the export  button on the right side of the navigation bar on the Reports tab. This exports the data in the currently selected date/time range.

How do I see my data as a graph?

Switch between viewing your data in a table and as a graph by clicking the table  and graph  buttons on the navigation bar. For more powerful graphing options, click the DataSight button at the top right of the window.

Can I see my data from a couple months ago? The History drop-down box only allows for up to 30 days.

Yes. First select how much data you want to view, up to 30 days worth. Next select the ending date and time for the data you want to view. Finally, click the search  button on the navigation bar. For more details, see *Understanding Reports* in the *Operation* section of this manual.

Why is my data displaying on a separate report line for each sensor I am reading, even though they were to be read at the same time?

If you are displaying more than one sensor, the data for each sensor will appear on a separate line with its own date/time stamp. When taking readings from several sensors, the modem will read each sensor in turn. It may take a few seconds to read a particular sensor, so the time stamp may be slightly different for each sensor.

Why do my data values appear in the wrong units? The header column says Degree F, but the values appear to be in Celsius.

The units for the actual values must be set on the sensor using Aqua4Plus from the Configure Menu, Advanced | Direct Read Units. You must then select the SAME units when setting up your sensor in myINWdata.com. The units selected in myINWdata.com are for column labeling purposes only and must be the same as those actually set on the sensor. For further details, see *Set Reporting Units* under *Configuring Sensors with Aqua4Plus* in the *Installation* section of this manual. (If you are using a PT12, contact INW for information on units.)

Why did a new column start in the report for the same sensor?

Whenever you make a change to a sensor, the data for that sensor will be reported in new columns thereafter. When you change a sensor, the modem and server have no way of telling if this is a different sensor or not. In order to correctly process the data it receives from the modem, the server treats the changed sensor as a new sensor, thus the new columns in the report.

Why is some data being reported more than once?

This can occasionally happen if the modem successfully uploads its data to the server but does not get an acknowledgement from the server. To prevent loss of data, the modem keeps the data and tries again later, only deleting the data from the modem once the server has acknowledged that it has received it.

Internal Battery**How do I tell if my battery is charging?**

On the Status Tab there are two columns relating to battery power, VBat and VCom.

- If VBat and VCom show about the same voltage, it is not charging. Note that on a cloudy, dark day, the charger may not be charging due to lack of sunlight.
- If VCom is significantly higher than VBat (typically at least two to three volts higher), it is charging.
- If VCom toggles between being similar to VBat and being higher, it is trickle charging.

What voltage is normal on the internal battery?

For a fully charged battery, VBat will read between 11 and 13 VDC.

What if my battery does not appear to be charging?

- The battery power switch on the bottom of the modem must be set to “ON” in order for the internal battery to charge.
- Check your power cable connections.
- If you are charging your battery with a solar panel be sure the solar panel is located so as to receive an adequate amount of sunshine. On dark, cloudy days, the solar panel may not supply enough voltage to charge the battery. If this is the case, contact your INW representative for alternatives.
- If you are charging your battery with an external battery pack, be sure that pack has not gone dead.

I am running my modem on just the internal battery. Why did it die after a few days?

Many factors affect how long the internal battery will run, including how often it is collecting data, how often it is calling the server, how much power the connected sensors use, if powered by the modem, and how high a charge the battery had when deployed.

For longest battery life, if you will be deploying your modem without a solar panel or other charging device in the field, be sure to fully charge the battery before deploying. Connect the 110V power adapter cable to the power connection on the modem. (See diagram in the *Mounting* section in this manual.) Plug the adapter into a wall outlet and let charge overnight. **IMPORTANT:** the battery power switch on the bottom of the modem must be set to “ON” in order for the internal battery to charge.

Check the Info tab, under the Modem tab and see if the “Retry Delay on Fail” is set to zero. If not, you may want to contact INW to reset this for battery conservation.

I need to ship or transport my modem via airplane. Is there anything special I need to do?

You must be sure the internal battery is turned off. Do this by setting the power switch on the bottom of the modem to the “OFF” position.

Can I replace the internal battery?

No. There are no user-serviceable parts inside the modem case. If you need a new battery, contact INW.

Limits, Alarms, and Notifications

The Alarming and Notifications section in this manual has in-depth information on configuring alarms for further information.

Why am I not receiving alarm messages from my modems?

- Be sure your user profile is configured to receive Limit Alarms.
- Be sure limits have been correctly set on your sensor(s).
- If any of your modems have been assigned to a client under your company, you must have a user account under that client in order to receive alarm messages from any modems assigned to that client. For more details, see the *Domain Management* section of this manual.

I am only interested in “High” warnings and alarms, no “Low” warnings and alarms. How do I set this?

If you are only interested in High levels, be sure to set the Low warning and alarm levels to something lower than your sensor will ever read. Likewise, if you are only interested in Low levels, but sure to set the High levels to something higher than your sensor will ever read.

A limit was exceeded at 2:00 AM. Why was I not notified until 8:00 AM?

The server only examines the readings when a modem calls in to report. For example, if you had an out-of-limit reading at 2:00 AM but your modem only calls in at 8:00 AM and 8:00 PM, you will not be notified until 8:00 AM.

Miscellaneous

Why is my modem not showing on View Map?

The the View Map button on the Modem Info tab is designed to show a map of the area surrounding your modem, which is marked with a pin. In order for the map to know a location for your modem, you must have the latitude and longitude entered into the modem information fields. See *Editing Modem Information* in the *Domain Management* section of this manual. You must have Domain Admin or Modem Management permissions to change modem information.

Is there a way to see modems assigned to a client under my company? I need access in order to support my client.

Yes, there are two ways to do this.

- If you have Domain Admin permissions for your company, you will be able to see and manage all modems under any of your company’s clients. See the *Domain Management* section in this manual.
- You can create a new user for yourself under the client company.

I am not a Domain Admin but I need to manage users under my company?

Your Domain Admin can give you an add-on permission to manage users under your company. See the *Domain Management* section in this manual.

Can I give access to my modem to someone else?

Any user with Domain Admin or Manage Users permissions can add new users.

What do the flags mean on the Status tab?

Most common flags are:

- P - There was a power cycle.
- B - Low battery. If the battery is low, the line will also be highlighted in pink.
- R - A Report is ready to upload and will upload momentarily.
- A - The modem has an active data collection program.
- C - Modem is checking in. If there have been changes to that modems configuration on the server, it will be downloaded at this time.

Can I access my modem from an iPad?

Not at this time. The server interface requires a browser that is Flash enabled and iOS does not support Flash.

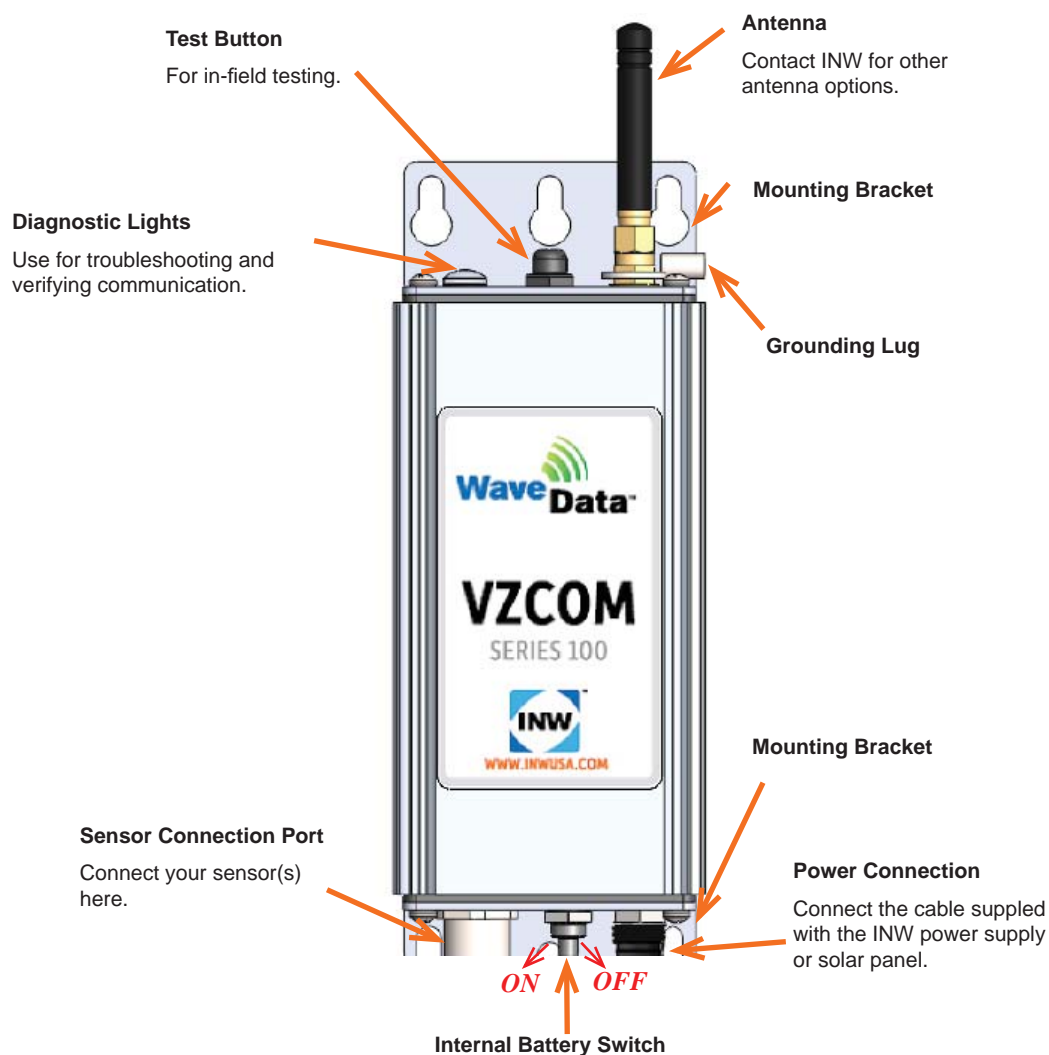
What is DataSight?

DataSight is a powerful graphing, reporting, and data management system. An introductory level of DataSight is available to all VZCOM users. Simply click on the DataSight logo near the top of the screen. For further information and options, contact your INW representative.

Technical Specifications

GENERAL

Housing	Aluminum
Dimensions	4.86"L x 1.2"H x 2.5"W (12.3cm L x 3.0cm H x 6.6cm W)
Weight	0.5 lbs. (0.23kg)
Communication	Modbus/RS485
Operating Temperature	-20° C to 50° C
Storage Temperature	-40° C to 80° C
Certifications, Approvals, Compliance	RoHs, FCC, IC, CDMA Carrier Approval
Cellular Network	Verizon
Diagnostics	Two colored LEDs for troubleshooting



DATA COLLECTION

Logging	Logs internal temperature, Voltage, RSSI, and up to four INW sensors
Output Voltage	12 VDC switched for power sensors (500 mA)
Maximum Total Sensor Cable Length	2000 feet (600 meters)

RF SENSITIVITY

Sensitivity	
1900 MHz (CDMA)	-108dBm
800 MHz (CDMA)	-108dBm
Signal Strength	
> -65 dBm	5 bars
-74 to -65 dBm	4 bars
-84 to -75 dBm	3 bars
-94 to -85 dBm	2 bars
-104 to -95 dBm	1 bar
< -104 dBm	0 bars

POWER OPTIONS

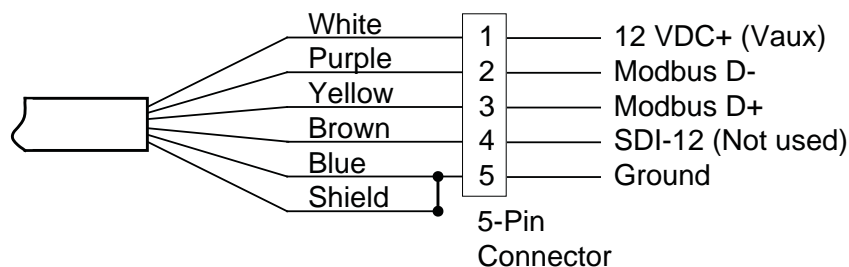
Internal, Rechargeable (Included)	11.1 Volt Lithium Ion Battery Pack
Wall (Included)	110 Volt AC 18 VDC - 10 A/HR (18 Watts)
Solar Option	1.4 A/HR Sealed Lead Acid 10 Watt Panel with 10' Cord
High Capacity Option	Lithium AA 16.8 VDC - 1-Year Life ² 2.6 A/HR Lithium D ¹ 16.8 VDC - 5-Year Life ² 14 A/HR

¹ Class 9 Hazardous Material - Ground shipping ONLY without certification

² Based on 15 minute data collection with four call-ins per day

WIRING

Sensor cable to weather-resistant 5-pin connector



Sales and Service

INW Headquarters

8902 122nd Ave NE
Kirkland, WA 98033

Phone: (800) 776-9355 or (425) 822-4434

Fax: (425) 822-8384

Sales: sales@inwusa.com

Support & Repairs: support@inwusa.com

Business Hours: 7:30 AM to 5:30 PM Pacific Time

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INW
8902 122nd Avenue NE
Kirkland, WA 98033 USA
425-822-4434
FAX 425-822-8384 / info@inwusa.com

