

# WSDA<sup>®</sup>-1000 Control Panel



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**ISSUED: 7 May 2012**

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**WSDA<sup>®</sup>-1000 firmware**

This manual is designed for use with MicroStrain's WSDA<sup>®</sup>-1000 firmware version 2.0.17.

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## Overview

The WSDA<sup>®</sup>-1000 Control Panel is a web-based interface to the [WSDA<sup>®</sup>-1000 Wireless Sensor Data Aggregator](#). All web browsers are acceptable with Firefox and Chrome providing the best results. The Control Panel is reached by logging in to the WSDA<sup>®</sup>-1000 through an Internet browser. The web-based interface is served from the WSDA<sup>®</sup>-1000 itself and allows the user to configure, reboot, troubleshoot, change password, and perform several other functions related to the WSDA<sup>®</sup>-1000, the wireless nodes it serves and [SensorCloud<sup>™</sup>](#).

About this WSDA	
System Name	FFFF0015C91C8D00
Serial Number	FFFF0015C91C8D00
MAC Address	00:15:C9:1C:8D:10
Model Number	WSDA-ETH
OS Version	2.0.17
<hr/>	
System Time	2011-07-06 22:59 UTC
System Uptime	23 hours
System Resets	19
Memory Utilization	90 MB/124 MB
Flash Card Utilization	81 MB/1.8 GB
Connection Type	DHCP
IP Address	192.168.167.29
Total Data Sent	58486732 bytes

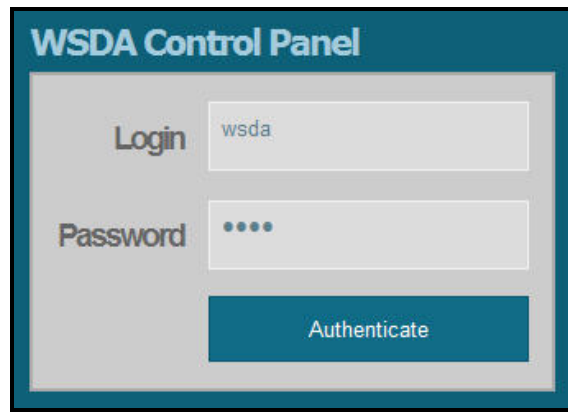
*Figure 1. WSDA<sup>®</sup>-1000 Control Panel Main screen*

- The **Main** screen offers a menu that allows navigation to the three sections of the Control Panel and Logout.
- The **General** section provides information about the WSDA<sup>®</sup>-1000 identity, the wireless nodes it serves, and its current time settings. These are informational only and no user settings may be made in this section.
- The **Data** section allows the user to actively set which nodes and channels are transmitted to the SensorCloud<sup>™</sup>, and to clear the data from the WSDA<sup>®</sup>-1000 internal memory.
- The **Tools** section allows the user to actively troubleshoot the WSDA<sup>®</sup>-1000, configure its mode, system time, beaconing state, radio frequency, etc., reboot the WSDA<sup>®</sup>-1000, update its operating system software and change the user's password.
- The **Logout** allows the user to log out of the WSDA<sup>®</sup>-1000 and return it to normal operation.

## Login

Typically the user will navigate to the WSDA<sup>®</sup>-1000 Control Panel Login screen by clicking the View button in Live Connect, as explained in the [WSDA<sup>®</sup>-1000 Quick Start Guide](#). Alternatively, the user may type the WSDA<sup>®</sup>-1000 URL into their browser and navigate to the Login.

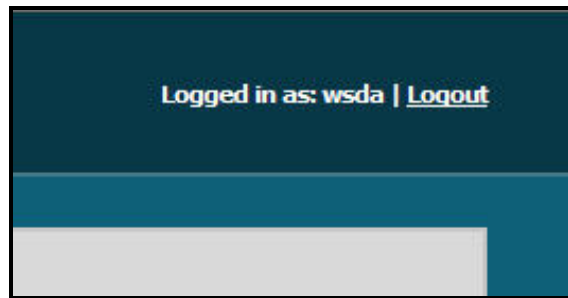
1. Enter your WSDA<sup>®</sup>-1000 Control Panel login credentials, as shown in Figure 2.
2. The factory default credentials are:
  - Login: wsda
  - Password: wsda
3. Click the Authenticate button.
4. The WSDA<sup>®</sup>-1000 Control Panel Main screen will appear.



*Figure 2. WSDA<sup>®</sup>-1000 Control Panel Login*

## Logout

1. Click Logout in upper right hand corner of the WSDA<sup>®</sup>-1000 Control Panel as shown in Figure 3.
2. The Logout will occur and you will be returned to the Login screen.



*Figure 3. WSDA<sup>®</sup>-1000 Control Panel Logout*

## General

The **General** section provides information about the WSDA<sup>®</sup>-1000 identity, the wireless nodes it serves, and its current time settings. These are informational only and no user settings may be made in this section.

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### About

#### System Name

*Example: My WSDA*

A human readable ‘alias’ given to the WSDA<sup>®</sup>-1000 so that it is more easily recognized. By default, the System Name is the same as the Serial Number. The System Name can be set by the user in the Configuration menu.

#### Serial Number

*Example: FFFF0123456789AB*

An alpha-numeric identifier embedded in the WSDA<sup>®</sup>-1000 hardware. The Serial Number is set at the factory.

#### MAC Address

*Example: FF:FF:FF:FF:FF:FF*

An alpha-numeric identifier embedded in the network card in the WSDA<sup>®</sup>-1000 hardware. A Media Access Control Address is a unique identifier assigned to network interfaces for communications on the physical network segment. The MAC Address is set at the factory.

#### Model Number

*Example: WSDA<sup>®</sup>-1000*

An alpha-numeric identifier used to identify the WSDA<sup>®</sup> type. Several types exist including the WSDA<sup>®</sup>-1000 (WSDA<sup>®</sup> in standard enclosure with Ethernet interface), WSDA<sup>®</sup>-MIL (WSDA<sup>®</sup> hardened for military applications), etc. The Model Number is set at the factory.

#### OS Version

*Example: 2.0.17*

A numeric identifier used to identify the WSDA<sup>®</sup>-1000 Operating System version. The Operating System is the on-board software that operates the WSDA<sup>®</sup>-1000. WSDA<sup>®</sup>-1000 are shipped with the current OS version. From time to time, MicroStrain makes available OS updates. These updates can be installed by the user through the OS Update menu which in turn will modify the OS Version identifier.

## **System Time**

*Example: 2011-07-07 15:40 UTC*

The current UTC time on-board the WSDA<sup>®</sup>-1000 System Clock. UTC or [Coordinated Universal Time](#) is the time standard by which the world regulates clocks and time. The System Clock is normally updated from Internet time servers every 12 hours if the WSDA<sup>®</sup>-1000 has access to the Internet through its Ethernet connection. Please see *WSDA<sup>®</sup>-1000 Clocks* elsewhere in this guide for a more detailed discussion of the System and Real Time Clocks.

## **System Uptime**

*Example: 20 hours*

The elapsed time since the WSDA<sup>®</sup>-1000 was powered on and booted up. The System Uptime will be zeroed when the WSDA<sup>®</sup>-1000 power is cycled, power is lost and re-started, or the WSDA<sup>®</sup>-1000 is rebooted using the Reboot menu in the Tools section.

## **System Resets**

*Example: 32*

The number of times the WSDA<sup>®</sup>-1000 has been reset. The System Resets will be incremented when the WSDA<sup>®</sup>-1000 power is cycled, power is lost and re-started, or the WSDA<sup>®</sup>-1000 is rebooted using the Reboot menu in the Tools section. The System Resets is written to non-volatile memory and survives any power events.

## **Memory Utilization**

*Example: 82 MB/124 MB*

The amount of active memory (RAM) currently in use by the WSDA<sup>®</sup>-1000. The usage will change as data from wireless nodes is being received, data is being forwarded to SensorCloud<sup>™</sup>, etc.

## **Flash Card Utilization**

*Example: 44 MB/1.8 GB*

The amount of memory currently consumed by data on the WSDA<sup>®</sup>-1000 flash card. The usage will change as data from wireless nodes is being received, or if the data is erased using the Clear Data menu in the Data section. The flash card has a capacity of 1.8 GB of data. When capacity is reached, the flash card will begin dumping data on a FIFO basis. i.e., the oldest data will be dumped and the newest data will be stored.

## Connection Type

*Example: DHCP*

The type of Ethernet connection the WSDA<sup>®</sup>-1000 uses. DHCP or [Dynamic Host Configuration Protocol](#) is an automatic configuration protocol used on IP networks. Computers that are connected to IP networks must be configured before they can communicate with other computers on the network. DHCP allows a computer to be configured automatically, eliminating the need for intervention by a network administrator. WSDA<sup>®</sup>-1000 currently only uses DHCP.

## IP Address

*Example: 127.0.0.1*

The IP Address assigned to the WSDA<sup>®</sup>-1000 by the user's network. IP Address or [Internet Protocol Address](#) is a numerical label assigned to each device (e.g., computer, printer, and in this case, WSDA<sup>®</sup>-1000) participating in a computer network that uses the [Internet Protocol](#) for communication.

## Total Data Sent

*Example: 17077878 bytes*

The total amount of data sent over the network connection since the WSDA<sup>®</sup>-1000 was powered on and booted up. This includes data uploaded to SensorCloud<sup>™</sup>, time server synchronization, UPnP data, serving the WSDA<sup>®</sup>-1000 Control Panel, Live Connect data, etc. The Total Data Sent will be zeroed when the WSDA<sup>®</sup>-1000 power is cycled, power is lost and re-started, or the WSDA<sup>®</sup>-1000 is rebooted using the Reboot menu in the Tools section.

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## Node List

*Example:*

<i>Address</i>	<i>Channels</i>	<i>Last Timestamp</i>	<i>Relative Timestamp</i>
20	ch1,rssi	07/07/11 18:38	11 minutes
58	Ch1,ch7,rssi	07/07/11 16:41	2.0 hours
54	Ch1,ch2,ch3	6/30/11 22:07	6 days

**Table 1.** Node List

The Node List displays all the wireless nodes that have data currently stored on the flash card. The node's address is shown along with the channels of data that are recorded, the relative timestamp (time since the node sent its first data to the WSDA<sup>®</sup>-1000), and the last timestamp (the timestamp of the most recent node data received by the WSDA<sup>®</sup>-1000).

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## **Time Settings**

### **System Time**

*Example: 2011-07-07 19:28:30 UTC*

The current UTC time on-board the WSDA<sup>®</sup>-1000 System Clock. UTC or [Coordinated Universal Time](#) is the time standard by which the world regulates clocks and time. The System Clock is normally updated from Internet time servers every 12 hours if the WSDA<sup>®</sup>-1000 has access to the Internet through its Ethernet connection. Please see *WSDA<sup>®</sup>-1000 Clocks* elsewhere in this guide for a more detailed discussion of the System and Real Time Clocks.

### **Update Interval**

*Example: Every 12 hours*

The System Clock and the Real Time Clock (RTC) are normally updated from Internet time servers every 12 hours if the WSDA<sup>®</sup>-1000 has access to the Internet through its Ethernet connection. This interval is fixed in the OS and is not user settable. Please see *WSDA<sup>®</sup>-1000 Clocks* elsewhere in this guide for a more detailed discussion of the System and Real Time Clocks.

### **System Time Source**

*Example: Ethernet*

The System Clock is normally updated from Internet time servers every 12 hours if the WSDA<sup>®</sup>-1000 has access to the Internet through its Ethernet connection. Please see *WSDA<sup>®</sup>-1000 Clocks* elsewhere in this guide for a more detailed discussion of the System and Real Time Clocks.

### **System Time Last Sync**

*Example: 2011-07-07 11:15:07(8hours ago)*

The last time the System Clock was updated by its System Time Source. The time is reported as UTC.

### **Internal RTC Source**

*Example: Ethernet*

The Real Time Clock (RTC) is normally updated from Internet time servers every 12 hours if the WSDA<sup>®</sup>-1000 has access to the Internet through its Ethernet connection. Please see *WSDA<sup>®</sup>-1000 Clocks* elsewhere in this guide for a more detailed discussion of the System and Real Time Clocks.

### **Internal RTC Last Sync**

*Example: 2011-07-07 11:15:07(8hours ago)*

The last time the Real Time Clock (RTC) was updated by its Internal RTC Source. The time is reported as UTC.

## Data

The **Data** section allows the user to actively set which nodes and channels are transmitted to the SensorCloud™, and to clear the data from the WSDA®-1000 internal memory.

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### **Upload Filter**

By default, the WSDA®-1000 transmits all node data stored on the flash card to the SensorCloud™. The Upload Filter function allows the user to filter which node data is to be transmitted to the SensorCloud™. Users may elect to transmit **all** data received from a wireless node, **exclude** some data from a wireless node, conversely **include** some data from a wireless node, or transmit **no** data for that particular node. Setting this ‘filter’ can be performed in advance of the wireless node data being received or after the fact. If data has already been received, consulting the Node List is recommended. To be clear: if the user does not apply any filter to a particular node, all data will be transmitted to the SensorCloud™.

**Example:** If the user wanted to **exclude all** data received from node (with address) 206, these steps would be followed:

1. Enter 206 in the Address box.
2. Enter ‘all’ or ‘ALL’ or ‘\*’ in the Channel List box.
3. Click the Add button and the filter will be added.
4. Select the Do Not Upload the Listed Channels radio button.
5. Click Change Filter Type button.

**Example:** If the user wanted to **include** just channel 1, channel 3 and rssi received from node 209, these steps would be followed:

1. Enter 209 in the Address box.
2. Enter ‘ch1,ch3,rssi’ or ‘ch1 ch3 rssi’ or ‘CH1 CH3 RSSI’ in the Channel List box.
3. Click the Add button and the filter will be added.
4. Select the Only Upload the Listed Channels radio button.
5. Click Change Filter Type button.

**Example:** If the user wanted to **exclude** channel 4 and channel 6 received from node 206, these steps would be followed:

1. Enter 213 in the Address box.
2. Enter ‘ch4,ch6’ or ‘ch4 ch6’ or ‘CH4,CH6’ in the Channel List box.
3. Click the Add button and the filter will be added.
4. Select the Do Not Upload the Listed Channels radio button.
5. Click Change Filter Type button.

**Important Note:** The Change Filter Type function affects all nodes in the filter list; when applied, it sets all nodes in the filter list. It can not be used to set each individual node.

- The Update button allows the user to modify the Channel List of any individual node.
- The Delete button allows the user to delete the filter of any individual node.
- The Clear All button allows the user to delete all node filters.

Address	Channel List	Update	Delete
206	*	Update	Delete
209	ch1, ch3, rssi	Update	Delete
213	CH4, CH6	Update	Delete
		Add	
Clear All			

*Figure 4. Upload Filter window*

### **Download Data**

The Download Data function, in this version of firmware, is for factory administration only and should not be run by the user. It has no current function in the field.

### **Clear Data**

The Clear Data function allows the user to erase all wireless node data from the flash card. Before erasing, the user should confirm that all data has been transmitted to the SensorCloud™ by viewing the Node List. The Current Data Size display indicates the amount of data currently stored on the flash card.

1. Click the Clear All Data button and the data will be erased.

Clear WSDA Data

Current Data Size    24 KB    Clear All Data

*Figure 5. Clear Data window*

## Tools

The **Tools** section allows the user to actively troubleshoot the WSDA<sup>®</sup>-1000, configure its mode, system time, beaconing state, radio frequency, etc., reboot the WSDA<sup>®</sup>-1000, update its operating system software and change the user's password.

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## Diagnostics

The Diagnostics function allows the user to test the operation of the WEB LED and the WSDA LED on the front panel of the WSDA<sup>®</sup>-1000 and their respective interoperation with the WSDA<sup>®</sup>-1000 Operating System (OS). Both tests operate the same way; our example below is for the WEB LED.

1. Click the dropdown box to the right of the WEB LED and select Transmit.
2. Click the Submit button and the WEB LED will begin continuously flashing **blue**.
3. Click the dropdown box to the right of the WEB LED and select OK.
4. Click the Submit button and the WEB LED will illuminate solid **green**.
5. Click the dropdown box to the right of the WEB LED and select Problem.
6. Click the Submit button and the WEB LED will illuminate solid **red**.

**Important Note:** After testing, the WEB LED and the WSDA LED will automatically revert to control by the OS.

## Configuration

The Configuration function allows the user to set a number of parameters associated with WSDA<sup>®</sup>-1000 operation.

### Device Name

*Default: FFFF0123456789AB(serial number)*

The Device Name function allows the user to change the human-readable alias of the WSDA<sup>®</sup>-1000 so that it is more easily recognized.

1. Enter new name in the Device Name box.
2. Click the Update Device Name button.

### WSDA Mode

*Default: Aggregate Data*

The WSDA Mode function allows the user to change the WSDA<sup>®</sup>-1000 operational mode to either Aggregate Data or Live Connect. In Aggregate Data mode, the WSDA<sup>®</sup>-1000 receives data from wireless nodes and transmits the data on to SensorCloud<sup>™</sup>. In Live Connect mode, the WSDA<sup>®</sup>-1000 will be idled, awaiting communication with and operation by Node Commander<sup>®</sup> software.

1. Select the Aggregate Data or Live Connect radio button.
2. Click the Update WSDA Mode button.

## SensorCloud Upload

*Default: Enabled*

The SensorCloud Upload function allows the user to enable or disable transmission of data on the flash card to SensorCloud™.

1. Select the Enabled or Disabled radio button.
2. Click the Set SensorCloud Mode button.

## WSN Beacon State

*Default: Off*

The WSN (Wireless Sensors Network) Beacon State function allows the user to enable or disable the time synchronization beacon emitted by the WSDA®-1000 to the wireless nodes it is servicing.

1. Select On or Off in the WSN Beacon State dropdown.
2. Click the Set Beacon State button.

## RF Channel

*Default: 25*

The RF Channel function allows the user to set the radio channel that the WSDA®-1000 operates on. The wireless nodes that the WSDA®-1000 is servicing must be set to the same radio channel.

1. Select a channel (from 11 to 26) in the RF Channel dropdown.
2. Click the Set RF Channel.

## Use Secure HTTP

*Default: Unsecure*

The Use Secure HTTP function allows the user to enable or disable secure communications between the WSDA®-1000 and the user's host computer. This means that communications between the WSDA®-1000 and the user host computer will be encrypted, allowing a more secure local environment. To be clear: transmissions between the WSDA®-1000 and the SensorCloud™ are always encrypted and secure.

1. Check (for secure) or uncheck (unsecure) the Use Secure HTTP checkbox.
2. Click the Set HTTP Type.
3. Reboot the WSDA®-1000 using the Reboot function in the Tools section.

## System Time (UTC)

*Default: Current System Time*

The System Time (UTC) function allows the user to set the System Time. This function is normally used when no other time source (GPS, Ethernet, etc.) is available.

1. Enter MM-DD-YYYY HH:MM:SS in the System Time (UTC) boxes.
2. Click the Set System Time.

## Reboot WSDA

The Reboot WSDA function allows the user to restart and reinitialize the WSDA<sup>®</sup>-1000 without cycling the power.

1. Click the Reboot WSDA button.
2. The WSDA<sup>®</sup>-1000 will commence its 3 stage boot-up process as described in figure and table below. This will take between 2 and 3 minutes.
3. A new Login will now be required.



*Figure 6. WSDA Face Plate*

Stage	Web LED	WSDA LED	Power LED
1. Initial Power On	Red	Red	Green
2. Booting Up	Red	Blinking Blue	Green
3. Fully Booted	Green	Green	Green

*Table 2. WSDA<sup>®</sup>-1000 LED Key*

## OS Update

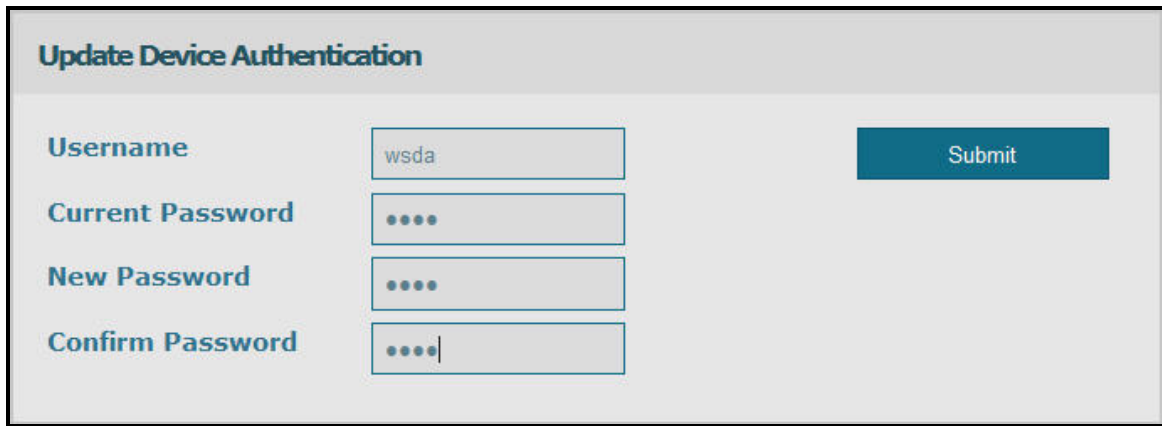
The OS Update function allows the user to update the Operating System software on the WSDA<sup>®</sup>-1000.

1. Click the Choose File button.
2. The Open window will appear.
3. Navigate to the update file provided by MicroStrain. As an example, the file will have a name and extension similar to: *firmware\_v2.0.17.wda\_os*.
4. Click Open.
5. The Choose File button will change its label to Uploading and grey out.
6. Please wait and after several moments, the update will complete.

## ***Change Password***

The Change Password function allows the user to change the Username and the Password. By default, the Username = wsda and the Password = wsda.

1. Enter new name in Username box.
2. Enter current password in Current Password box.
3. Enter new password in New Password box.
4. Enter new password in Confirm Password box.
5. Click Submit button.



The screenshot shows a window titled "Update Device Authentication". It contains four input fields and a submit button. The "Username" field contains the text "wsda". The "Current Password", "New Password", and "Confirm Password" fields are masked with four dots. The "Confirm Password" field has a cursor at the end. A blue "Submit" button is located to the right of the input fields.

<b>Username</b>	<input type="text" value="wsda"/>	<input type="submit" value="Submit"/>
<b>Current Password</b>	<input type="password" value="...."/>	
<b>New Password</b>	<input type="password" value="...."/>	
<b>Confirm Password</b>	<input type="password" value="...."/>	

*Figure 7. Change Password window*

## **Further Topics**

### ***WSDA<sup>®</sup>-1000 Clocks***

The WSDA<sup>®</sup>-1000 has two on-board clocks, the System Clock and the Real Time Clock (RTC). The purpose of the System Clock is to provide the Operating System with a time source. The purpose of the Real Time Clock is 1) to provide time updates to the System Clock in the event that the System Clock can not receive time updates from GPS or Ethernet sources, and 2) to provide the beaconing function of the WSDA<sup>®</sup>-1000 with its timing source.

During normal operation, the System Clock and the Real Time Clock receive a synchronized time update from a common time source every 12 hours in this order. If the WSDA<sup>®</sup>-1000 is connected to GPS, the clocks receive their 12 hour update from the GPS. If no GPS is present, the clocks receive their 12 hour update from Internet time servers if the Ethernet is connected to the Internet. If no Internet time server is available via the Ethernet, the System Clock receives its 12 hour update from the Real Time Clock. The high precision Real Time Clock is maintained by a 'keep-alive' super capacitor.

### ***Refreshing Parameters***

Several of the parameters in the WSDA<sup>®</sup>-1000 Control Panel are constantly changing such as System Time, Node List, Flash Card Utilization, etc. The WSDA<sup>®</sup>-1000 Control Panel does not automatically refresh the on-screen display of all parameters and keep the display of those parameters current. To refresh these parameters, the user can navigate between menu items, click the browser refresh, logout and login in, reboot, or cycle the power.

### ***WSDA<sup>®</sup>-1000 Control Panel Timeout***

The WSDA<sup>®</sup>-1000 Control Panel will timeout after 1 hour if it is not in use. The user will be required to Login again to regain control.

### ***Transmissions to SensorCloud<sup>™</sup>***

The WSDA<sup>®</sup>-1000 is set at the factory to transmit newly received data to the SensorCloud<sup>™</sup> at 2 minute intervals. To explain that a bit further, let's say that the WSDA<sup>®</sup>-1000 during its current cycle spends 4 minutes transmitting data to SensorCloud<sup>™</sup>. At the end of that transmission, the WSDA<sup>®</sup>-1000 waits 2 minutes and again sends its next swath of data. After that transmission ends, it waits 2 minutes and sends again. The length of time that it takes to send data to the SensorCloud<sup>™</sup> is purely a function of how much data is coming into the WSDA<sup>®</sup>-1000 from the wireless nodes it is servicing and Internet connection speeds.