



AquiStar[®]

AQUA4PUSH

Data Collection and Upload Utility



True data, measure by measure

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Introduction

What is Aqua4Push?

Aqua4Push is INW's data collection and upload program. It is designed to run continuously and collect data at user-selectable intervals from a network of INW Smart Sensors. Optionally, Aqua4Push sends a data file to an FTP site after each collection. The collected data is then available via the Internet from anywhere in the world.

When running, Aqua4Push:

- “Wakes up” at the specified interval
- Optionally, turns on any needed relays
- Takes readings from all sensors
- Turns off relays
- For pressure sensors, optionally makes adjustments based on barometric pressure
- Appends to a monthly data file
- Optionally, uploads the data to an FTP site

For test purposes, the program can be set into a test mode where it will take readings every five minutes. Also, you can force a single reading/upload at any time.

You can use Aqua4Plus (INW's Smart Sensor Control Program) while Aqua4Push is running. If you are running a program, such as Aqua4Plus, that uses the same COM port, and it gets close to time for the next reading, a message will pop up warning that a reading is soon scheduled. If you continue to run the other program, the reading will simply be skipped.

An error log is maintained on the local machine. Errors are logged whenever a sensor cannot be read and whenever an upload is unsuccessful.

System Requirements

- Desktop or laptop computer, running Windows 98 or higher.
- 128 MB RAM
- 20 MB free hard drive space
- CDROM drive
- 9-pin serial port or USB port
- Optional modem or Internet connection. (Note: If you are using an IP modem, you will also need the COM redirection program. Contact INW for details.)

Getting Started

Quick Overview

The following steps are needed to install and configure an Aqua4Push sensor network. Each step is explained in detail in the following sections.

- Install Aqua4Push and Aqua4Plus
- Set Sensors and Radios with Aqua4Plus
- Connect Sensors and Radios
- Create or Edit Sensor Map
- Set Polling Schedule
- Select Sensor Map
- Initialize Network

Installing Aqua4Push and Aqua4Plus

Installing Aqua4Push

1. Insert the Aqua4Push CD in the CDROM drive on your PC or laptop. Installation should start automatically. If not, then follow steps 2 and 3. Otherwise, skip to step 4.
2. Click the Start button and select Run.
3. Type D:\setup.exe, where D: is the drive letter for your CDROM drive.
4. The Installation program will guide you through the installation process.

Once the software has successfully completed installation, you can remove the CD from your CDROM drive and store it in a safe place.


Installing Aqua4Plus

Aqua4Plus is INW's Smart Sensor Control Software. Use it for initial set up of your network and for background data recording.

1. Insert the Aqua4Plus CD in the CDROM drive on your PC or laptop. Installation should start automatically. If not, then follow steps 2 and 3. Otherwise, skip to step 4.
2. Click the Start button and select Run.
3. Type D:\setup.exe, where D: is the drive letter for your CDROM drive.
4. The Installation program will guide you through the installation process.

Once the software has successfully completed installation, you can remove the CD from your CDROM drive and store it in a safe place.

Setting the Sensors and Radios with Aqua4Plus

Use INW **Aqua4Plus** Control Software to view the individual sensors and radios that will be in your network. To start Aqua4Plus, use the Start Menu to navigate to the program group you selected during installation (typically this will be Aqua4Plus), and then click the Aqua4Plus  icon.

If needed, use Aqua4Plus to set addresses on each sensor. **Every sensor and radio on your network must have a unique address.** Note that host radios are always address 1. You can also, at this point, set any sensor or channel labels descriptions, if desired. (See the *Aqua4Plus Control Software Instruction Manual* and specific hardware manuals for setup details for each type of sensor and radio.)

IMPORTANT!

If INW supplied a pre-configured Sensor Map, the addresses and descriptions on your sensors and radios should match those in the Sensor Map. (See page 6 for details in viewing and/or changing the Sensor Map, if needed.)

Connecting Sensors and Radios

Aqua4Push collects data from a number of INW Smart Sensors, including:

- PT2X Pressure/Temperature Sensor
- PT2X-BV Barometric Sensor
- TempHion pH/ISE/Redox Sensor
- CT2X Conductivity/Temperature Sensor
- T16 Smart Temperature Sensor.
- GDL Smart Datalogger

For specific installation details on each sensor type, refer to their corresponding manuals. Networks of sensors can be connected in one of several ways. (See Appendix A for sample network wiring diagrams.)

- Directly to a PC
- Via a dial out modem on the PC to a cellular modem at the sensor site
- Via an Internet connection to a cellular IP modem at the sensor site
- Via a WaveData Collection network.

Creating and Editing Sensor Maps

Overview


Aqua4Push is designed to work with specific sensor addresses and descriptions. This information is stored in a file called a Sensor Map. This file controls such things as what sensor addresses are polled, the types and names of sensors found on each of those addresses, which COM port to use, and various other parameters. It also controls the polling interval.

Sensor Maps are created and maintained using the Sensor Map Editing utility. You can have several different Sensor Maps, each with a different name, and you can switch between them, if you want to use your computer at different sites, or if you have several different configurations you want to use at one site. The files must have an extension of .inf and can be saved anywhere on your hard drive.

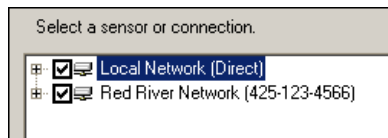
Creating and Editing Sensor Maps

A word about “Connections” is in order at this point. Aqua4Push is designed to be able to poll not only sensors connected directly to your computer, but also sensor networks connected via cell modems or radios. The Sensor Map utility has an expanding tree window that lists each Connection, and under each Connection, it lists each sensor that is connected in that network. For example, you might have one network of sensors directly connected to your computer via a COM port and another network of sensors connected via a cell modem. The following section will describe how to create and edit a Sensor Map.

To create or edit a Sensor Map, start Aqua4Push -- use the Start Menu to navigate to the program group you selected during installation (typically this will be Aqua4Push),

and then select the Aqua4Push  icon. If you get a message about not finding a valid Sensor Map file or about the network not being initialized, simply close the message. Open the File menu, and then select either New Sensor Map (to create a Sensor Map) or Edit Sensor Map (to edit an existing Sensor Map). The letters in the following descriptions refer to figures 1 through 4.

Upon opening the Sensor Map utility, a list of connections will display on the left hand side of the panel, as shown below. (If you are creating a new file, this panel will be blank.)



Click on the + in front of each connection to expand the tree (C). The tree will then

display the connections (D) and the sensors (E) that are under each connection.

Adding/Editing/Deleting Connections

To create a new connection, click the Add Connection button (F). If you want to edit an existing connection click on that connection on the connection tree in the left panel.

Enter or edit the information in the right hand panel, as follows:

- (I) Select the connection type.

For sensors that connect directly to your COM port or for a network whose base station radio is directly connected to your COM port, select **Direct**. For sensors that connect via a dial up modem, select **Modem**. For sensors that are connected via an IP modem, select **IP Modem**.

- (J) Enter a name for your connection. This should be something that will help you identify the location.

- (K) If you selected a connection type of Modem, enter the telephone number for the modem you are calling, including a 1 and the area code, if needed. If you need to dial a 9 or another access code, enter that at the beginning, followed by two or three commas. (Commas provide a slight pause before the next digit.)

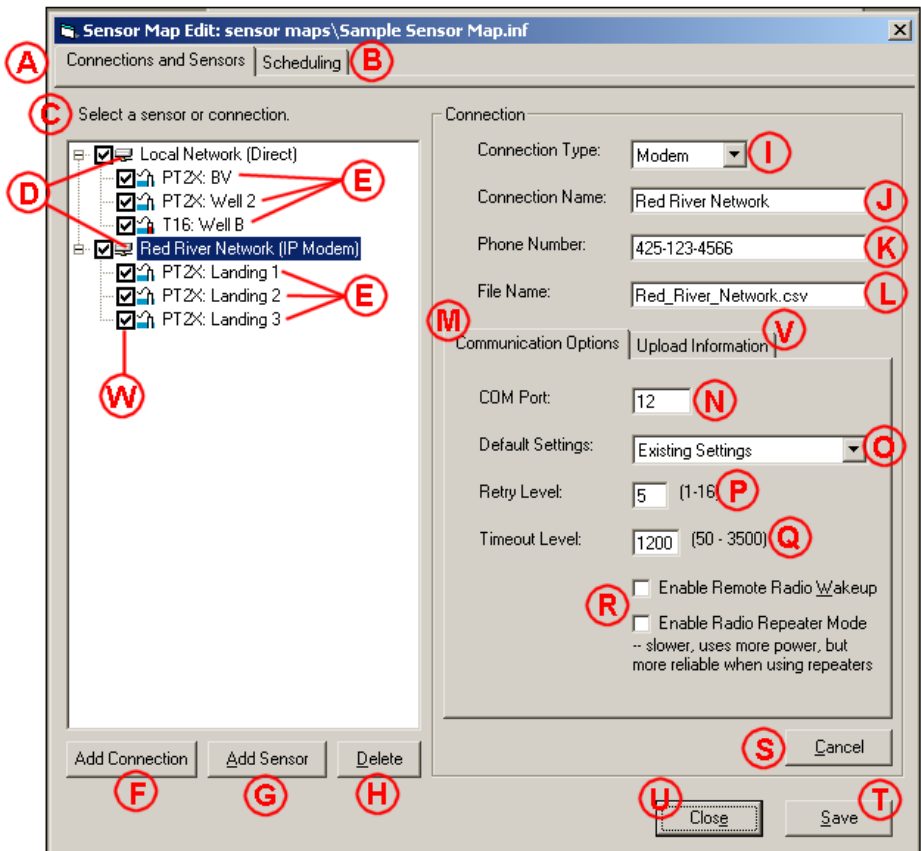
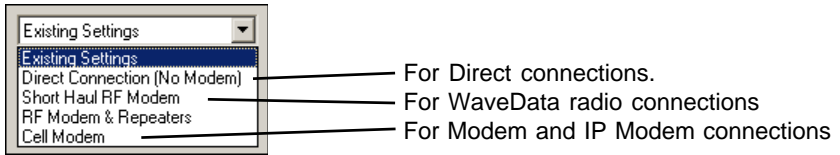


Figure 1: Sensor Map Utility - Connections Panel

For example: 9,,1 206 333 3333.

- (L) Enter the name you want for the data file for this connection. Each connection will have its own data file. If you leave this blank, a file name based on the connection name will automatically be generated.
- (N) If you have a direct connection, enter the COM port that your sensors are connected to. If you are using a dial out modem, enter the COM port for your modem. If you are using an IP modem, enter the COM port that has been assigned to that modem using a COM redirection program. (Contact INW for details on a recommended COM redirection program.)
- (O) Default Settings: From the dropdown box, select communication settings for this type of connection. This will set the timeout and retry values that are recommended for particular types of settings.



- (P) The retry level is how many times the program will retry a particular command before giving up and treating it as an error. This value is automatically set when you select a Default Setting. It can be changed here, if needed.
- (Q) The timeout level is how long the program waits for a response from a sensor before trying again or giving up as an error. This value is automatically set when you select a Default Setting. It can be changed here, if needed.
- (R) If you are using WaveData radios anywhere in your network, check the Enable Remote Radio Wakeup box. This will send out a special command to wake up any radios that are in power saving sleep mode before attempting to communicate with the sensors. Do not use the Radio Repeater Mode, unless instructed to do so by INW.
- (V) If you will be uploading your data to an FTP site, click on the Upload Information tab to display the Upload Information panel. Enter the requested information. Click on the Communication Options tab (M) to return to the main connections panel.

Communication Options	Upload Information
FTP Address:	<input type="text" value="inwusa.com"/>
User Name:	<input type="text" value="inw_demo"/>
Password:	<input type="password" value="XXXXXXXX"/>
Reenter Password:	<input type="password" value="XXXXXXXX"/>

Figure 2: Upload Information Panel

- (S) Click the Cancel button if you want to cancel adding or changing this connection.
- (T) If you are done with the changes for this connection, click the Save button.
- (H) To delete a connection, click on the connection in the left panel and then click the Delete button.
- (W) If you want to temporarily stop taking readings from a particular connection or sensor, uncheck the checkbox in front of that connection or sensor. To begin taking readings from that connection or sensor again, simple re-check the box.
- (U) When you are done making changes to the Sensor Map, click the Close button.

Adding/Editing/Deleting Sensors

To add a new sensor to an existing connection, click on that connection, and then click the Add Sensor button (G). If you want to edit an existing sensor, click on that sensor on the tree in the left panel. Enter or edit the information in the right hand panel, as follows:

- (V1) From the Type dropdown box, select the sensor type.
- (V2) Enter a name for your sensor. This should be something that will help you

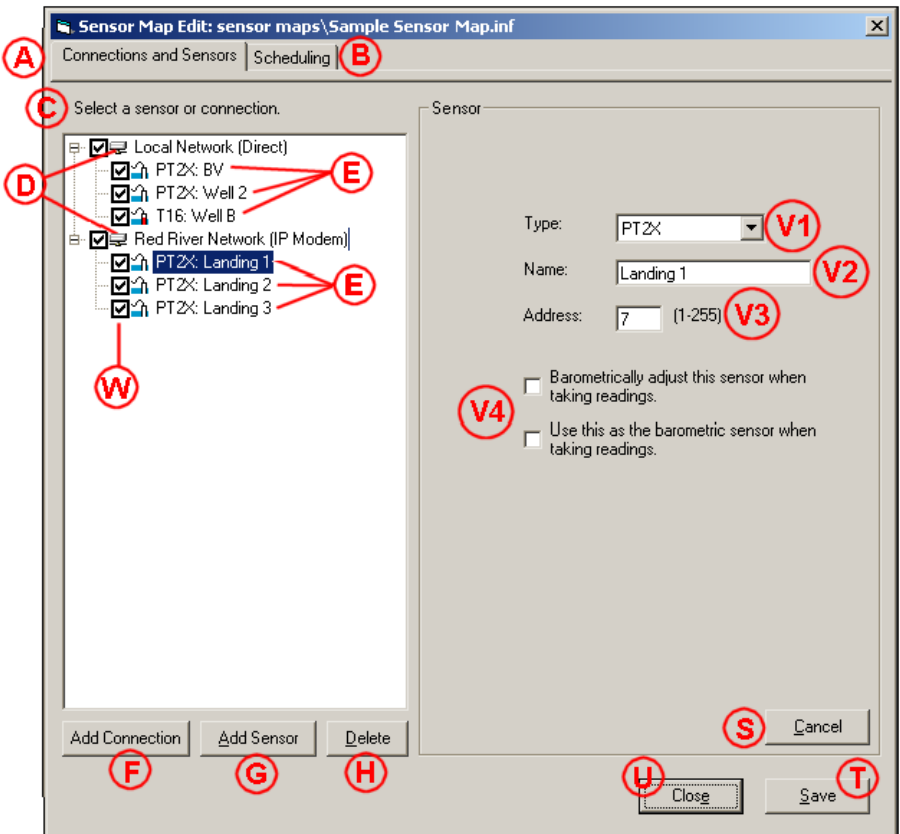


Figure 3: Sensor Map Utility - Sensor Panel

identify the sensor. Ideally, this should be the same name that is assigned to the sensor in Aqua4Plus.

- (V3) Enter the sensor address. (If you are unsure of the sensor address, use Aqua4Plus to scan for the sensor. Move the mouse over the sensor on Aqua4Plus's sensor tree. The sensor address will show in a popup tool tip.)
- (V4) If you have a PT2X-BV (barometric sensor) in your network, Aqua4Push can automatically apply barometric compensation to any PT2X measurements. To specify that the selected sensor is the barometric sensor to be used in these calculations, checkmark the second box. To specify that this sensor's readings are to be barometrically compensated, checkmark the first box. (Note, you must have a barometric sensor higher in the tree than the first sensor you want compensated.) If you are not using barometric compensation, leave both these boxes unchecked.
- (S) Click the Cancel button if you want to cancel adding or changing this sensor.
- (T) If you are done with the changes for this sensor, click the Save button.
- (H) To delete a sensor, click on the sensor in the left panel and then click the Delete button.
- (U) When you are done making changes to the Sensor Map, click the Close button.

Setting Polling Schedule

The Sensor Map is also used to control the polling schedule. If the Sensor Map is not open, select Edit Sensor Map from the File menu. Click on the Scheduling tab (B). When running, Aqua4Plus will take readings from all sensors on all connections at each polling time. You cannot have different schedules for different sensors or connections. You can have different schedules in different Sensor Maps. Set the polling information as follows:

- (B1) Select the base polling frequency. In other words, will you be taking readings every few seconds, every few minutes, daily, monthly, etc.
- (B2) From the Start Time dropboxes, select the time the polling is to start in hours, minutes, and seconds. Note: use 24 hour time.
- (B3) Refine your polling interval. For instance, if your base polling frequency is in minutes, enter the number minutes from the start of one reading to the start of the next. (Note: some readings may take several seconds, depending on how many sensors you are polling, and whether you are using radios. If you are using a number of cell modems and have a number of connections, it may take several minutes to complete a reading. If the polling interval is set lower than the amount of time it takes to make a reading, the readings will simply be taken one right after the other.)
- (T) When you have set the polling interval, click the Save button.
- (A) Click the Connections and Sensors tab, if you want to return to the main Sensor Map panel.
- (U) If you are done making changes to the Sensor Map, click the Close button.

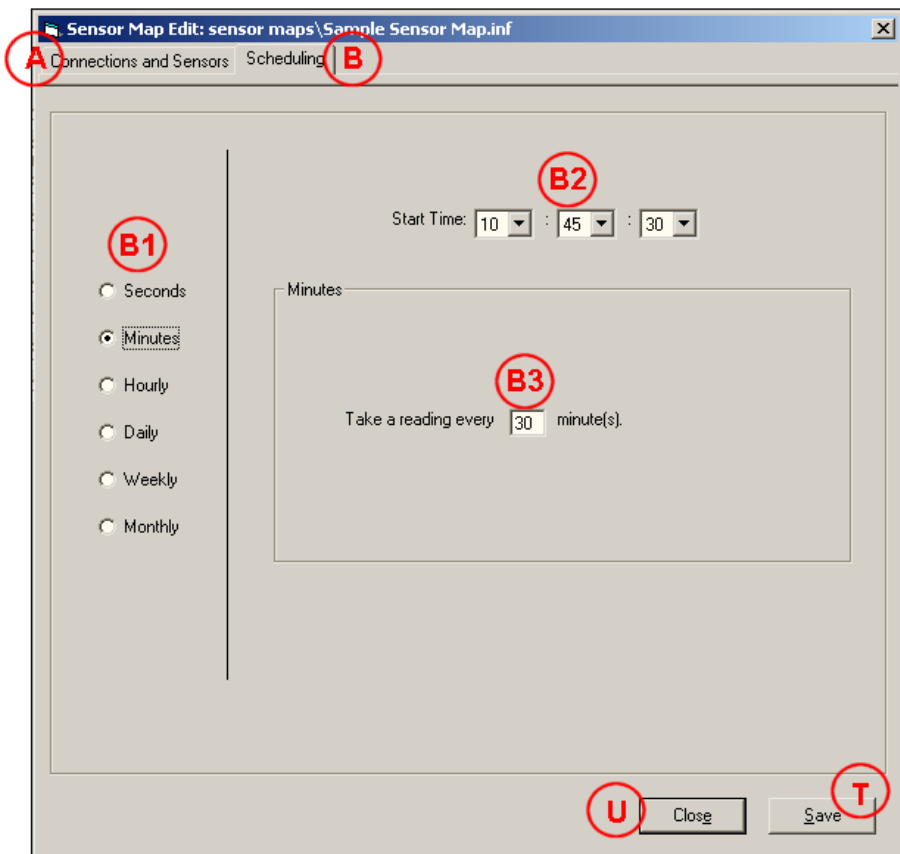


Figure 4: Sensor Map Utility - Sensor Panel

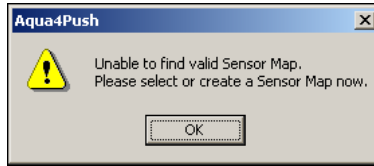
Selecting the Sensor Map

To select an existing Sensor Map, open the File menu, and then click on Select Sensor Map.

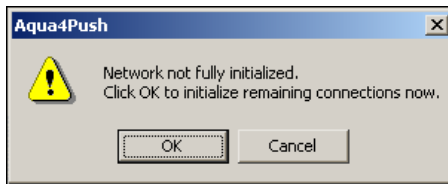
Initializing the Network

Before Aqua4Push can actually begin to take readings, it must initialize the network. During network initialization, the program connects to and reads each sensor that is listed in your Sensor Map file. It reads certain setting and calibration information from the sensors that it will need to use during readings. It combines this information with various other information from your Sensor Map file, including the polling schedule, to set up an internal control file that will control when and how to take readings.

The very first time you run Aqua4Push, you may get the following message:



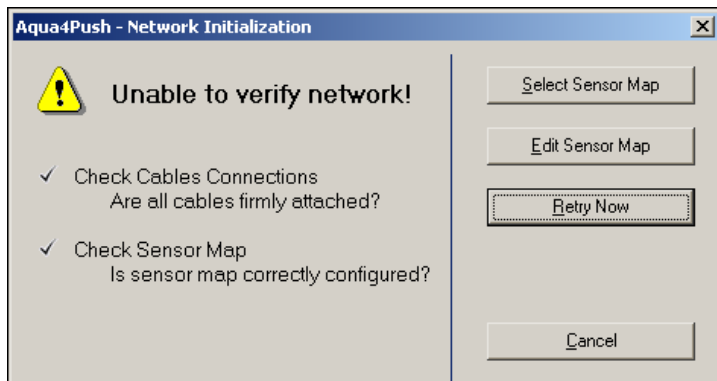
This means that no Sensor Map has yet been selected. Close this message box. From the File Menu, click on New Sensor Map to create a new Sensor Map. (See previous section for information on creating Sensor Maps.) Once the map has been created, or if you already have a valid Sensor Map elsewhere on your hard drive, click on Select Sensor Map, navigate to that map, and click Open. If the network has not yet been initialized for this Sensor Map, the following message will appear.



Click okay to begin initialization. If you do not want to initialize at this time, click Cancel. You can force an initialization at any time from the Options menu. If you want to initialize all the connections in that Sensor Map, select Initialize - All. If you only want to initialize a particular connection in the Sensor Map, click on the connection you want to initialize, and then select Initialize - Selected. Any connections that are not initialized will be shown in red on the main Aqua4Push window. Any readings taken will ignore uninitialized connections.

If initialization is successful, the initialized connections will display in black on the main Aqua4Push window and no error messages will appear. You are now ready to begin taking readings.

If initialization is not successful, the following dialog box will display.



If the program is unable to verify the network, check the following:

- Check cable connections - Are all cables firmly attached?
- If using radios, check radio power - Is power turned on to all radios?
- Check that all radios have a clear line-of-sight path back to the master radio. (Refer to the *WaveData Instruction Manual* for radio trouble-shooting information.)
- Check the Sensor Map - Is it configured the same way your network is wired? (See previous section for further details on Sensor Maps.)
- Is the correct COM port selected in the Sensor Map?
- Radio and modem communication can be slow. If all of the above check out and you are using radios or modems, you can increase the Timeout Level for any affected connections in the Sensor Map. The Timeout Level is the time the program waits before deciding that communication has failed. In the same way, you can also increase the Retry Level. This is the number of times the program will try to take a reading before deciding it can't.
- If you believe the Sensor Map is correct, and the connections and settings appear to be correct, refer to the trouble shooting section later in this manual for more information.

Standard Operation

Once Aqua4Push successfully initializes it will begin to take and record readings on the schedule defined in the Sensor Map file. The main window will display as shown in Figure 5.

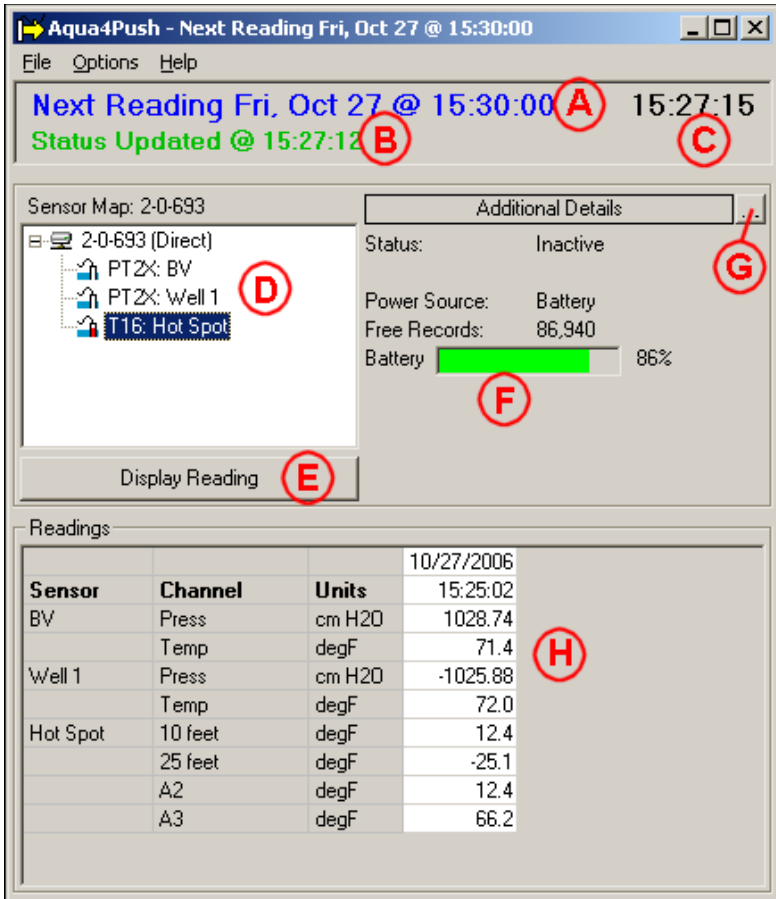


Figure 5: Main Aqua4Push Window

- (A) Time for next reading
- (B) Various status messages displayed here
- (C) Current time
- (D) List of connections, sensors and radios in your network
- (E) Click on the Display Reading button to display, but not record, a reading for the selected connection.
- (F) Various details for the selected sensor or radio.
- (G) Click here for the sensor address and additional details on the selected sensor.
- (H) Display of times and values read. Note: when reading all connections, only the last connection on the list will be displayed.

Aqua4Push is designed to be left running at all times! Minimize it and it will continue to run in the background, automatically taking readings as scheduled. You can use Aqua4Plus while this is running. If you are running Aqua4Plus, or any other program that uses the same COM port, when it gets close to the time to take the next reading, a message will pop up warning you that a reading is soon scheduled. If you continue to run the other program, the reading will simply be skipped.

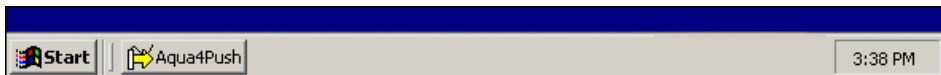


Figure 6: When Minimized, the Program Sits on the Task Bar

Viewing the Data Files

The data files are saved on your local computer, as well as optionally on an FTP site.

Local Data Files

Access the local data files from the File menu by selecting View Data Files. Each connection has a separate data file. Data is stored on the local machine in monthly files. The first part of the file name is the same as the file name on the connections panel in the Sensor Map. This name is then followed by a four digit year and a two digit month. For example, if the file name in the Sensor Map is *Red_River.csv*. The file on the computer will be *Red_River_2006-9.csv* for the September 2006 data file.

Remote Data Files

Access the data files on the FTP site by using either an FTP client program or via a web browser.

- Using an FTP Client - follow instructions for your particular FTP client software. The host is ftp.*hostname*.
- Using a web browser - Enter ftp://*user_id@hostname*.

In either case, you will be asked for a userid and a password. Your userid and host name are listed on the Upload Information panel in the Sensor Map. Each connection has a separate file name and can be uploaded to a different FTP site, if desired. If you are uploading to an INW site, INW will supply a password. If you are uploading to your own site, get the password from your administrator.

Data is stored on the FTP site in monthly files much like it is stored on the local computer, with one exception. The current file will not have a date extension. Thus your current file for any specific connection will always be the same. Keeping the current file name the same makes it easier for another program to automatically grab the current file to graph the results on a web page or use the data in some other program. On the first upload of a new month, a year and month extension will be added to the existing file and a new file will be created for the current month. (See Figure 7 for sample file names.)

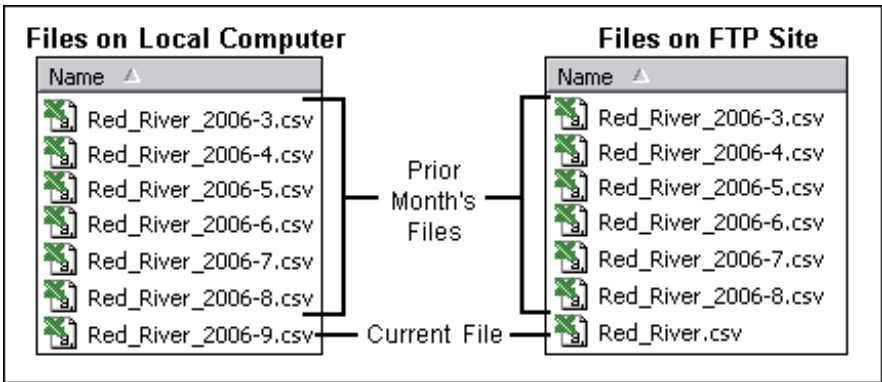


Figure 7: Files on local computer and on FTP site

File Format

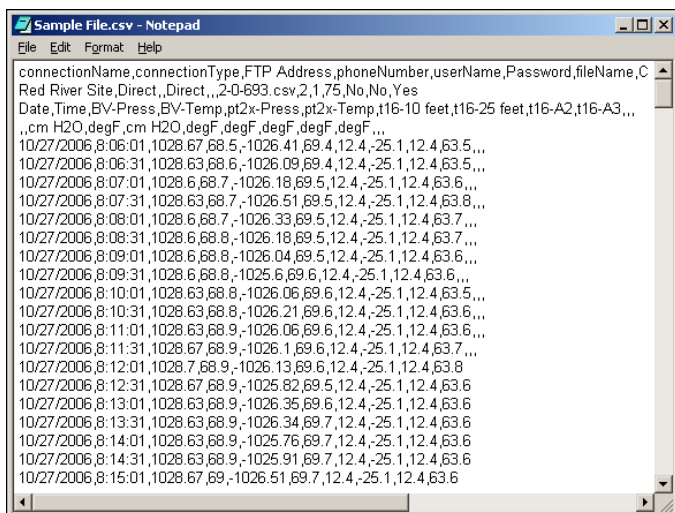
Data is saved in a comma separated value (.csv) format. Data files can easily be read with any text editor, MS Excel, and most data bases and spreadsheets. The first two lines of the file contain information from the Sensor Map. The third line contains sensor and channel column headers. Sensor names will display as assigned via the Sensor Map. Channel headers will display as assigned to the sensor via Aqua4Plus. The fourth line contains the units used for displaying the readings, for example, PSI or Ft H2O. The following lines consist of data only. Header lines may be written at later times, if information in the Sensor Map changes or the units change. You can force a new header to be written by clicking on the Options menu and selecting Send Map Header to Data File. You can send a new header to files for all connections or just to the selected connection. If for whatever reason, a channel is not read during a reading, that location in the file will be left blank.

Sample Data Viewed in Excel:

1	A	B	C	D	E	F	G	H	I	J
2	connectionName	connector	FTP Address	phoneNum	userName	Password	fileName	COMPort	RetryLevel	TimeoutLev
3	Red River Site	Direct		Direct			2-0-693.csv	2	1	75
4	Date	Time	BV-Press cm H2O	BV-Temp degF	pt2x-Press cm H2O	pt2x-Temp degF	t16-10 feet degF	t16-25 feet degF	t16-A2 degF	t16-A3 degF
5	10/27/2006	8:06:01	1028.67	68.5	-1026.41	69.4	12.4	-25.1	12.4	63.5
6	10/27/2006	8:06:31	1028.63	68.6	-1026.09	69.4	12.4	-25.1	12.4	63.5
7	10/27/2006	8:07:01	1028.6	68.7	-1026.18	69.5	12.4	-25.1	12.4	63.6
8	10/27/2006	8:07:31	1028.63	68.7	-1026.51	69.5	12.4	-25.1	12.4	63.8
9	10/27/2006	8:08:01	1028.6	68.7	-1026.33	69.5	12.4	-25.1	12.4	63.7
10	10/27/2006	8:08:31	1028.6	68.8	-1026.18	69.5	12.4	-25.1	12.4	63.7
11	10/27/2006	8:09:01	1028.6	68.8	-1026.04	69.5	12.4	-25.1	12.4	63.6
12	10/27/2006	8:09:31	1028.6	68.8	-1025.6	69.6	12.4	-25.1	12.4	63.6
13	10/27/2006	8:10:01	1028.63	68.8	-1026.06	69.6	12.4	-25.1	12.4	63.5
14	10/27/2006	8:10:31	1028.63	68.8	-1026.21	69.6	12.4	-25.1	12.4	63.6
15	10/27/2006	8:11:01	1028.63	68.9	-1026.06	69.6	12.4	-25.1	12.4	63.6
16	10/27/2006	8:11:31	1028.67	68.9	-1026.1	69.6	12.4	-25.1	12.4	63.7
17	10/27/2006	8:12:01	1028.7	68.9	-1026.13	69.6	12.4	-25.1	12.4	63.8
18	10/27/2006	8:12:31	1028.67	68.9	-1025.82	69.5	12.4	-25.1	12.4	63.6
19	10/27/2006	8:13:01	1028.63	68.9	-1026.35	69.6	12.4	-25.1	12.4	63.6
20	10/27/2006	8:13:31	1028.63	68.9	-1026.34	69.7	12.4	-25.1	12.4	63.6
21	10/27/2006	8:14:01	1028.63	68.9	-1025.76	69.7	12.4	-25.1	12.4	63.6
22	10/27/2006	8:14:31	1028.63	68.9	-1025.91	69.7	12.4	-25.1	12.4	63.6

Figure 8: Sample Data Viewed in a Text Editor

Sample Data Viewed in a Text Editor:



The image shows a Notepad window titled "Sample File.csv - Notepad". The window contains a CSV file with the following data:

```
connectionName,connectionType,FTP Address,phoneNumber,userName,Password,fileName,C
Red River Site,Direct,,2-0-693.csv,2,1,75,No,No,Yes
Date,Time,BV-Press,BV-Temp,pt2x-Press,pt2x-Temp,t16-10 feet,t16-25 feet,t16-A2,t16-A3,...
,cm,H2O,degF,cm,H2O,degF,degF,degF,degF,...
10/27/2006,8:06:01,1028.67,68.5,-1026.41,69.4,12.4,-25.1,12.4,63.5,...
10/27/2006,8:06:31,1028.63,68.6,-1026.09,69.4,12.4,-25.1,12.4,63.5,...
10/27/2006,8:07:01,1028.6,68.7,-1026.18,69.5,12.4,-25.1,12.4,63.6,...
10/27/2006,8:07:31,1028.63,68.7,-1026.51,69.5,12.4,-25.1,12.4,63.8,...
10/27/2006,8:08:01,1028.6,68.7,-1026.33,69.5,12.4,-25.1,12.4,63.7,...
10/27/2006,8:08:31,1028.6,68.8,-1026.18,69.5,12.4,-25.1,12.4,63.7,...
10/27/2006,8:09:01,1028.6,68.8,-1026.04,69.5,12.4,-25.1,12.4,63.6,...
10/27/2006,8:09:31,1028.6,68.8,-1025.6,69.6,12.4,-25.1,12.4,63.6,...
10/27/2006,8:10:01,1028.63,68.8,-1026.06,69.6,12.4,-25.1,12.4,63.5,...
10/27/2006,8:10:31,1028.63,68.8,-1026.21,69.6,12.4,-25.1,12.4,63.6,...
10/27/2006,8:11:01,1028.63,68.9,-1026.06,69.6,12.4,-25.1,12.4,63.6,...
10/27/2006,8:11:31,1028.67,68.9,-1026.1,69.6,12.4,-25.1,12.4,63.7,...
10/27/2006,8:12:01,1028.7,68.9,-1026.13,69.6,12.4,-25.1,12.4,63.8
10/27/2006,8:12:31,1028.67,68.9,-1025.82,69.5,12.4,-25.1,12.4,63.6
10/27/2006,8:13:01,1028.63,68.9,-1026.35,69.6,12.4,-25.1,12.4,63.6
10/27/2006,8:13:31,1028.63,68.9,-1026.34,69.7,12.4,-25.1,12.4,63.6
10/27/2006,8:14:01,1028.63,68.9,-1025.76,69.7,12.4,-25.1,12.4,63.6
10/27/2006,8:14:31,1028.63,68.9,-1025.91,69.7,12.4,-25.1,12.4,63.6
10/27/2006,8:15:01,1028.67,69,-1026.51,69.7,12.4,-25.1,12.4,63.6
```

Figure 9: Sample Data Viewed in a Text Editor

Testing & Trouble Shooting

Display Readings

If you want to view current readings from all sensors on a particular connection, click the Display Readings button on the Aqua4Push panel. The readings will be displayed on the panel, but will not be saved to the data file nor uploaded to the FTP site. See Figure 5 on page 14 for an example of displayed readings.

Test Mode

For testing purposes, Aqua4Push can be put into a test mode that takes readings every five minutes. It also saves the data to the normal output file and uploads the file to the FTP site. To initiate the test mode, select Test Mode from the Options menu. When the test mode is on, the Test Mode option on the menu will have a checkmark in front of it. Also, there will be a red banner at the top of Aqua4Push stating that it is in the test mode. To turn off the test mode, simply click on Test Mode on the Options menu to remove the checkmark. Readings will revert to the normal schedule, as set in the Sensor Map.

Immediate Update

If you want to see what would be collected in a normal scheduled update for all connections or a selected connection, you can force a reading. From the Options menu, select either Immediate Update - All or click on a specific connection and select Immediate Update - Selected. Aqua4Push will take a reading, save the readings to the normal output file, and upload the file to the FTP site, if using that function. The readings will also be displayed on the Aqua4Push panel. You can view the saved readings from the files saved on the local computer or from the FTP site.

Error Log

All errors encountered by Aqua4Push are recorded in an error log. To view the log, select the View Error Log option from the File menu. Each line in the error file will list the date, time, and an explanation of the error. See Table 1 for an list of common errors along with possible causes and/or solutions.

Table 1

Common Errors and Possible Causes/Solutions	
Common Errors	Possible Causes/Solutions
File Error: calData.inf is invalid	Network has not been initialized. Select a Sensor Map from the File menu. Program will attempt to reinitialize the network.
Initialization of sensor T16-Well5 failed	During initialization, the program was unable to verify a particular sensor. Be sure that sensor is defined properly in the Sensor Map. Check sensor cable connections to be sure that a good connection exists.
Unable to initialize network	Could not initialize the network. Check the following: <ul style="list-style-type: none"> • Sensor Map correct? • COM port correct? • Cable connections OK? • Timeouts and Retries set appropriately?
Reading sensor values: ** Communications Timeout **	Check your cable and/or radio connections.
Can't read PT2X: PT2X-Well7	Network initialized OK, but now cannot read a particular sensor. Check you cable and/or radio connections.
Cannot open output file:	Be sure you have not left the data file open after viewing.
Error: Unable to connect to remote host	Cannot connect to FTP host. Be sure host name, userid, and password are correct in the Sensor Map. Be sure your Internet connections are working.

Checking Sensor Communication and Addresses

If you believe your Sensor Map is correct, but you are still having trouble initializing the network, open Aqua4Plus and scan to find all connected sensors and radios. (Refer to the *Aqua4Plus Control Software Instruction Manual*.)

If you are able to find all sensors with Aqua4Plus, then your cable, radio, and modem connections are correct. If you can find everything from Aqua4Plus but not from Aqua4Push, verify that the same COM port, retry levels, and timeout levels are selected on both programs.

Use Aqua4Plus to check that the actual sensor addresses match the Sensor Map file. While the sensors are displayed on the sensor panel of Aqua4Plus, move the mouse over each sensor and radio and pause momentarily. A tool-tip box will pop up displaying that sensor's address (Figure 10). Compare this address to the one in the Sensor Map file for Aqua4Push. If they do not match, change either the Sensor Map file or reset the address on the sensor itself. See the *Aqua4Plus Control Software Instruction Manual* for details on setting sensor addresses. In either case, when you are done, close Aqua4Plus and reopen Aqua4Push. Select Initialize - All or Initialize - Selected from the Options menu.

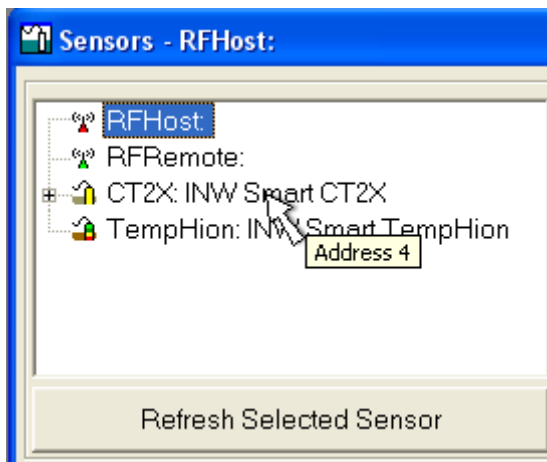


Figure 10: Aqua4Plus with Sensors Listed and One Address Displayed

Reference

Menus

File Menu

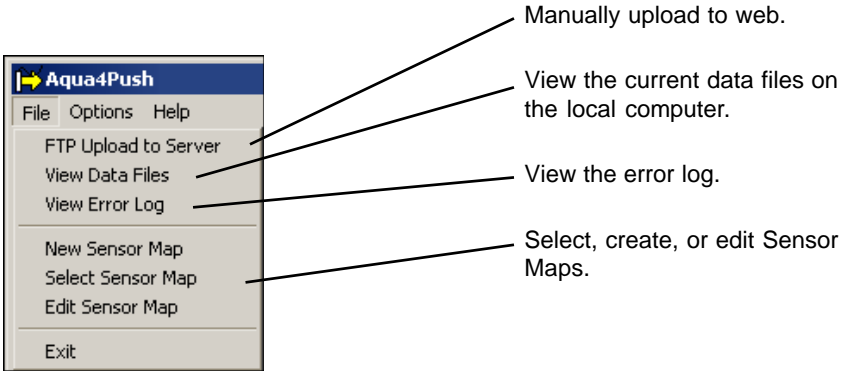


Figure 11: File Menu

Options Menu

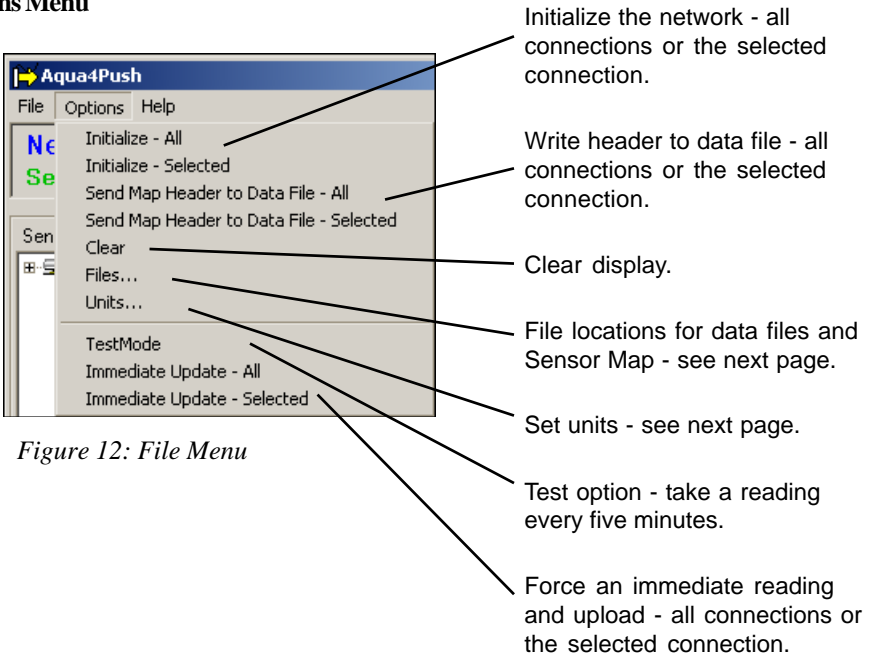


Figure 12: File Menu

Units

From the Options Menu, select Units... to set the units in which to display your data. This will control how data is represented on the main window and the data files. When you change units, a new header line will automatically be written to the data file, showing the new units.

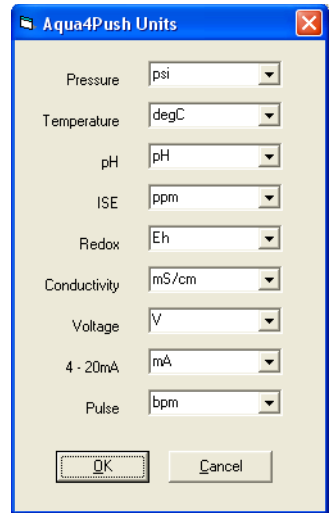


Figure 13: Units Dialog Box

File Locations Dialog Box

The File Locations dialog box gives information regarding the location of the current Sensor Map and the data files on your local computer. To open the File Locations dialog box, select Files... from the Options Menu.

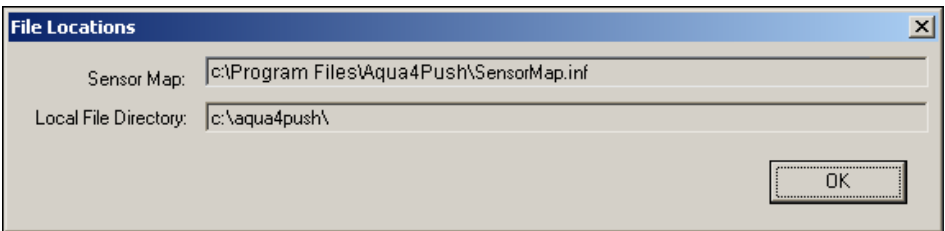


Figure 14: File Locations Dialog Box

Appendix A - Sample Network Wiring Diagrams

Following are wiring diagrams for four sample networks. Refer to respective hardware manuals for information on configuring and using specific sensors, radios, and modems. Contact INW for further details, if you have questions on configuring your network.

1. Directly to a PC
2. Via a dial out modem on the PC to a cellular modem at the sensor site
3. Via an Internet connection to a cellular IP modem at the sensor site
4. Via a WaveData Collection network

Sample Network 1: Directly Connected to PT2X Smart Sensors, T16 Temperature Sensors, and a Barometric Sensor.

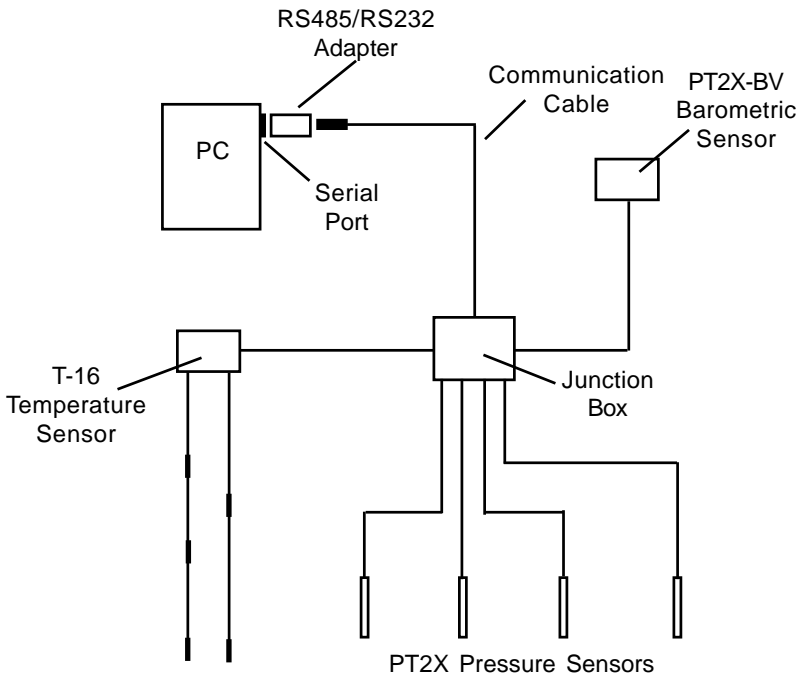


Figure 15: Sample Network 1

Sample Network 2:
Via a dial out modem on the PC to a cellular modem at the sensor site

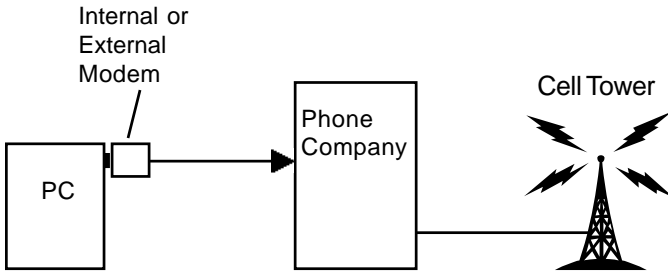


Figure 16: Sample Network 2 - Base Station

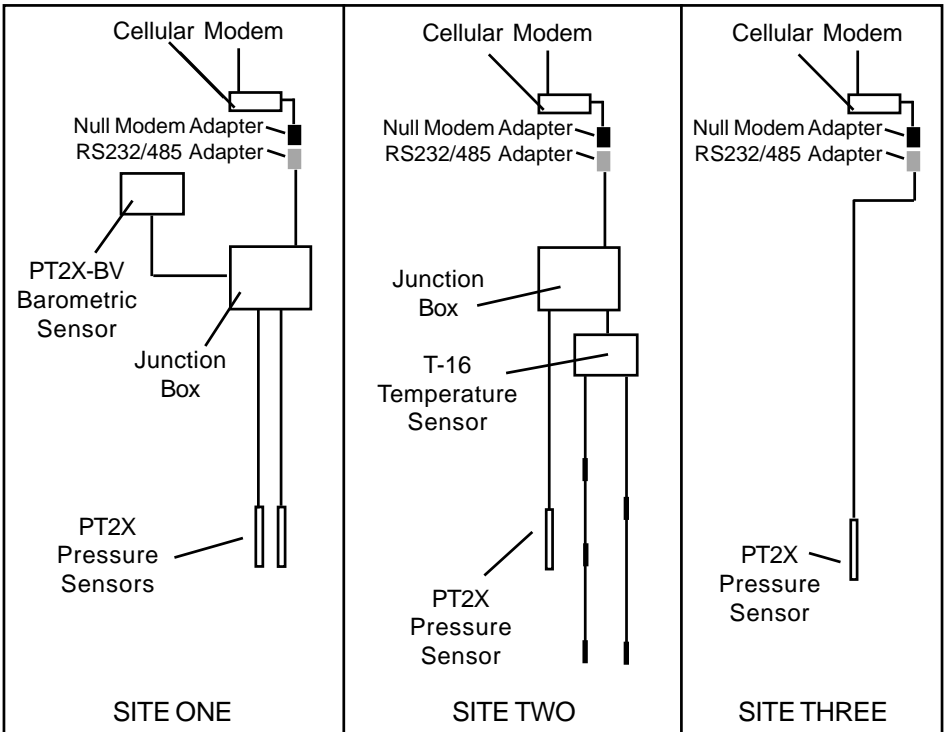


Figure 17: Sample Network 2 - Remote Stations

Sample Network 3:
Via an Internet connection to a cellular IP modem at the sensor site

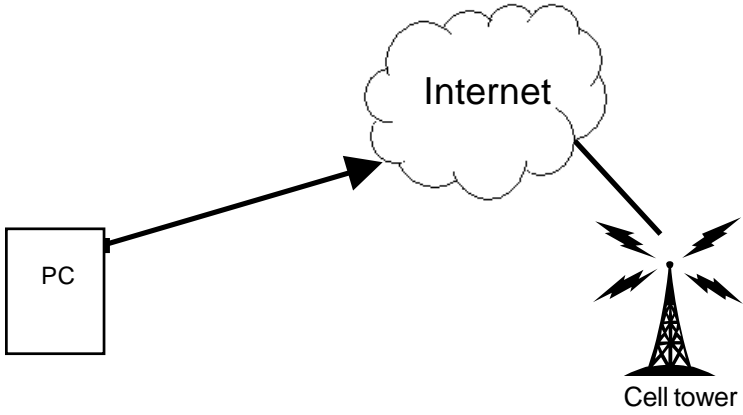


Figure 18: Sample Network 3 - Base Station

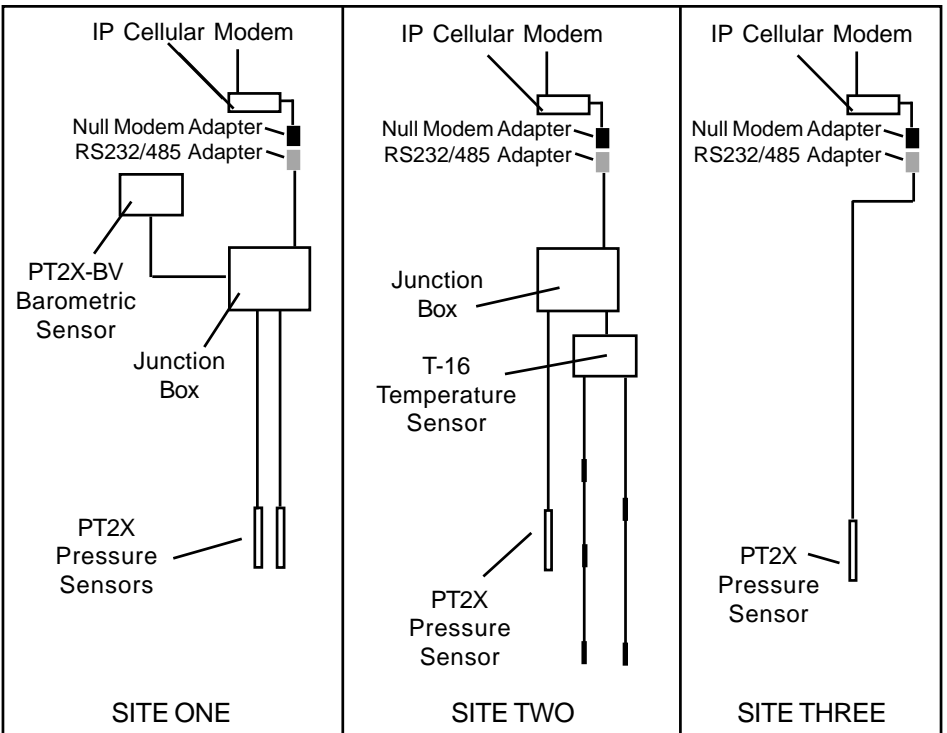


Figure 19: Sample Network 3 - Remote Stations

**Sample Network 4:
Via a WaveData Collection network**

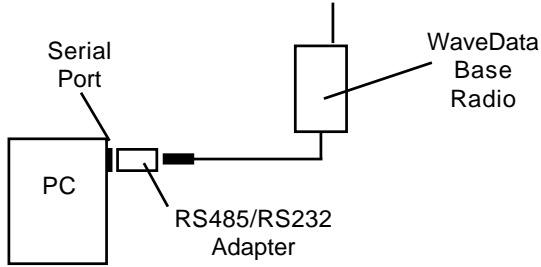


Figure 20: Sample Network 4 - Base Station

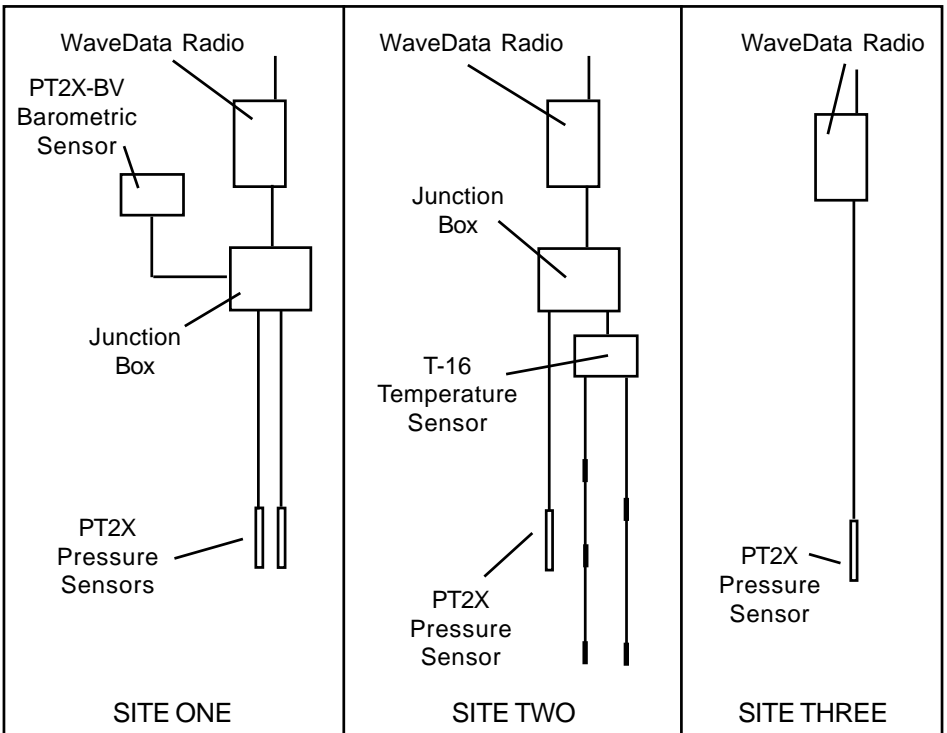


Figure 21: Sample Network 4 - Remote Stations

Reordering Information

For sales & service offices, please contact:

Instrumentation Northwest, Inc.

www.inwusa.com

800-776-9355

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