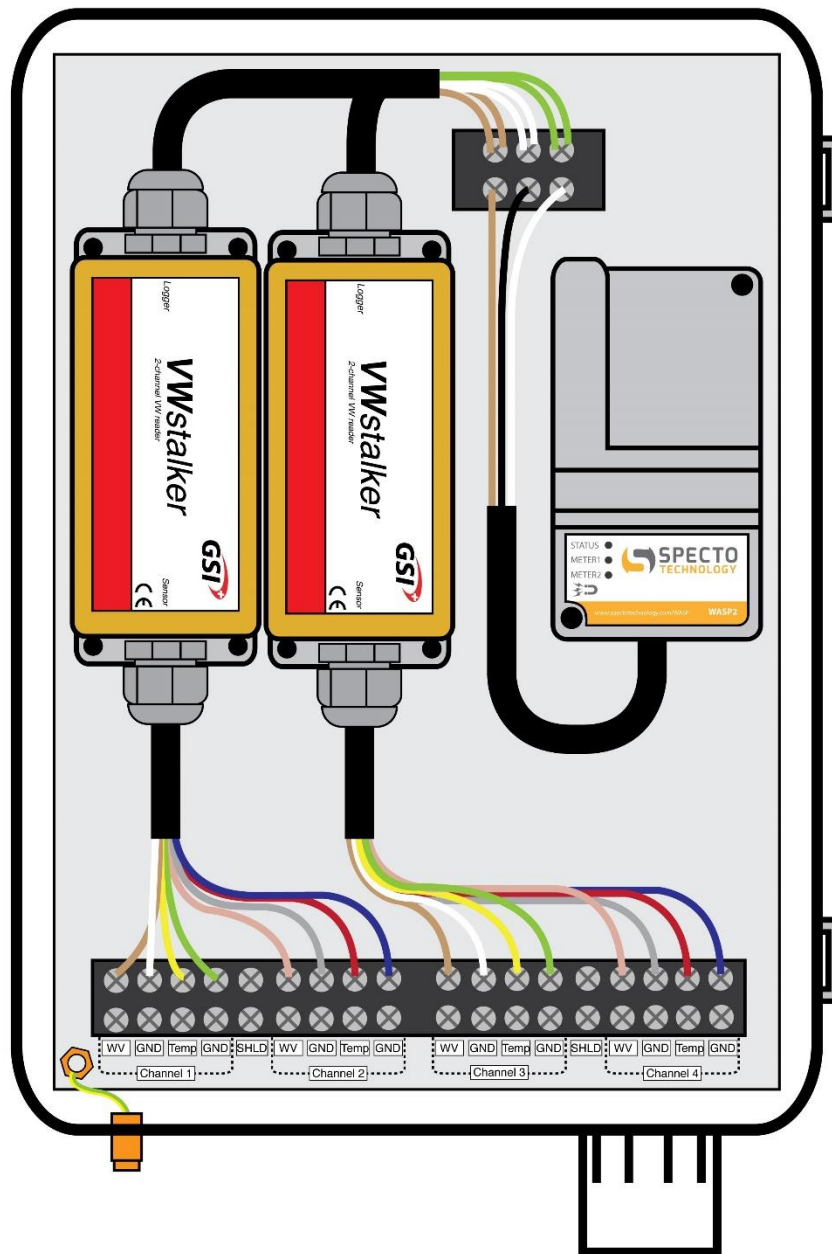


# WASP-VW Datalogger

## - with vibrating wire interface

### User Manual

Updated: Jan 2019



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## 1 Introduction

The WASP-VW is a variant of the popular WASP mA datalogger that is extremely compact, easy to use, low power & quick to deploy. The WASP-VW takes readings from vibrating wire sensors (using the zero-crossing method) and their built-in thermistors & transmits the readings wirelessly over the mobile Internet to the secured and dedicated WASP web portal for storage, processing, display or forwarding for further processing. Controlling and configuring the logger is very simple and is done using the same cloud-based web portal.

The WASP-VW comprises two parts: the digital WASP datalogger (WASP-D) and the VWstalker vibrating wire interface. Each VWstalker has 4 channels, 2 for the VW sensors and 2 for the thermistors. Each WASP-D can power and control up to 2 VWstalkers while running on its internal battery pack. The WASP-D communicates with the VWstalker using the SDI-12 protocol.

Prior to installation, the VWstalker can be programmed and pre-wired to the WASP-D. Once on site, VW sensors are connected to the sensor leads from the VWstalker. The user then logs on to the web portal to configure the sensors and set up a logging and reporting schedule.

The WASP-VW is ideal for new and retro-fit geotechnical and structural monitoring projects where unattended data collection of readings from vibrating wire sensors is required.



### Beautifully Simple

Simple to install. No on-site concentrator or software required.



### Long Battery Life

The internal lithium batteries will last years



### Graphs & Reports

Simple website data analysis and system management



### Global Coverage

Install the device anywhere with GSM mobile phone coverage



### Email & SMS Alarms

sent via email or text message



### Group Management

Manage large numbers of devices with group management and maps

## 2 Overview of Operation

The WASP-VW is designed for quick deployment in the field with minimum requirement on time, tools and skill as illustrated by the work flow below:

### 2.1 Before you go to site:

- a. Take note of the WASP-D and VWstalker serial numbers - Each WASP-D and VWstalker are assigned unique serial numbers, such as OP8783 & 200003, respectively.
- b. If you need to change the settings of the VWstalker from its default values, program the VWstalker using a VWstalker Programmer - see Appendix D
- c. Connect WASP-D to VWstalker

### 2.2 When you are in the field:

- a. Install sensor if this is a new installation
- b. Take note of the sensor's type and serial number
- c. Connect sensors to VWstalker - see Section 5
- d. Install WASP-VW - see Section 6
- e. Activate WASP-D using a magnet and check and confirm GSM signal strength - see Section 7

### 2.3 After returning from site:

- a. Log on to WASP web portal [www.spectotechnology.com/wasp](http://www.spectotechnology.com/wasp) to configure logging frequency, uploading frequency and charts and alarms as necessary - see Section 7
- b. Start monitoring

### **3 WASP-VW Datalogger**

#### **3.1 General**

The WASP is a compact datalogger that comes with everything needed to take reading from the sensors, to store readings on board and then to transmit the readings wirelessly to the cloud. Users are not required to provide a separate wireless modem, battery pack, antenna or SIM card for active mobile data plan to work.

The WASP-VW datalogger comprises two parts:

- The digital WASP datalogger (WASP-D)
- The VWstalker vibrating wire interface.

Each VWstalker has 4 channels, 2 for the VW sensors and 2 for the thermistors.  
 Each WASP-D can power and control up to 2 VWstalkers while running on its internal battery pack.  
 The WASP-D communicates with the VWstalker using the SDI-12 protocol.

### 3.2 Datalogger Models

This user guide covers the below listed datalogger models.

Datalogger Models	Description
WASP2-3G-2VW	WASP with 3G modem module and single VWstalker, reads 2 x VW sensors
WASP2-3G-4VW	WASP with 3G modem module and dual VWstalkers, reads 4 x VW sensors

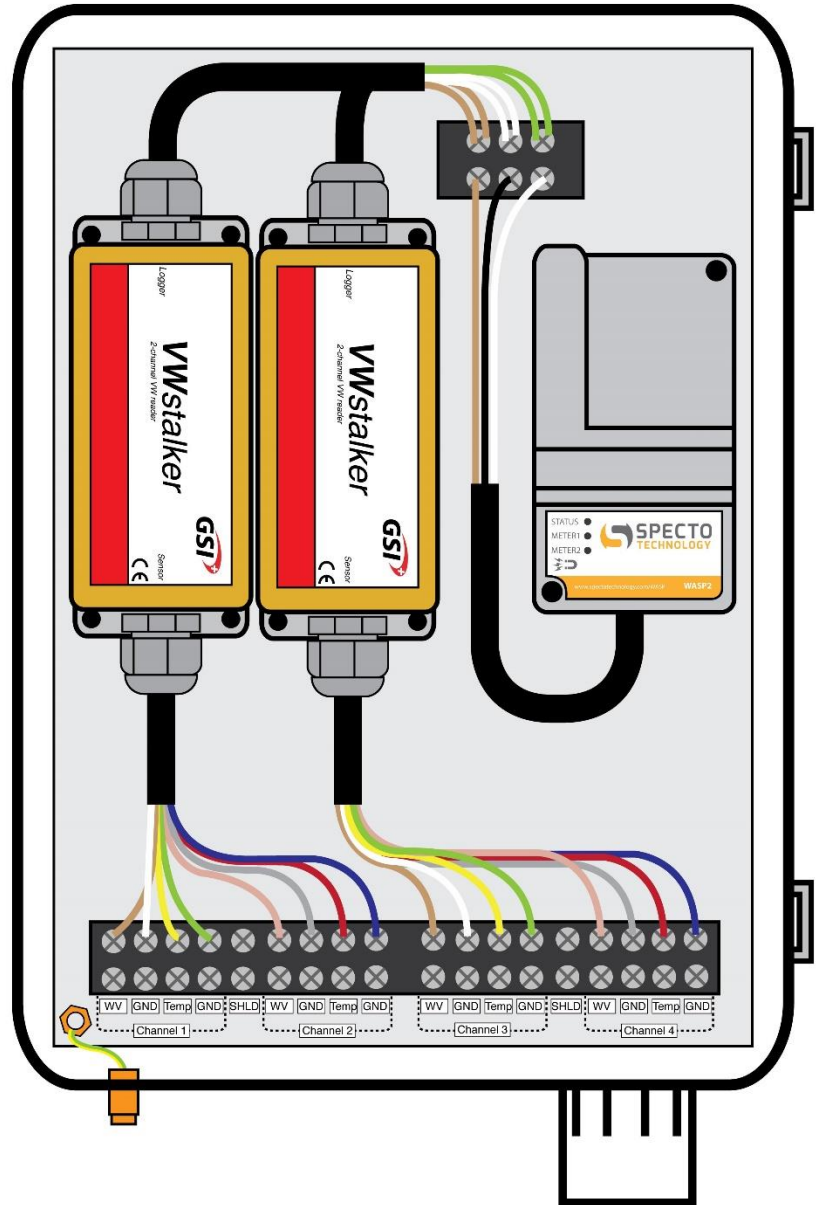
N.B. Maximum number of VW channels = 4

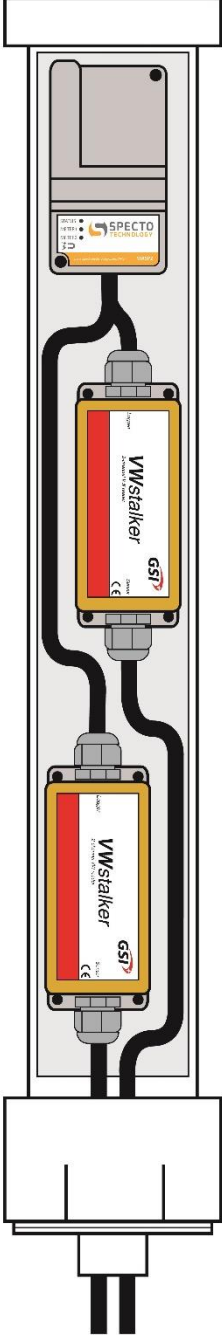
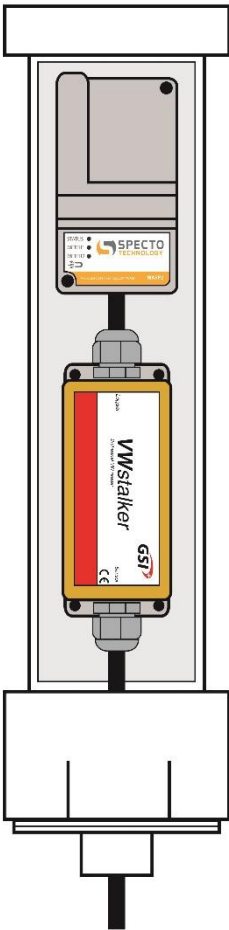
### 3.3 Compatible Sensors

The WASP-VW works with vibrating wire sensors and their built-in 3KΩ resistance thermistor sensors from all quality vibrating wire instrument manufacturers.

### 3.4 Mounting and Enclosures

The circuit boards of both WASP-D and VWstalker are fully potted in a water and dust proof compound and can be left in a man-hole, strapped to a pole with hose clamp or mounted directly on to wall in the field without an additional enclosure. However, if necessary, they can be housed in box or tubes for extra protection (see sketches on previous page and below).







## 4 Datalogger Connection

### 4.1 WASP-D Wiring

WASP-D has one pigtail cable with 3 wires:

WASP Wire Color	WASP Wire Color for loggers with SN<3000	Functions
RED	BROWN	POWER
GREEN	BLACK	GROUND
BLUE	WHITE	DATA

### 4.2 VWstalker Wiring

VWstalker has 2 pigtail cables, one on the end marked "Logger" for connection to the WASP-D or the VWstalker Programmer and another one on the end marked "Sensor" for connection to the VW sensors.

1. The "Logger" cable has 3 wires:

VWstalker "Logger" Cable Wire Color		WASP Wire Color	Functions
V2 (white stalker)	V5 (black stalker)		
BROWN	RED + WHITE	RED	POWER
WHITE	GREEN	GREEN	GND
GREEN	BLACK	BLUE	DATA

2. The "Sensor" cable has 8 wires:

Channel	Sensors	VWstalkerV2 Wire Color	VWStalkerV5 Wire Color
1	Vibrating Wire	BROWN	RED
	GND	WHITE	BLACK
	3K Thermistor	YELLOW	WHITE
	GND	GREEN	GREEN
	Chassis Ground	-	GREEN AND YELLOW
2	Vibrating Wire	ROSE	RED
	GND	GREY	BLACK
	3K Thermistor	RED	WHITE
	GND	BLUE	GREEN
	Chassis Ground	-	GREEN AND YELLOW

Notes:

- All GND are connected to the metal back plate of the VWstalker enclosure (Housing Ground)
  - Proper grounding of VWstalker housing is recommended to improve reading quality
- VWstalker only works with 3K thermistors

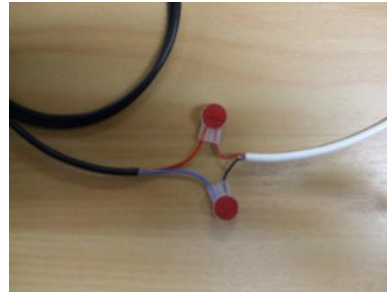
### 4.3 General Notes on Sensor Connection

It is extremely important to ensure that no moisture can get into the cable join between the WASP-D cable & VWstalker cable and the VWstalker cable & sensor cable. If moisture enters the cable join, the join will rust over time and will cause the signal from the sensor to stop being registered. Water can in some cases travel up the cable core into the logger or the sensor and damage the internal circuitry.

The "3M ScotchLok UY2 Insulation Displacement Wire Connectors" and crimper are recommended for splicing the signal cables together.



Crimping Pliers



As an alternative to splicing cable, water resistant connectors may be provided upon request.

## 5 WASP-D Positioning General Guidelines

Placement of the WASP-D is important to ensure adequate GSM signal strength is available. Poor GSM signal strength may cause the WASP to make more attempts than normally required to contact the website and therefore exhaust the internal batteries more quickly. It can also cause a delay in sensor readings being transferred to the website.

Poor signal starts to affect battery life at around 30% GSM signal strength, and generally will be too low for normal operation at less than 20% signal strength.

If an WASP-D is left installed in an area with poor signal strength expect to see the unit appearing “offline” from time to time, and the website battery gauge to show a higher than normal battery drain rate.

Very poor GSM signal strength can result in the WASP-D device lasting less time than the rated battery life, or not connecting at all.

- Do not install inside a metal cabinet
- Avoid installing inside metal room, basement or room with concrete walls
- If possible elevate as much as possible, installation in pits or underground not recommended. (While this is not strictly recommended, if signal strength in the area is strong, it is possible that data may be transmitted to the web, through the manhole or roadbox lid. Testing on site will confirm if this is possible)

If sufficient signal can't be obtained at or near the desired site consider using a WASP variant with external antenna connection & an external antenna to improve signal performance.

## 6 Confirming GSM Signal Strength




Once a suitable installation position has been identified there are several tools available for the installer to confirm the GSM signal strength is sufficient and also that attached meters & sensors are functioning normally:

- Magnet activation with light feedback - covered in Section 6.1
- Smartphone mobile web app - covered in Section 6.2
- Normal PC based web-browser - covered in Section 7

### 6.1 Using the WASP Magnet Activation System

Using a small magnet, the WASP can be forced to attempt an immediate connection to the website. A successful connection will validate the GSM coverage at the chosen installation location and also upload details of signal strength and recorded sensor data to the website. The installer may view the results of the signal strength by using the smartphone App. (see next section).

In order to activate the GSM connection with the magnet, complete the following steps:

a	Hold the magnet over the magnet icon as shown in the figure to the right.	
b	When holding the magnet in this position, the LED light will flash <b>BLUE</b> . Continue to hold the magnet in place until <b>BLUE</b> LED becomes solid. The WASP will now be in "Active Mode".	
c	Remove the magnet and wait for the WASP to make a successful connection to the website (indicated by the LED light turning <b>GREEN</b> ).	

### 6.1.1 Attempting Connection

After holding the magnet over the symbol on the label, the LED light will flash **BLUE**. The magnet must be held over the WASP until the light goes from flashing to solid (after about 5 x flashes). The WASP is now in “Active” mode.

The **BLUE** LED will be solid for several seconds before turning off.

The WASP will now attempt to connect to the website (indicated by a flashing **BLUE** LED light) by connecting to the local GSM cell-phone tower and transferring data to the website. This process typically takes 30-60 seconds, but may take up to several minutes. The process may take longer if:

- i. The unit has recently been transported from a different country or region. In this case it may be attempting to find the correct GSM operator
- ii. The unit has a lot of data to upload from the internal memory

### 6.1.2 Successful Connection

Once successful connection is made, the LED light will turn **GREEN** (and hold steady for several seconds).

### 6.1.3 Failed Connection

Upon a failed connection to the website, the LED light will turn **RED**. Failure to connect could be the result of the following problems:

- i. Unit has not yet identified a cell-tower to connect to – this can occur the first time a unit is activated.
- ii. Insufficient Signal strength - there may not be enough signal for a full GSM connection. Try to move unit to a higher or more open location.
- iii. Temporary GSM network problem. Test the 3G network with your smart phone (in the USA: AT&T & T-Mobile only), if it's OK then retry with the WASP.
- iv. Damaged WASP unit. The unit has been damaged since last used. Check connections to meters/sensors have not mistakenly fed high voltages into WASP device.

## 6.1.4 LED Lights

The following table describes the reasons for various light signals:

<b>BLUE Flash</b>	<b>Description</b>
1 flashes	Device has a Low signal on registered network
2 flashes	Device has a Medium signal on registered network
3 flashes	Device has a High signal on registered network
SOLID flash	Device is ON

<b>RED Flash</b>	<b>Description</b>
1 flashes	Config Mode / No SIM
2 flashes	Could not register on network
3 flashes	Problem Reading CSQ (signal strength may be too weak)
4 flashes	Could not Connect to website due to failed network connection; network registration successful but no network connection. This could be due to connecting to the wrong network hence not getting a network connection
5 flashes	Couldn't establish TCP connection
6 flashes	HTTP Retry limit reached
7 flashes	Too many Unexpected Resets (>5); unit will go to sleep for a day
8 flashes	Connection Timed out
9 flashes	Radio Failed

<b>GREEN Flash</b>	<b>Description</b>
5 flashes	Successfully Entered Transport Mode
SOLID flash	Success, Completed upload and configuration of device

### **PLEASE NOTE:**

***If connection is unsuccessful, you may need to retry the magnet activation several times. Especially if it is the first time you are activating the WASP.***

## 6.2 Using a Smartphone to Check Installation

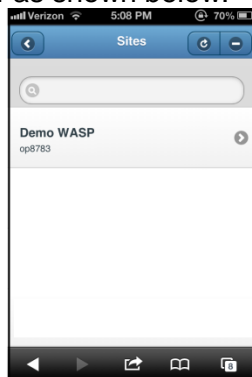
Use a smartphone to get immediate feedback on the status of the WASP installation by navigating to [www.spectotechnology.com/wasp](http://www.spectotechnology.com/wasp) and clicking on the “Go To Mobile Version” button.



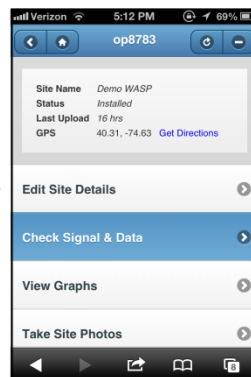
You will then be directed to the Outpost Central mobile login screen. Login and select the WASP you would like to check the signal of as shown below:



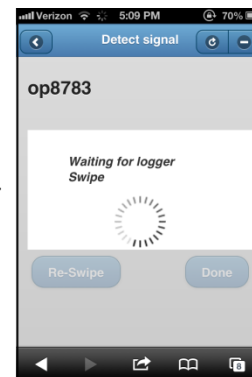
1. Login



2. Select WASP



3. Check Signal



4. Activate WASP with magnet

Once you get to Step #4, activate the WASP by holding the magnet over the label to force a connection to the web. Once the WASP connects to the website, the signal strength is shown in the mobile app. The latest sensor readings are available to view from the full website.

The full WASP website portal may also be accessed on smartphones by logging into [www.spectotechnology.com/wasp](http://www.spectotechnology.com/wasp) in the normal way (without selecting the Mobile Version option).

## 7 WASP Management Portal Website

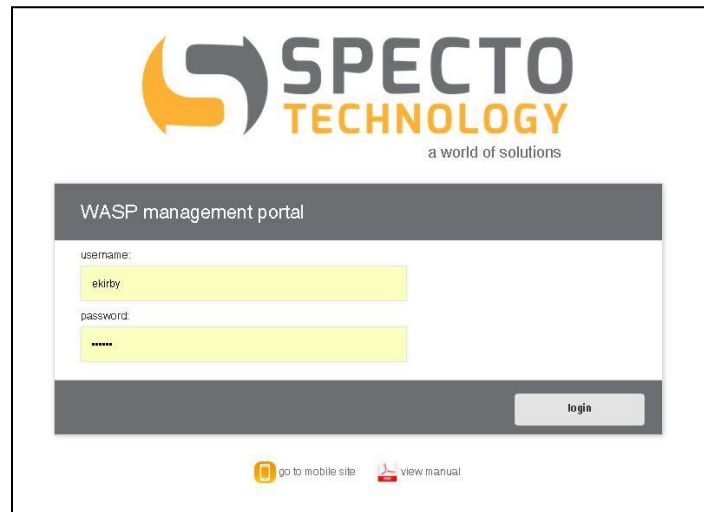
All the WASP's settings and controls are accessible through wireless communication over the Internet from the WASP Management Portal. The web address of the Management Portal is:

<http://www.spectotechnology.com/wasp>

The web portal is used to program the WASP's reading schedule and method. It may also be used to display data graphically, generate reports and send automated alert emails in case of a sensor exceeding a predetermined threshold.

Data may also be pushed to an external ftp site for import into the user's choice of display software (e.g. MissionOS, ARGUS, VDV, etc.).

When you open the above web address with an Internet browser, you will see the screen below:



Log into the WASP Management Portal using the username and password provided to you by Specto Technology.

The web portal comprises of two different sections:

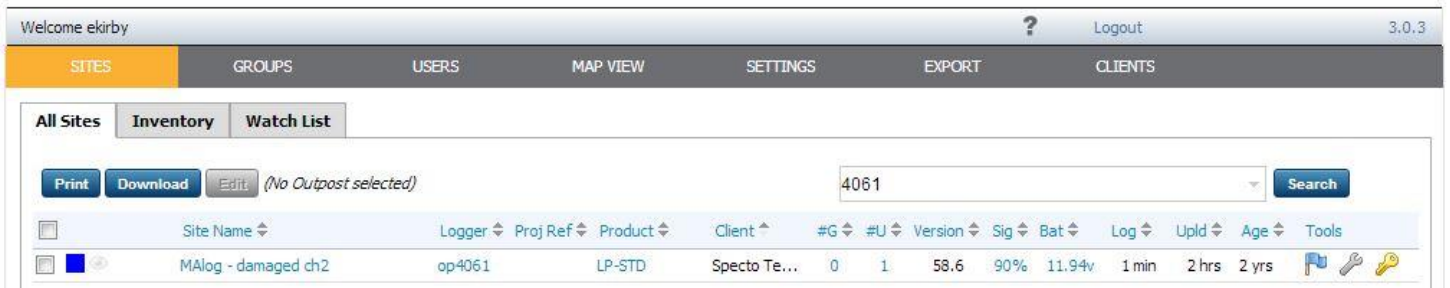
- **Configuration** site (Section 7.1)
- **Data Display** site (Appendix B)

Further details are provided in the following Sections.

### 7.1 Main Menu Items

You may access the various features of the Configuration Site by clicking on the menu items across the top (Sites, Groups, Users, Map View, Settings, Export, Clients). See example screen shot below.





## 7.2 "SITES" Tab

After logging into the WASP management portal (as a Site Administrator or Client), a screen similar to the one shown below will appear:



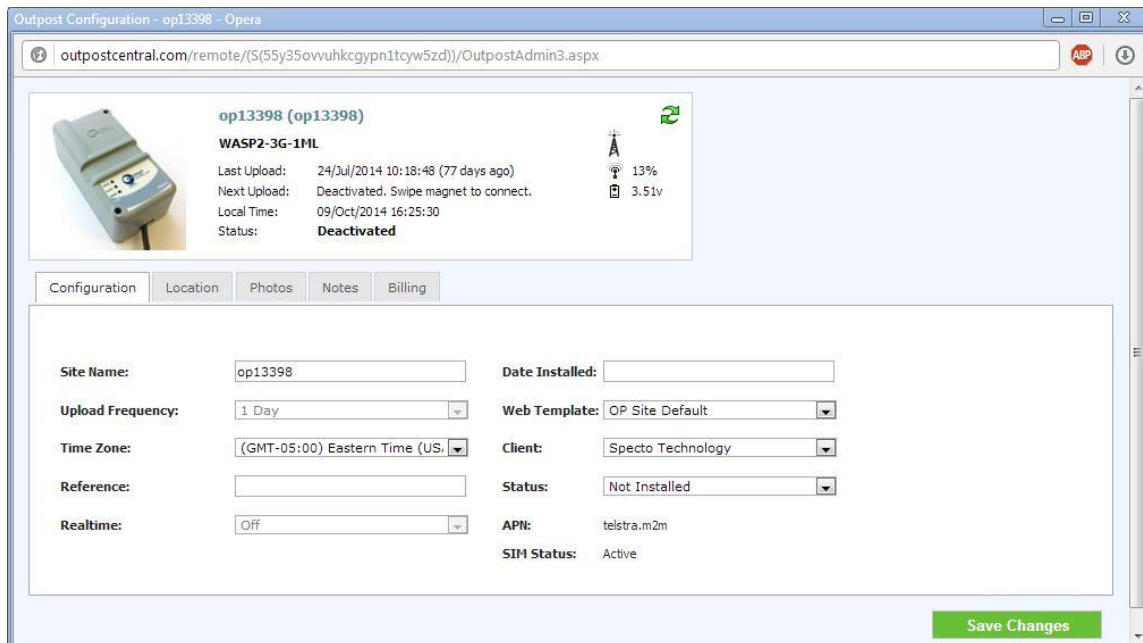
The term "Site" refers to a WASP datalogger. All WASPs associated with a user's account are listed on under this tab. By default, only active WASPs appear in the Site Name column. You may view Not Installed or Deactivated WASPs associated with your account by clicking the ["Click here to show all"](#) link (shown above in the red circle).

### ❖ "Site Name" & "Logger" columns

Clicking on either field will bring up a window (shown below) where you may view/edit various features.

- **Status Screen** - View the status of WASP, such as signal strength and battery voltage when it was last connected.
- **Configuration** - Edit the Site Name, Time Zone, Project Reference, Installation Date, Web Template ("OP Site Default" should be used) & Status.
- **Location** - Enter location information.
- **Photos** - Photos may only be uploaded using the mobile web-app.
- **Notes** - Add or edit a note.
- **Billing** - Change the current billing status - deactivate or active (please advise Specto Technology before doing this to ensure that correct changes are applied to your account).

Each time a change is made to the configuration, you must click the green "Save Changes" button for changes to take effect.



#### ❖ "#G" (Groups) & "#U" (Users) columns

Clicking on either field will allow a user to either view or edit the respective settings.

#### ❖ "Sig" (Signal) & "Bat" (Battery) columns

Clicking on either field will bring up a graph that displays the respective data of the WASP. If the latest data is not immediately visible, simply change the range below the graph to be to an earlier time.



#### ❖ "Log" & "Upld" (Upload) columns


The Log column shows how often the WASP is collecting readings from sensors. Details on how to edit this schedule is given in the following section.


Upload Frequency is set to 1 day by default. Data upload will happen at around midday every day. If you would like to have the daily data uploaded at a different time of the day ("Roster" option), please contact Specto Technology.

Multiple uploads per day may be available; however, the battery life will be affected. Please contact Specto Technology if you would like to change the upload frequency (maximum of twice per day).

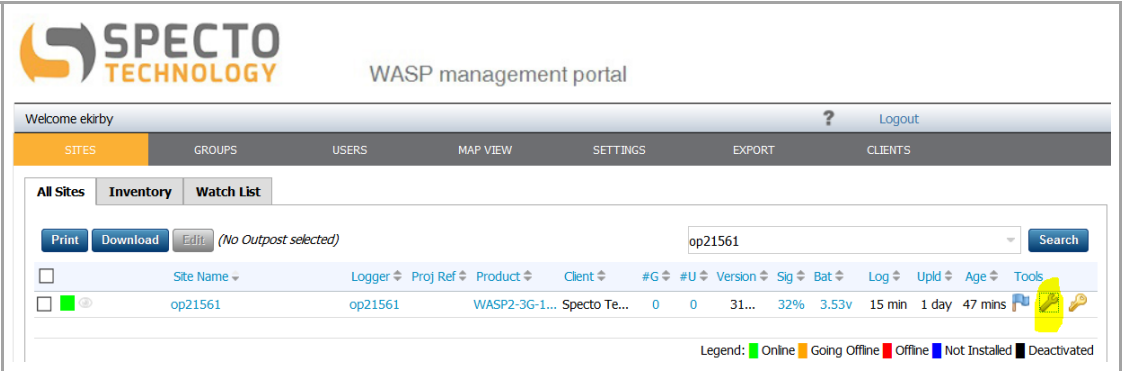
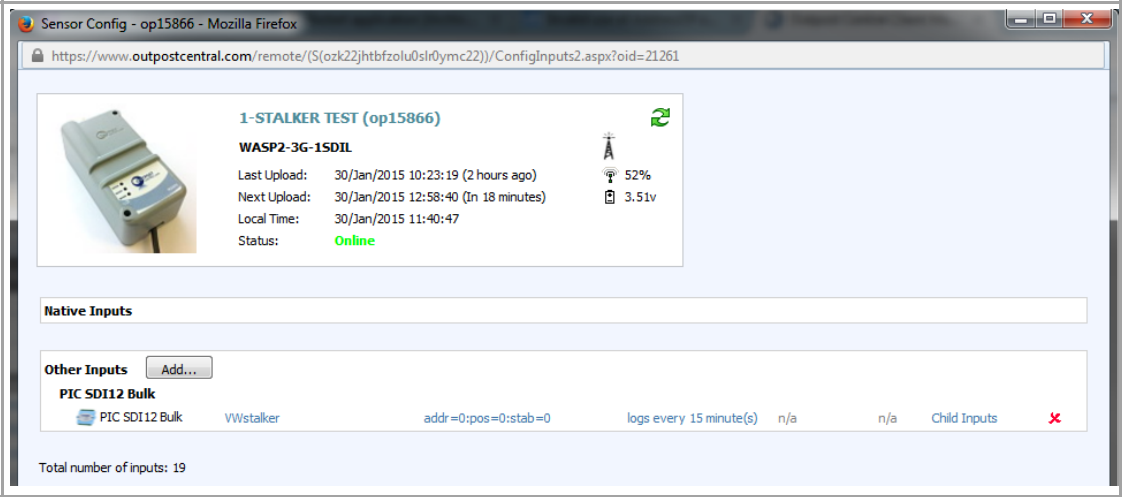
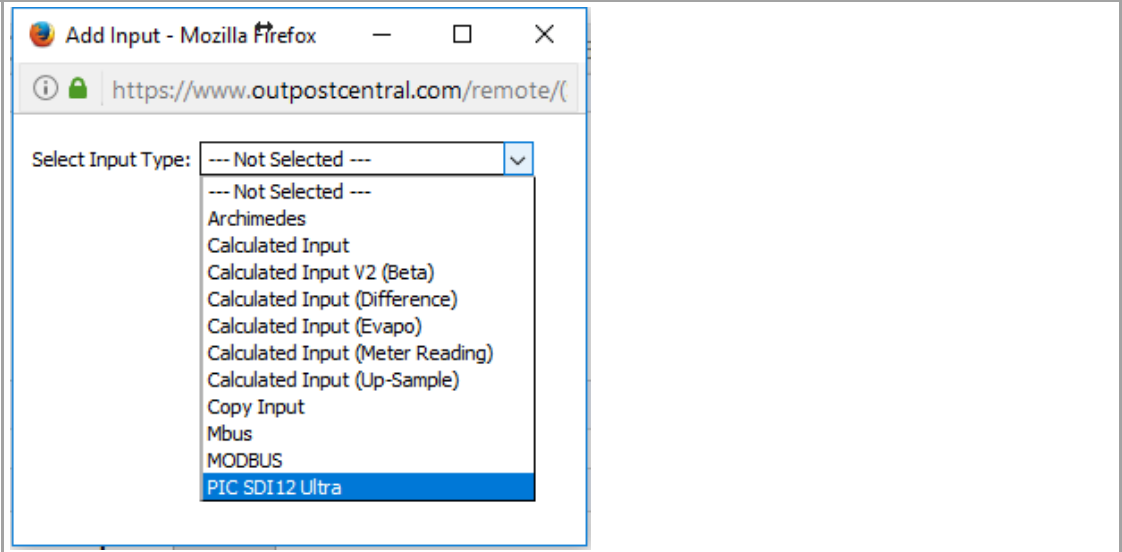
#### ❖ "Tools" column

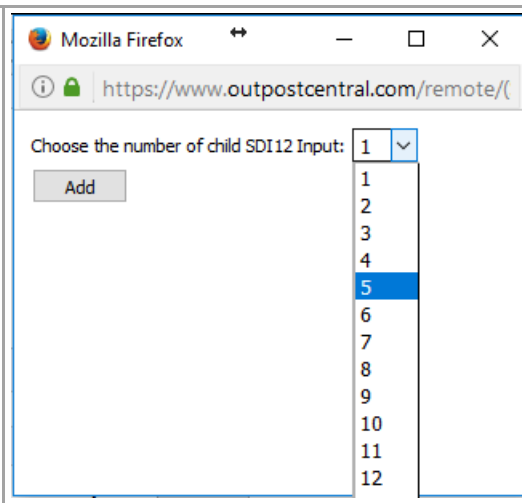
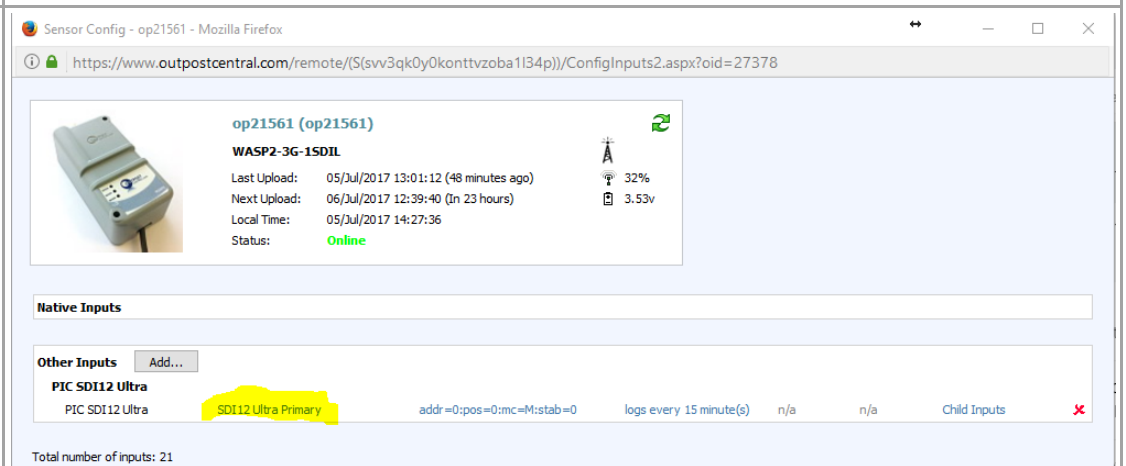
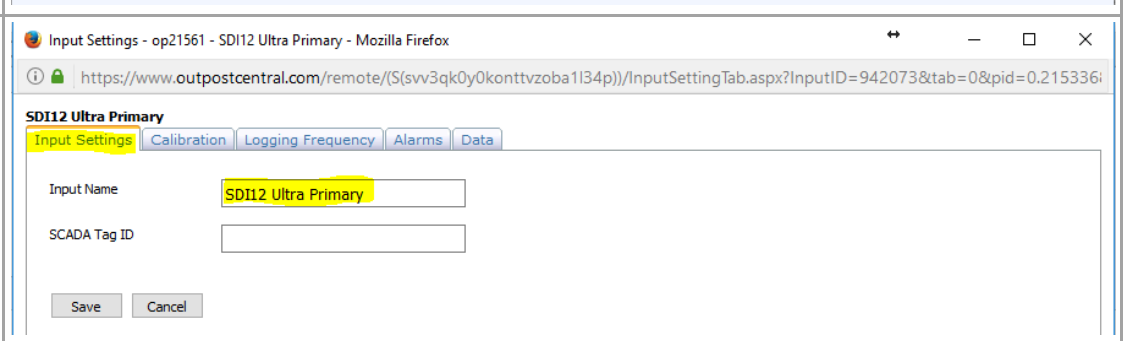
-  **View Events** - click on the blue flag to view a log of events from the WASP-D, including sensor readings and communication attempts.
-  **Config Sensors** - click on the grey wrench to change the configuration of the VWstalkers being read by the WASP-D. Each VWstalker has unique configuration settings, these may be edited by clicking on the Input name.  
Editable fields include the sensor name, stabilization time, logging frequency and Child Inputs (more detailed information is given in the following section, 7.2.1).

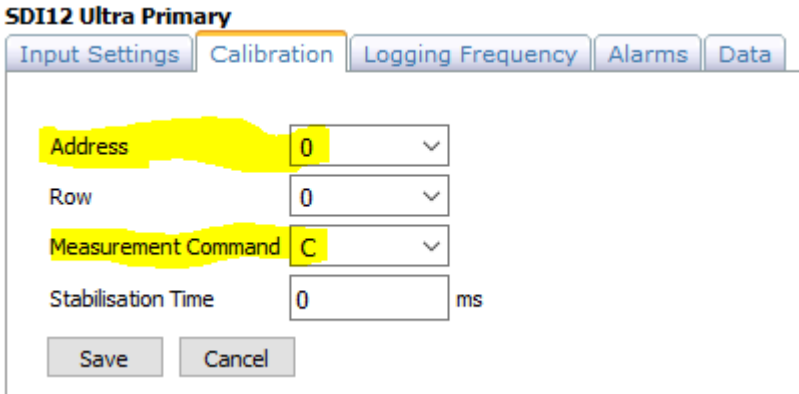
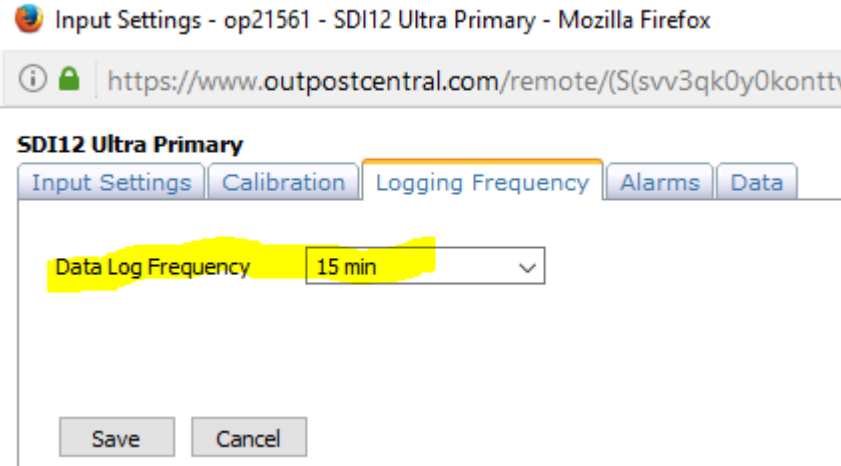
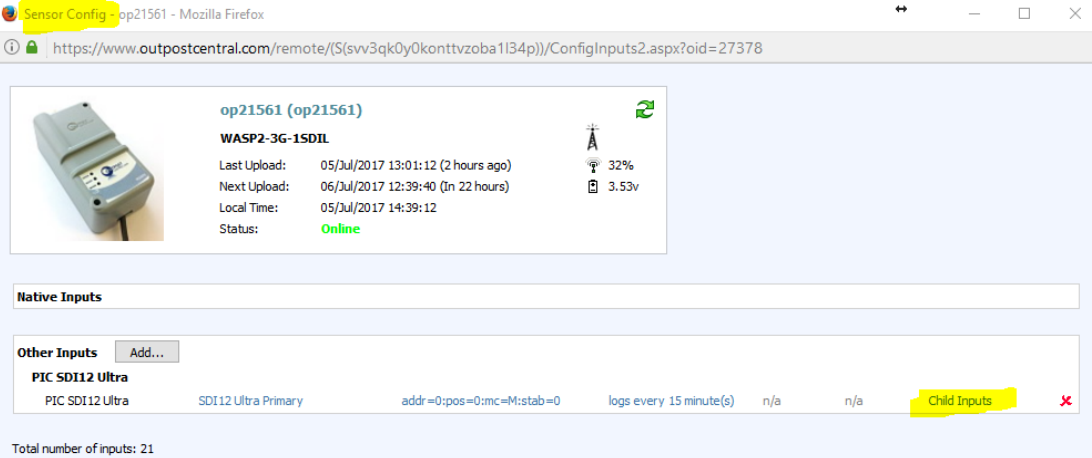
Each time a change is made, you must click  to confirm changes.

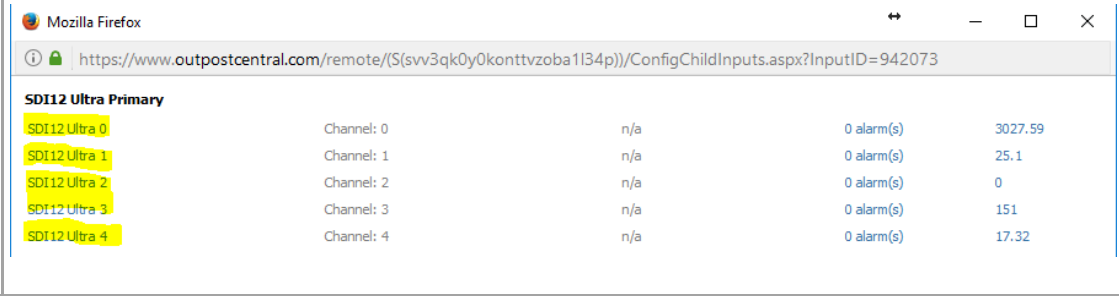
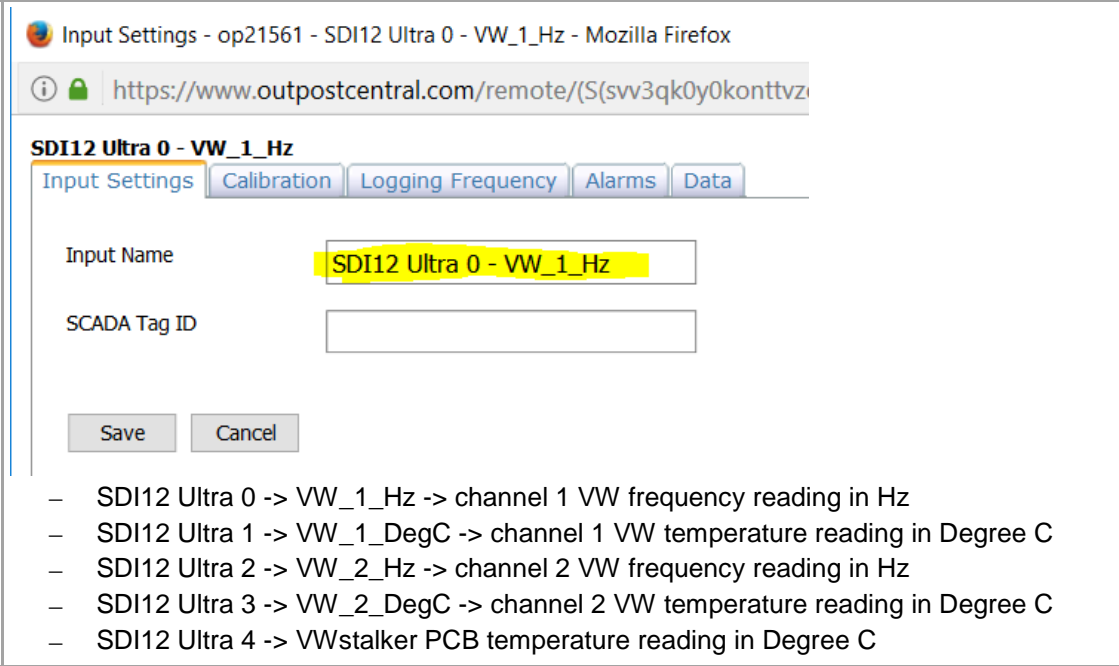
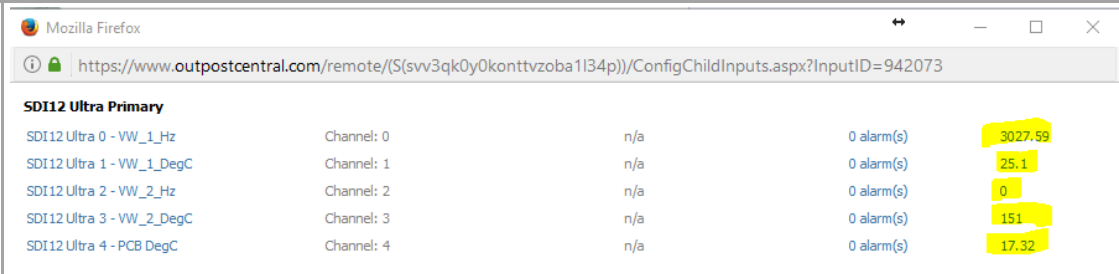
-  **Login** - click on the golden key to login to the “**Data Display**” area of the website. This allows you to view and edit any plots, images and tables associated with the WASP-D. See Appendix B for details.

## 8 Configuring WASP-D to Work with VWstalker - DETAILED INSTRUCTIONS

<p>1</p> <p>Select the "Spanner" icon in Tools</p>	 <p>The screenshot shows the 'WASP management portal' with a navigation menu (SITES, GROUPS, USERS, MAP VIEW, SETTINGS, EXPORT, CLIENTS) and a sub-menu (All Sites, Inventory, Watch List). Below is a table of sites with columns for Site Name, Logger, Proj Ref, Product, Client, #G, #U, Version, Sig, Bat, Log, Upd, Age, and Tools. The 'Tools' column for the first site (op21561) has a spanner icon highlighted in yellow.</p>
<p>2</p> <ul style="list-style-type: none"> <li>• There may be one or more entries of "PIC SDI12 Ultra" already. If this is the first or only VWstalker you are adding to the WASP, click on the red "x" to delete all existing entries, otherwise continue as below.</li> <li>• Click "Add"</li> </ul>	 <p>The screenshot shows the 'Sensor Config' page for '1-STALKER TEST (op15866)'. It displays a 'PIC SDI12 Bulk' input type selected in the 'Other Inputs' section. A red 'x' icon is visible next to the 'Child Inputs' label, indicating a delete action.</p>
<p>3</p> <p>Select "PIC SDI12 Ultra" from the drop-down list</p>	 <p>The screenshot shows the 'Add Input' dialog box in Mozilla Firefox. The 'Select Input Type' dropdown menu is open, and 'PIC SDI12 Ultra' is selected.</p>

<p>4</p> <p>Click "Ok" and select "5" in the drop-down list for number of child SDI12 Input</p>	
<p>5</p> <p>Click "SDI12 Ultra Primary" to open the window below</p>	
<p>6</p> <ul style="list-style-type: none"> <li>• In the "Input Settings" tab</li> <li>• Change the Input Name to a project specific name as necessary</li> <li>• Click "Save"</li> </ul>	

<p>7</p> <ul style="list-style-type: none"> <li>Go to "Calibration" tab</li> <li>Select Address of VWstalker (default is 0)</li> <li>Select C as the Measurement Command</li> <li>Do not change values in other fields</li> </ul>	 <p><b>SDI12 Ultra Primary</b></p> <p>Input Settings   <b>Calibration</b>   Logging Frequency   Alarms   Data</p> <p>Address: 0</p> <p>Row: 0</p> <p>Measurement Command: C</p> <p>Stabilisation Time: 0 ms</p> <p>Save Cancel</p>																										
<p>8</p> <p>Go to "Logging Frequency" tab and select the data log frequency required - we use 15 minutes here</p>	 <p>Input Settings - op21561 - SDI12 Ultra Primary - Mozilla Firefox</p> <p>https://www.outpostcentral.com/remote/(S(svv3qk0y0kontt...</p> <p><b>SDI12 Ultra Primary</b></p> <p>Input Settings   Calibration   <b>Logging Frequency</b>   Alarms   Data</p> <p>Data Log Frequency: 15 min</p> <p>Save Cancel</p>																										
<p>9</p> <p>Click on "Save" to return to the "Sensor Config" window</p>	 <p>Sensor Config - op21561 - Mozilla Firefox</p> <p>https://www.outpostcentral.com/remote/(S(svv3qk0y0konttvzoba1134p))/ConfigInputs2.aspx?oid=27378</p> <p><b>op21561 (op21561)</b></p> <p>WASP2-3G-1SDIL</p> <p>Last Upload: 05/Jul/2017 13:01:12 (2 hours ago) 32%</p> <p>Next Upload: 06/Jul/2017 12:39:40 (In 22 hours) 3.53v</p> <p>Local Time: 05/Jul/2017 14:39:12</p> <p>Status: Online</p> <p>Native Inputs</p> <p>Other Inputs Add...</p> <table border="1"> <thead> <tr> <th colspan="2">PIC SDI12 Ultra</th> <th colspan="2">SDI12 Ultra Primary</th> <th colspan="2">addr=0;pos=0;mc=M;stab=0</th> <th colspan="2">logs every 15 minute(s)</th> <th colspan="2">n/a</th> <th colspan="2">n/a</th> <th colspan="2">Child Inputs</th> </tr> </thead> <tbody> <tr> <td>PIC SDI12 Ultra</td> <td>SDI12 Ultra Primary</td> <td>addr=0;pos=0;mc=M;stab=0</td> <td>logs every 15 minute(s)</td> <td>n/a</td> <td>n/a</td> <td colspan="6">Child Inputs</td> </tr> </tbody> </table> <p>Total number of inputs: 21</p>	PIC SDI12 Ultra		SDI12 Ultra Primary		addr=0;pos=0;mc=M;stab=0		logs every 15 minute(s)		n/a		n/a		Child Inputs		PIC SDI12 Ultra	SDI12 Ultra Primary	addr=0;pos=0;mc=M;stab=0	logs every 15 minute(s)	n/a	n/a	Child Inputs					
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<p>10 Click on "Child Inputs" to show the below list of inputs:</p> <ul style="list-style-type: none"> <li>• SDI12 Ultra 0</li> <li>• SDI12 Ultra 1</li> <li>• SDI12 Ultra 2</li> <li>• SDI12 Ultra 3</li> <li>• SDI12 Ultra 4</li> </ul>	 <table border="1"> <thead> <tr> <th colspan="5">SDI12 Ultra Primary</th> </tr> </thead> <tbody> <tr> <td>SDI12 Ultra 0</td> <td>Channel: 0</td> <td>n/a</td> <td>0 alarm(s)</td> <td>3027.59</td> </tr> <tr> <td>SDI12 Ultra 1</td> <td>Channel: 1</td> <td>n/a</td> <td>0 alarm(s)</td> <td>25.1</td> </tr> <tr> <td>SDI12 Ultra 2</td> <td>Channel: 2</td> <td>n/a</td> <td>0 alarm(s)</td> <td>0</td> </tr> <tr> <td>SDI12 Ultra 3</td> <td>Channel: 3</td> <td>n/a</td> <td>0 alarm(s)</td> <td>151</td> </tr> <tr> <td>SDI12 Ultra 4</td> <td>Channel: 4</td> <td>n/a</td> <td>0 alarm(s)</td> <td>17.32</td> </tr> </tbody> </table>	SDI12 Ultra Primary					SDI12 Ultra 0	Channel: 0	n/a	0 alarm(s)	3027.59	SDI12 Ultra 1	Channel: 1	n/a	0 alarm(s)	25.1	SDI12 Ultra 2	Channel: 2	n/a	0 alarm(s)	0	SDI12 Ultra 3	Channel: 3	n/a	0 alarm(s)	151	SDI12 Ultra 4	Channel: 4	n/a	0 alarm(s)	17.32
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<p>11</p> <ul style="list-style-type: none"> <li>• Click on each item under the "SDI12 Ultra Primary" (the first column) to change the name of each child input</li> <li>• The definition of each item is shown on the right</li> </ul>	 <p><b>SDI12 Ultra 0 - VW_1_Hz</b></p> <p>Input Settings   Calibration   Logging Frequency   Alarms   Data</p> <p>Input Name: <b>SDI12 Ultra 0 - VW_1_Hz</b></p> <p>SCADA Tag ID: <input type="text"/></p> <p>Save Cancel</p> <ul style="list-style-type: none"> <li>- SDI12 Ultra 0 -&gt; VW_1_Hz -&gt; channel 1 VW frequency reading in Hz</li> <li>- SDI12 Ultra 1 -&gt; VW_1_DegC -&gt; channel 1 VW temperature reading in Degree C</li> <li>- SDI12 Ultra 2 -&gt; VW_2_Hz -&gt; channel 2 VW frequency reading in Hz</li> <li>- SDI12 Ultra 3 -&gt; VW_2_DegC -&gt; channel 2 VW temperature reading in Degree C</li> <li>- SDI12 Ultra 4 -&gt; VWstalker PCB temperature reading in Degree C</li> </ul>																														
<p>12 If readings are available, the latest readings will be shown in the last column</p>	 <table border="1"> <thead> <tr> <th colspan="5">SDI12 Ultra Primary</th> </tr> </thead> <tbody> <tr> <td>SDI12 Ultra 0 - VW_1_Hz</td> <td>Channel: 0</td> <td>n/a</td> <td>0 alarm(s)</td> <td>3027.59</td> </tr> <tr> <td>SDI12 Ultra 1 - VW_1_DegC</td> <td>Channel: 1</td> <td>n/a</td> <td>0 alarm(s)</td> <td>25.1</td> </tr> <tr> <td>SDI12 Ultra 2 - VW_2_Hz</td> <td>Channel: 2</td> <td>n/a</td> <td>0 alarm(s)</td> <td>0</td> </tr> <tr> <td>SDI12 Ultra 3 - VW_2_DegC</td> <td>Channel: 3</td> <td>n/a</td> <td>0 alarm(s)</td> <td>151</td> </tr> <tr> <td>SDI12 Ultra 4 - PCB DegC</td> <td>Channel: 4</td> <td>n/a</td> <td>0 alarm(s)</td> <td>17.32</td> </tr> </tbody> </table>	SDI12 Ultra Primary					SDI12 Ultra 0 - VW_1_Hz	Channel: 0	n/a	0 alarm(s)	3027.59	SDI12 Ultra 1 - VW_1_DegC	Channel: 1	n/a	0 alarm(s)	25.1	SDI12 Ultra 2 - VW_2_Hz	Channel: 2	n/a	0 alarm(s)	0	SDI12 Ultra 3 - VW_2_DegC	Channel: 3	n/a	0 alarm(s)	151	SDI12 Ultra 4 - PCB DegC	Channel: 4	n/a	0 alarm(s)	17.32
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13 Click on the reading value to show the chart of readings vs time for the last 24 hours

Input Settings - op21561 - SDI12 Ultra 0 - VW\_1\_Hz - Mozilla Firefox

https://www.outpostcentral.com/remote/(S(svv3qk0y0kontvzoba1l34p))/InputSettingTab.aspx?InputID=942074&tab=4&pid=0.5526556

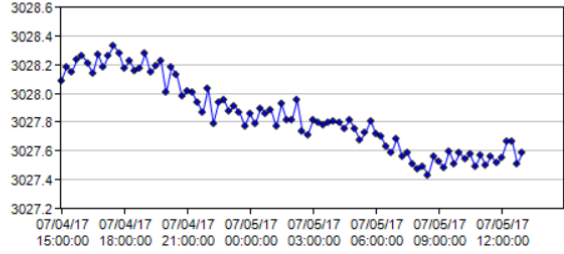
**SDI12 Ultra 0 - VW\_1\_Hz**

Input Settings | Calibration | Logging Frequency | Alarms | **Data**

- Import Data...
- Export Data
- Delete Data

89/89 row(s) returned.

Datetime	Value
5/07/2017 1:00:10 p.m.	3027.586
5/07/2017 12:45:10 p.m.	3027.509
5/07/2017 12:30:10 p.m.	3027.668
5/07/2017 12:15:10 p.m.	3027.66
5/07/2017 12:00:10 p.m.	3027.552
5/07/2017 11:45:10 a.m.	3027.513
5/07/2017 11:30:10 a.m.	3027.563
5/07/2017 11:15:10 a.m.	3027.497
5/07/2017 11:00:10 a.m.	3027.571
5/07/2017 10:45:10 a.m.	3027.486
5/07/2017 10:30:10 a.m.	3027.575
5/07/2017 10:15:10 a.m.	3027.544
5/07/2017 10:00:10 a.m.	3027.583
5/07/2017 9:45:10 a.m.	3027.509
5/07/2017 9:30:10 a.m.	3027.598
5/07/2017 9:15:10 a.m.	3027.478



From: 04/Jul/2017 14:57:24 To: 05/Jul/2017 14:57:24 Refresh

Tip: always export your original data before editing, deleting or importing with overwrite.

14

- Repeat steps 2 to 12 to add one more VWstalker to the current WASP, ensuring the address is unique to each VWstalker
- Up to 2 VWstalkers can be added to one WASP without the need for external power supply.



## 9 Additional Notes:

### Alarms

Alert messages may be sent via SMS or email if a reading satisfies a given condition.

To add an alarm, click the “Add” button, from the Alarm Type drop down list, select an option (“High/Low” is the most common for geotechnical and structural applications since you may be notified if readings are either above or below a predetermined value).

Click “Next”.

#### ❖ **Reset Type – Time**

If this option is selected, the WASP will call in at the regularly scheduled time.

As soon as the regularly scheduled upload is completed and the condition met, an email or SMS will be sent to the preconfigured recipients.

Time based selection is used to prevent alarm from being sent repeatedly.

#### ❖ **Reset Type – Value (beta) \***

This option is not available for WASP-VW systems

#### ❖ **Recipient List**

A recipient can only be added from the “GROUP” tab, within the “Alarm Roster” tab.

#### ❖ **SMS Recipients**

If SMS delivery is used ensure the number includes the country code, i.e. in the USA, a “1” must be present in front of any US phone number. e.g. 16467707602

Once all fields are completed as desired, click the “Finish” (or “Update” if making changes to an existing alarm) button.

A screen shot showing an example of an Alarm configuration is shown below:

**STK (T)**

Input Settings Calibration Logging Frequency **Alarms** Data

**High/Low Alarm Conditions & Recipients**

Condition: Send alarm if STK (T) measures **above** **2000** **%** unit **(not a rate)** in a single logging interval.

Reset Type: **Time**

Do not send again for **12 hours**

Recipient List: **--- Not Selected ---** [Manage Lists](#)

SMS Recipients:  (Comma separated list. Numbers require country code)

Email Recipients:  (Comma separated list)

Alarm Message:

Disabled:

## Data

Data may be imported, exported, deleted or edited. Data values shown in the columns on the left correspond to the values shown in the graph to the right. If no data is visible (or you would like to configure which data is shown), you will need to change the From/To time period below the graph by either using the calendar after clicking on the date or by using the arrows below the dates.

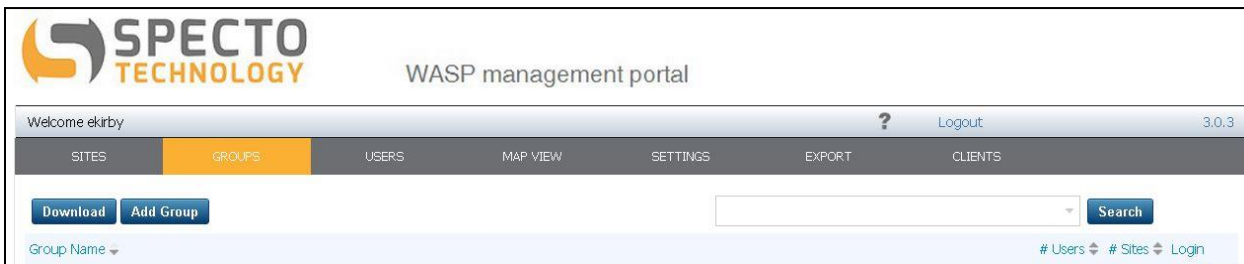
To edit data values, click on the value to be edited and type in the new value. Be aware that this is a permanent change of data and is not recommended unless you are sure the change is required. Only clients with administrator access may delete or edit data.

## APPENDICES

### APPENDIX A: Configuration Site (Additional Information)

#### A. “GROUPS” Tab

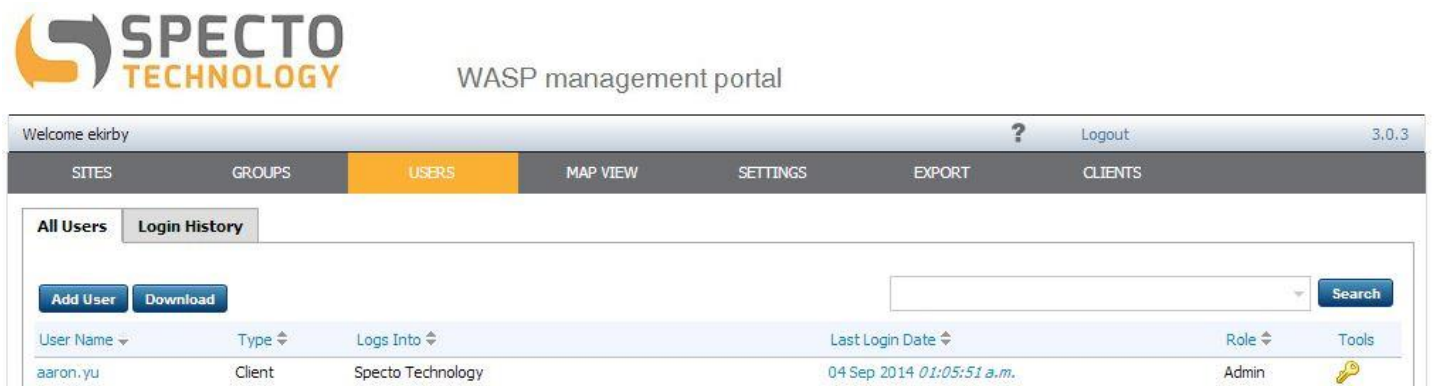
Groups may be created to manage access to more than one user for the data presentation area of the website. The following screen shot shows the view after clicking the “GROUPS” tab.



Once a group is added by entering a “New Group Name”, users may select which WASPs (Sites) will be visible to the group.

#### B. “USERS” Tab

Users may be created to allow others access to WASP data and settings. The following screen shot shows the view after clicking the “USERS” tab.



Users may be one of 4 types (Site, Group, Client or Custom).

- **Site** – a user may access a single WASP (site).
- **Group** – a user may view data for a predefined group of WASPs (sites).
- **Client** – a user may access all WASPs (sites) assigned to your account.

Users may be one of two Roles (User or Admin).

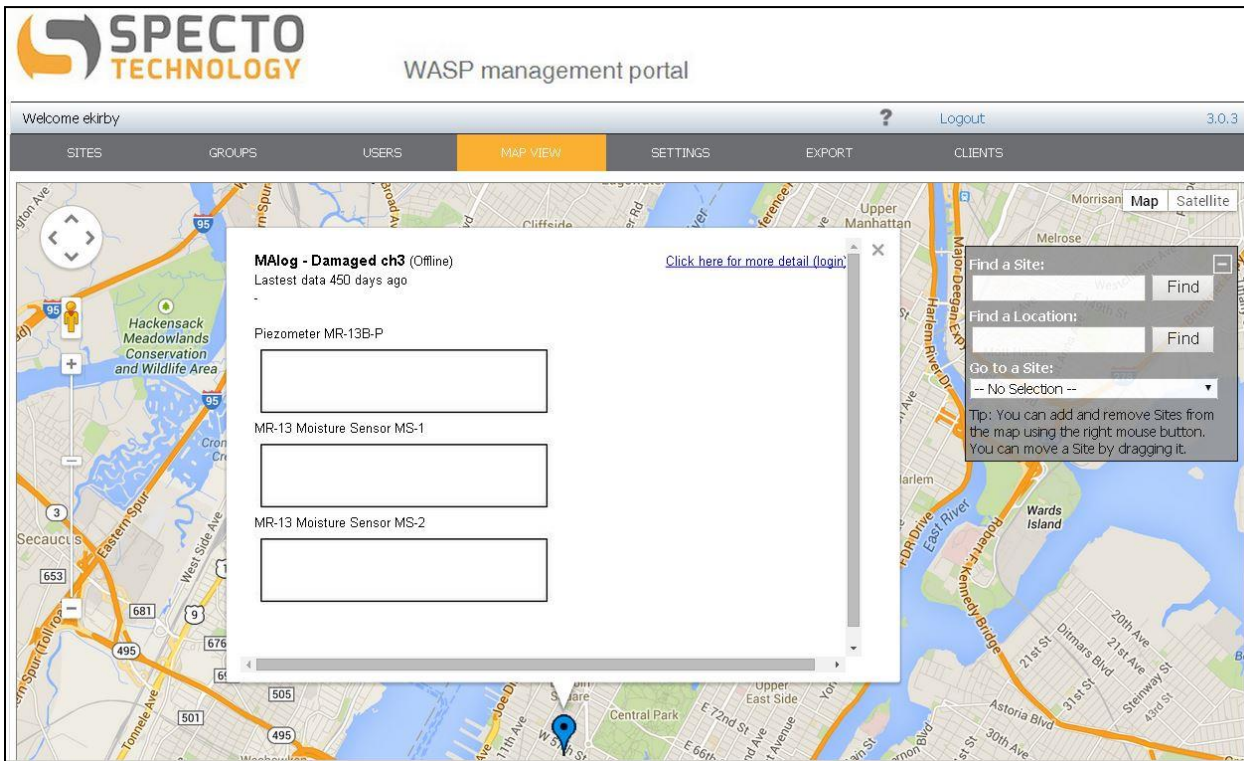
- **User** – may view but not edit features, depending on the Type.
- **Admin** – may edit configuration features, depending on the Type.

You may also view login statistics of each user to see each user’s activity on the website. The below table shows access levels for each account type and role.

		Configuration Page		Graph Page	
		View	Edit	View	Edit
Site	User			•	
	Admin	•	•	•	•
Group	User			•	
	Admin			•	•
Client	User	•		•	
	Admin	•	•	•	•

### C. “MAP VIEW” Tab

The following screen shot shows the view after clicking the “MAP VIEW” tab.



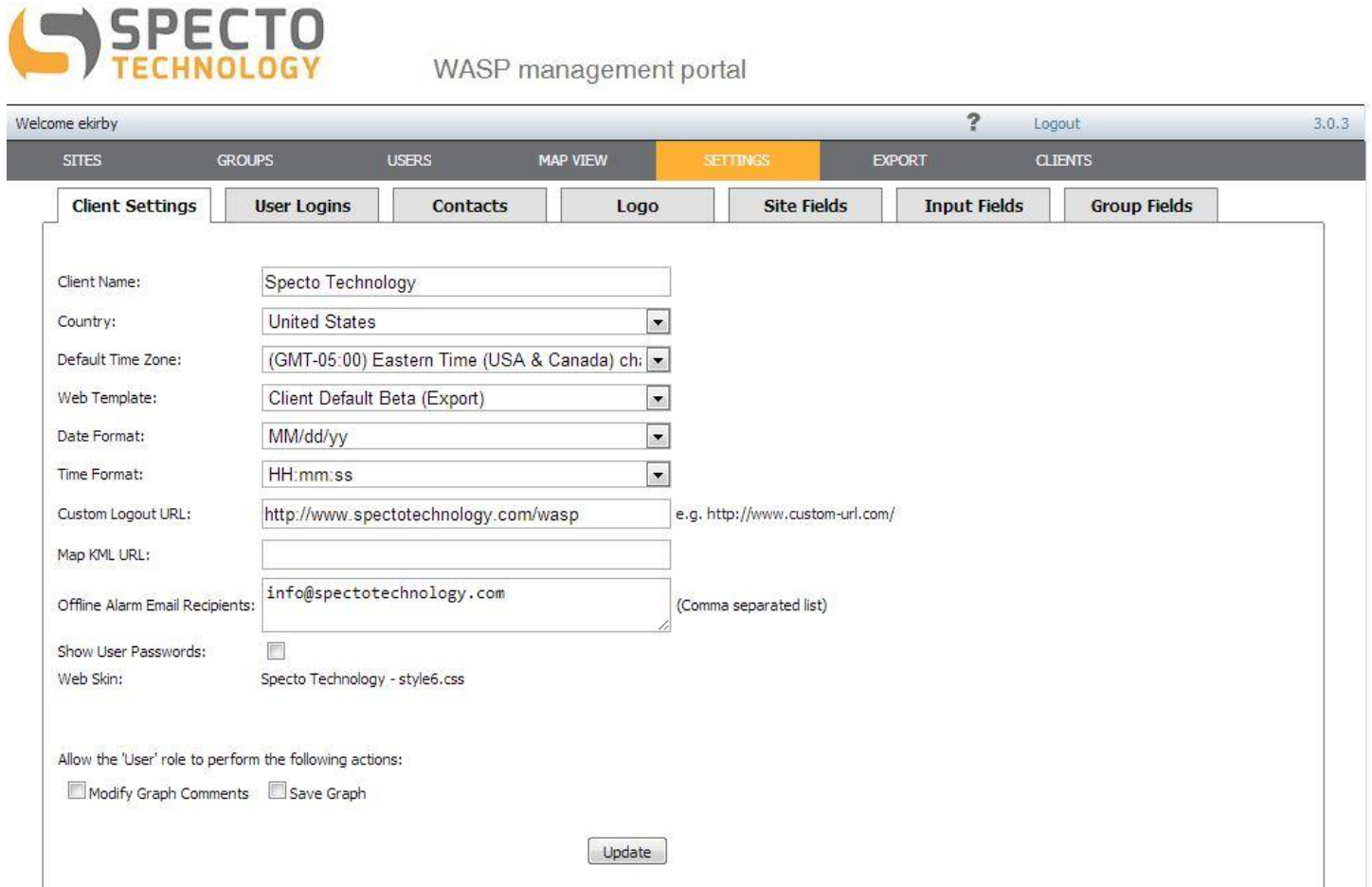
Right click on the map to add a WASP (site).

To move a WASP (site) that is already on the map, simply drag and drop it to a new location using your left mouse button.

You may go directly to a particular WASP (site) by selecting it from the drop down list, in the top right corner.

#### D. “SETTINGS” Tab

General account settings may be adjusted here, including location, time zone and date/time format. A list of email addresses may be entered to alert users when WASPs are offline. The following screen shot shows the view after clicking the “SETTINGS” tab.



The screenshot displays the SPECTO TECHNOLOGY WASP management portal. The page title is "WASP management portal". The user is logged in as "ekirby". The navigation menu includes SITES, GROUPS, USERS, MAP VIEW, SETTINGS (highlighted), EXPORT, and CLIENTS. The "Client Settings" sub-tab is active, showing the following configuration options:

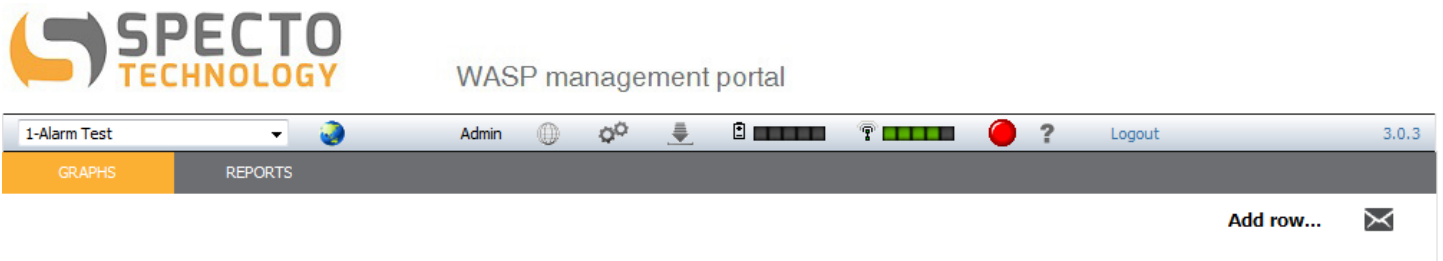
- Client Name: Specto Technology
- Country: United States
- Default Time Zone: (GMT-05:00) Eastern Time (USA & Canada) ch.
- Web Template: Client Default Beta (Export)
- Date Format: MM/dd/yy
- Time Format: HH:mm:ss
- Custom Logout URL: http://www.spectotechnology.com/wasp (e.g. http://www.custom-url.com/)
- Map KML URL: (empty)
- Offline Alarm Email Recipients: info@spectotechnology.com (Comma separated list)
- Show User Passwords:
- Web Skin: Specto Technology - style6.css

Permissions for the 'User' role are also shown:









- Allow the 'User' role to perform the following actions:
  - Modify Graph Comments
  - Save Graph

An "Update" button is located at the bottom of the settings form.



## APPENDIX B: Data Display Site



You may access the various functions of the Data Display site by clicking on the menu items across the top of the page. Details of each link are given below:  
A drop down list shows all WASPs available to a user. Selecting a WASP will bring up the pre-defined plots for that logger.

-  Clicking the Map icon opens a new window with a Google Map, the user may select a WASP to view data.
-  Clicking the Site Configuration icon opens a new window that allows a user to view/change the general WASP settings.
-  Clicking the Sensor Configuration icon opens a new window that allows a user to view/change the sensor settings for the WASP.
-  Clicking the Download Data icon opens a new window that allows a user to download data from any of the WASP input in .csv or text format.
-  Clicking the Battery Bar icon opens a new window that allows a user to view the WASP battery levels for the past week (please note, the icon bars do not change color according to battery level).
-  Clicking the Signal Bar icon opens a new window that allows a user to view the WASP signal levels for the past week.
-  Clicking the WASP Status icon opens a window showing log of recent functions performed by the WASP.
-  Clicking the question mark icon opens a new tab containing an interactive Help menu.

Details of each Tab are given below:

-  – The Graphs tab shows the predefined plots and data statistics for the WASP you are viewing.
-  - The Reports tab shows the predefined reports for the WASP.

See example screen shot of a Data Display Site below.



## A. “GRAPHS” Tab



Customized graphs showing sensor data may be viewed and configured here (depending on the user’s access level).

Clicking on the Image icon allows users to set an image to be associated with a graph.

Clicking on the graph allows users to configure graphs by adding data series, customizing the Facts & Figures, etc. any change made to a graph must be saved by clicking the disk icon below the graph. Once the disk icon is clicked, you may determine the duration of data that is shown.

New graphs may be added by clicking the “Add row...” link. Page and graph layout may be edited by clicking on the cog icon (⚙️).

Utilizing the Help feature of the website will assist with further details.

## B. “REPORTS” Tab



Customized reports showing sensor data may be viewed and configured here (depending on the user’s access level).

A new report may be created by clicking the “Add Report” link, in the top right corner of the page. To edit an existing report, click on the report and configure the desired details shown in the window that subsequently opens. Reports may be automatically generated and emailed to a predetermined list of recipients, as desired.

## APPENDIX C: Battery Life

The battery life of the WASP-VW is dependent on the following factors:

- Strength of cellular signal
- Ambient temperature
- Sensor stabilization time - how long the sensor must be powered up before taking a reading
- Frequency of reading
- Frequency of data upload

The expected battery life for the two variants of the WASP-VW is as follows:

- WASP-3G-2VW = 2 years (1 x VWstalker connected)
- WASP-3G-4VW = 1 year (2 x VWstalkers connected)



## **APPENDIX D: VWstalker Programmer User Guide**