

Spot RFLS User's Manual

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by InnerWireless

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1 Safety Information

In order to comply with FCC Radio Frequency (RF) exposure limits, Spot RFLS antennas must be located no closer to the human body than the distances specified below:

- Master Radio: 4.41 cm
- Beacon: 0.097 cm
- Tag: 0.06 cm

The Master Radio is intended for indoor use only unless used in an appropriately rated environmental enclosure. The Master Radio's antenna, power supply, and data cables must be indoors at all times. Data cables must be terminated indoors with certified equipment (i.e. switch, hub, etc.) if outdoor communication is desired.

2 Spot System Description

This document describes the use of the Spot RFLS, a Radio Frequency (RF) Tag Location System used for real-time and historical location tracking of high-value human and equipment assets.

Major sections of this document include the following topics:

- A basic description of the Spot System and its proper use
- Safety information
- User interface description
- FCC ID numbers and compliance statements

A block diagram of Spot RFLS is shown below:

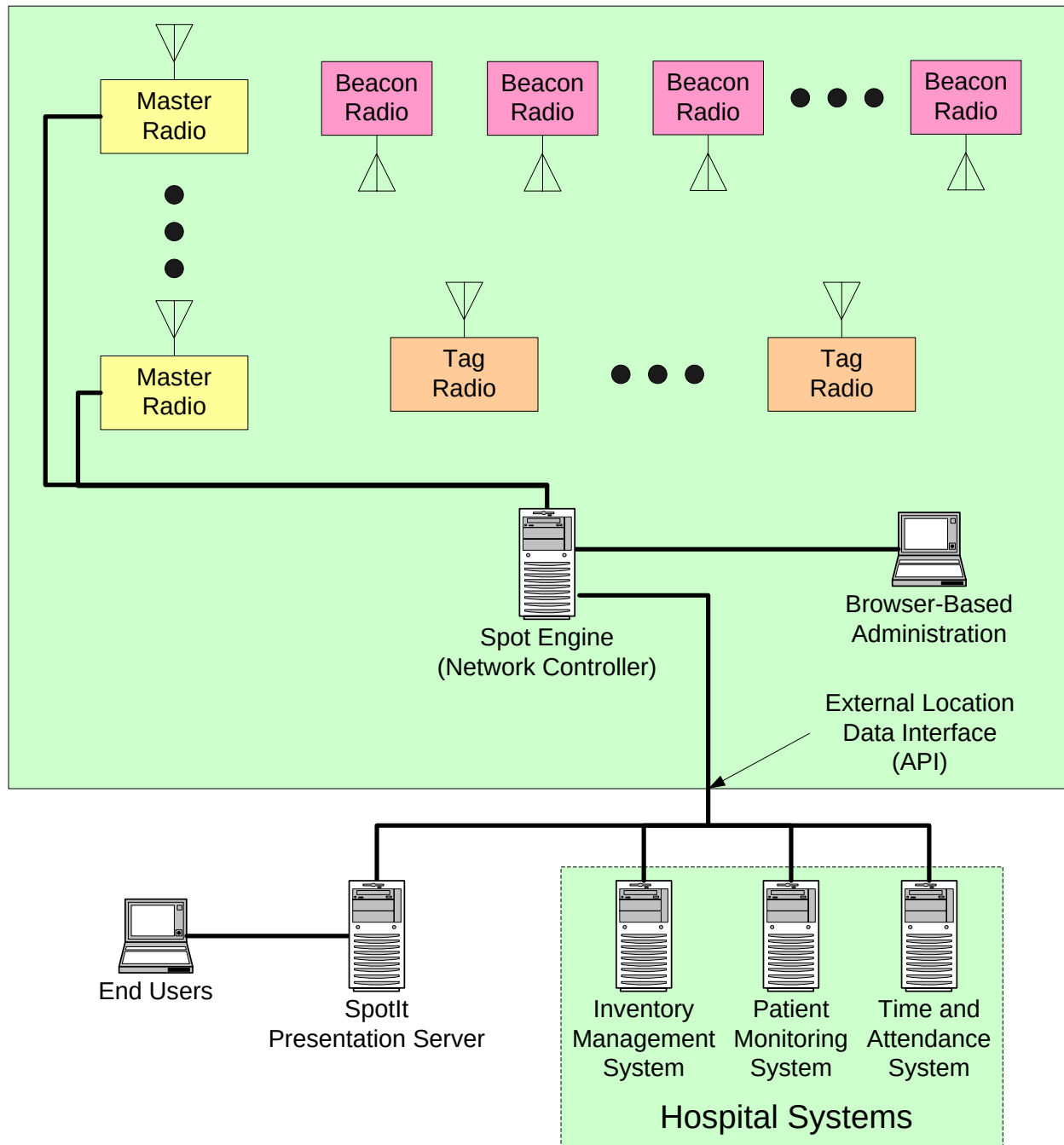


Figure 1 — Spot RFLS Block Diagram

Spot uses a system of *Master Radios* and *Beacons* to locate and track the position of *Tags*.

Tag location and history information is made available to other systems and applications through the *External Location Data Interface* (also called *API*) and also through a browser-based interface.

The Spot System is made up of the following components.

- **Spot Engine:**

- An appliance that controls the overall operation of the Spot System and delivers Tag location information via a web-based interface
- Other application servers can retrieve Tag location information through the Engine's *External Location Data Interface* (API)

CAUTION! *Never operate a Master Radio without an antenna or RF load.*

- **Master Radios:**

- Relay information from Beacons and Tags to the Spot Engine
- Are powered via their Ethernet network connections
- Require no direct user operation

- **Beacons:**

- Communicate with the Tags based on commands from the Master Radios
- Are battery-powered, designed for low current consumption to maximize battery life
- Require no direct user operation

- **Tags:**

- Receive transmissions from Beacons
- Transmit Beacon reports to Master Radios that Spot uses to compute location
- Are optimized for low power consumption to maximize battery life. Power consumption can be optimized for tracking mobile or fixed assets.

3 Using the Web-Based Interface

The user-level interface of the Spot System is accessed through a web browser. It provides a basic level of access to the Spot System through the Spot Engine Administration web interface.

NOTE: *Your Spot System Administrator must create an account for you to access this functionality.*

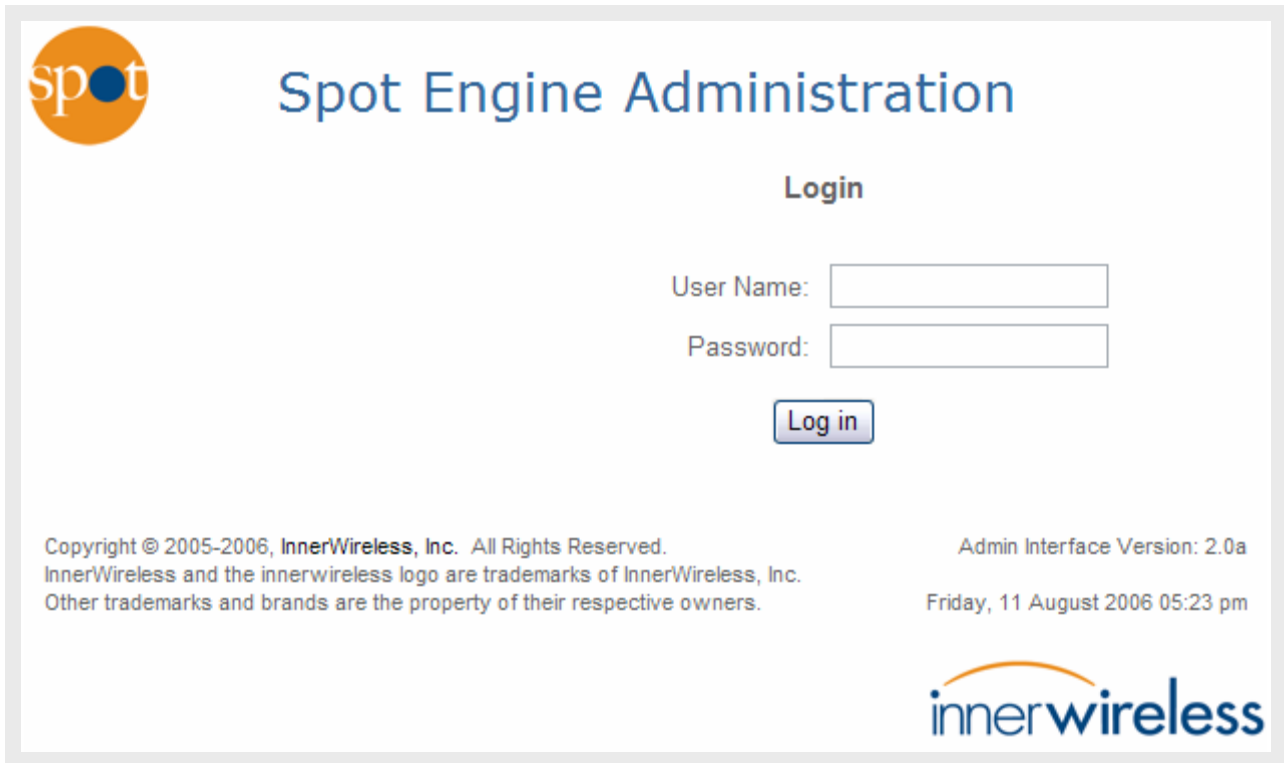
Most users will use other third-party applications (not the basic user interface described here) to access the information collected by the Spot System.

3.1 Login

Using a PC attached to the same local network (LAN) as the Spot Engine, log into the Spot Engine Administration web interface as follows.

In your web browser, enter the URL for the Engine's web interface you received from your Spot System Administrator when your user account was created.

The login window is displayed as shown in the following figure.



The image shows a web browser window titled "Spot Engine Administration". In the top left corner is the "spot" logo, which consists of the word "spot" in white lowercase letters inside an orange circle. The main heading "Spot Engine Administration" is in a large blue font. Below the heading, the word "Login" is centered in a smaller blue font. There are two input fields: "User Name:" followed by a text box, and "Password:" followed by a text box. Below these fields is a blue button with the text "Log in" in white. At the bottom left, there is a copyright notice: "Copyright © 2005-2006, InnerWireless, Inc. All Rights Reserved. InnerWireless and the innerwireless logo are trademarks of InnerWireless, Inc. Other trademarks and brands are the property of their respective owners." At the bottom right, it says "Admin Interface Version: 2.0a" and "Friday, 11 August 2006 05:23 pm". In the bottom right corner is the "innerwireless" logo, which features a blue arc above the word "innerwireless" in blue lowercase letters.

Figure 2 — Spot Engine Administration Login Window

Enter your **User Name** and **Password** and click **Log in**.

The *Welcome* window is displayed as shown in the following figure.

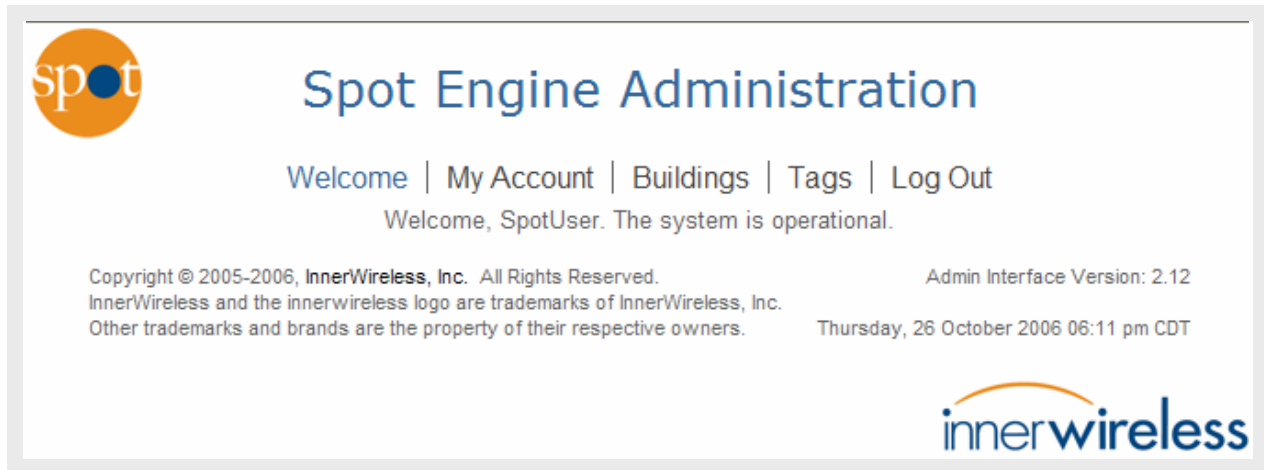


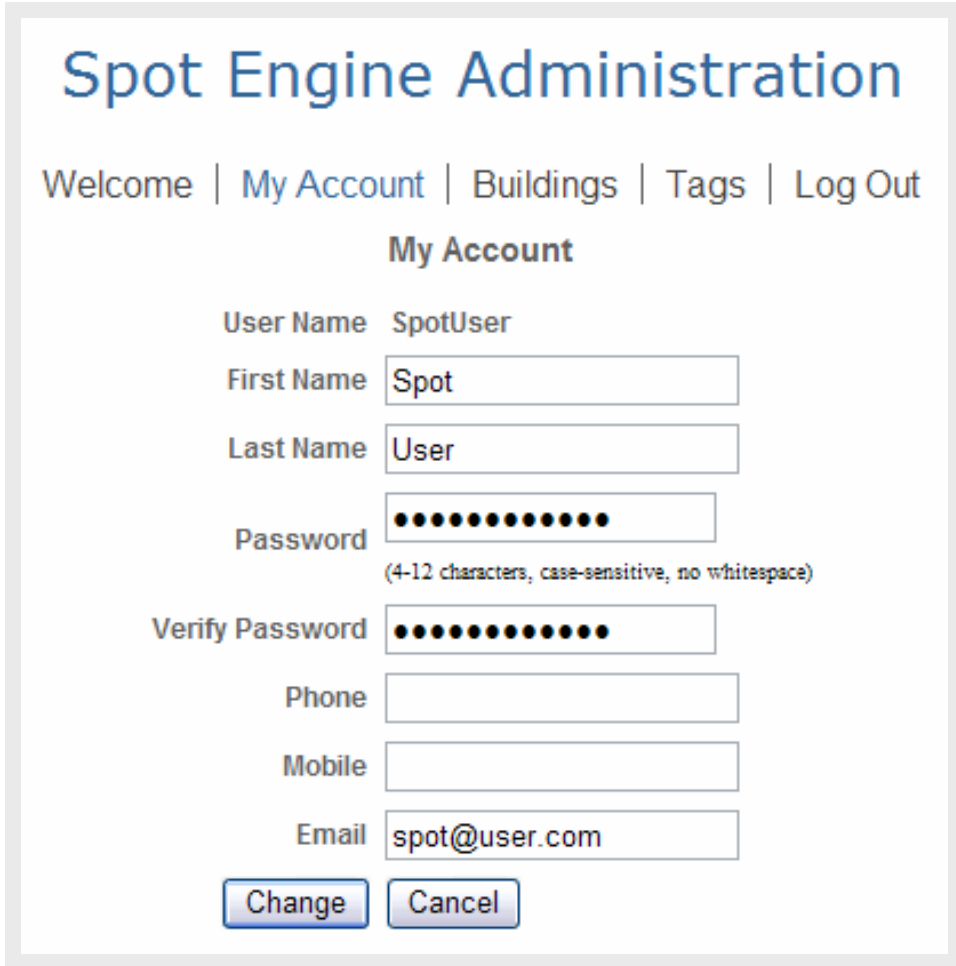
Figure 3 — Spot Engine Administration Welcome Window

The **Welcome** window indicates your login name, in this example **SpotUser**, and that **The system is operational**.

3.2 My Account

From the [Spot Engine Administration > Welcome](#) window shown in [Figure 3](#) on page 9, click [My Account](#).

The following window is displayed.



The image shows a web browser window titled "Spot Engine Administration". At the top, there is a navigation bar with links: "Welcome", "My Account" (which is highlighted in blue), "Buildings", "Tags", and "Log Out". Below the navigation bar, the page title "My Account" is centered. The form contains the following fields and labels:

- User Name**: SpotUser
- First Name**: Spot
- Last Name**: User
- Password**: A field filled with 12 black dots. Below it, a note reads "(4-12 characters, case-sensitive, no whitespace)".
- Verify Password**: A field filled with 12 black dots.
- Phone**: An empty text field.
- Mobile**: An empty text field.
- Email**: spot@user.com

At the bottom of the form, there are two buttons: "Change" and "Cancel".

Figure 4 — My Account Window

Make changes to your personal information as required and click [Change](#) to save.

3.3 List Tags

From the [Spot Engine Administration > Welcome](#) window shown in [Figure 3](#) on page 9, click [Tags > List](#).

The following window is displayed.

Spot Engine Administration				
Welcome My Account Buildings Tags Log Out				
List Add Maps History				
Page refresh rate (seconds) 0 Set Reset				
1 2 →				
ESN ↓	Most Recent Location ↑	Last Known Battery State ↑	Last Report ↑ Last Registration ↑	Action
Reporting Period Base Reporting Period				
20:00:00:00:00:00:00:00 5 Seconds 5 Seconds	Ground → 1.26 (Office 7)	Good	00:00:05 ago 05:55:47 ago	
20:00:00:00:00:00:00:25 5 Seconds 5 Seconds	Ground → 1.01 (Storage Closet)	Good	00:00:05 ago 05:55:48 ago	
20:00:00:00:00:00:00:27 5 Seconds 5 Seconds	Ground → 1.09 (Marketing)	Good	00:00:05 ago 05:56:28 ago	
20:00:00:00:00:00:00:29 5 Seconds 5 Seconds	Ground → 1.26 (Office 7)	Replace	00:00:05 ago 05:55:48 ago	
20:00:00:00:00:00:00:52 5 Seconds 5 Seconds	Ground → 1.26 (Office 7)	1 month left	00:00:05 ago 05:55:06 ago	
20:00:00:00:00:00:00:56 5 Seconds 5 Seconds	Ground → 1.09 (Marketing)	1 month left	00:00:05 ago 05:55:06 ago	
20:00:00:00:00:00:00:7E 5 Seconds 5 Seconds	Ground → 1.26 (Office 7)	1 month left	00:00:05 ago 05:56:28 ago	
30:00:00:00:00:00:00:05 5 Seconds 5 Seconds	Ground → 1.14 (Test Lab)	Good	00:00:05 ago 05:56:29 ago	

Figure 5 — List Tags Window

Click the link in the [ESN](#) column of the Tag you wish to track.

A view similar to the following figure is displayed.

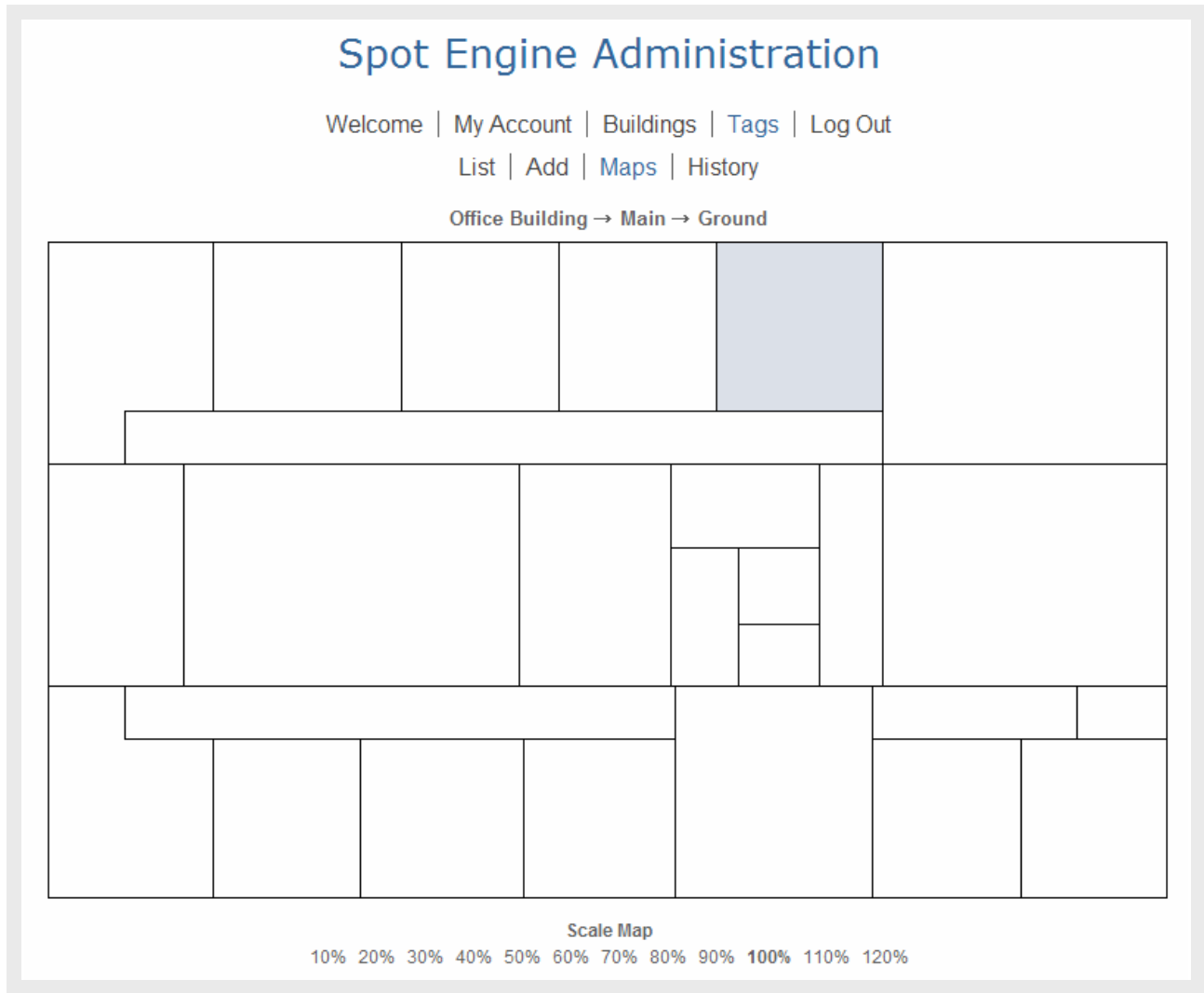


Figure 6 — Tags > Maps Window

A map is displayed ([Tags](#) > [Maps](#) window). The blue square indicates Tag location.

Click [History](#) to display the following window.

Spot Engine Administration

[Welcome](#) | [My Account](#) | [Buildings](#) | [Tags](#) | [Log Out](#)
[List](#) | [Add](#) | [Maps](#) | [History](#)

Start Date/Time

2006-10-26 ▾ 00 ▾ : 00 ▾ : 00 ▾

End Date/Time

2006-10-26 ▾ 17 ▾ : 18 ▾ : 37 ▾

[Search history prior to 27 September 2006](#)

ESN

i.e., 01:02:03:04:05:06:07:08

Events To Show

Registered as Active/Infrequent ☐	☒ Tag added to System
Registered as Active/Frequent ☐	☒ Requested Mode/Rate Change (Infrequent)
Registered as Inactive ☐	☒ Requested Mode/Rate Change (Frequent)
Entered Location Zone ☒	☒ Requested Mode change to Inactive
Left coverage ☒	☐ Requested battery conservation
Battery status changed ☐	☐ Requested termination of battery conservation
Battery level OK ☐	☒ Verified change of reporting rate
Tag deleted from System ☒	☒ Missed an expected report

Figure 7 — Tags > History Window

Use the options in this window to recall the location history of a particular Tag.

When you have selected your **Events To Show**, click **Submit** to display the location history of the Tag in question.

1 2 3 4 5 6 7 8 9 10 11 12 13 →							
Date/Time	Event	Reporting Rate	Battery Level	Report Count	Location	Time in Location	Notes
2006-10-25 23:56:45 CDT	Entered Location Zone	5 seconds	Good	7194	Office Building, Main, Ground, 1.25, Office 6	11:06:07	
2006-10-26 11:02:52 CDT	Entered Location Zone	5 seconds	Good	13	Office Building, Main, Ground, 1.15, Lobby	00:01:00	
2006-10-26 11:03:52 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.01, Storage Closet	00:00:05	
2006-10-26 11:03:57 CDT	Entered Location Zone	5 seconds	Good	10	Office Building, Main, Ground, 1.15, Lobby	00:00:50	
2006-10-26 11:04:47 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.18, North Hallway	00:00:05	
2006-10-26 11:04:52 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.01, Storage Closet	00:00:05	
2006-10-26 11:04:57 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.15, Lobby	00:00:05	
2006-10-26 11:05:02 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.01, Storage Closet	00:00:05	
2006-10-26 11:05:07 CDT	Entered Location Zone	5 seconds	Good	3	Office Building, Main, Ground, 1.15, Lobby	00:00:15	
2006-10-26 11:05:22 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.01, Storage Closet	00:00:05	
2006-10-26 11:05:27 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.15, Lobby	00:00:05	
2006-10-26 11:05:32 CDT	Entered Location Zone	5 seconds	Good	4	Office Building, Main, Ground, 1.01, Storage Closet	00:00:20	
2006-10-26 11:05:52 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.15, Lobby	00:00:05	
2006-10-26 11:05:57 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.01, Storage Closet	00:00:05	
2006-10-26 11:06:02 CDT	Entered Location Zone	5 seconds	Good	5	Office Building, Main, Ground, 1.15, Lobby	00:00:25	
2006-10-26 11:06:27 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.01, Storage Closet	00:00:05	
2006-10-26 11:06:32 CDT	Entered Location Zone	5 seconds	Good	1	Office Building, Main, Ground, 1.15, Lobby	00:00:05	
2006-10-26 11:06:37 CDT	Entered Location Zone	5 seconds	Good	12	Office Building, Main, Ground, 1.01, Storage Closet	00:01:00	

Figure 8 — Sample Tag Location History

3.4 Log Out

To end your session, click [Log Out](#) shown in [Figure 3](#) on page 9.

The following window is displayed.

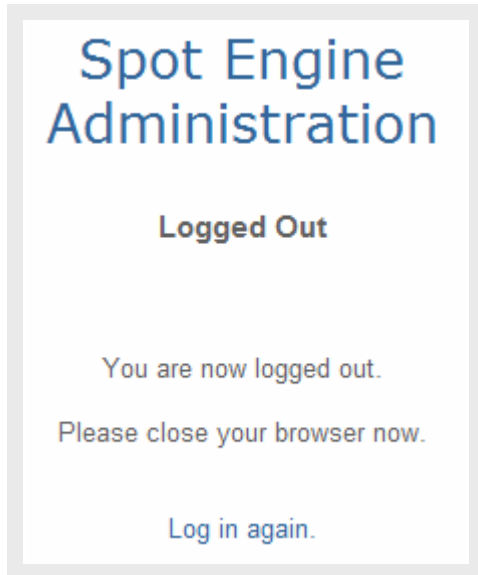


Figure 9 — Log Out Window

Appendix A – Master Radio FCC Compliance Information

Master Radio FCC ID: RO540004A001

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix B – Beacon FCC Compliance Information

Beacon FCC ID: RO540001A001

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix C – Tag FCC Compliance Information

Tag FCC ID: RO540002A001

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix D – Antenna Specification

The Master Radio is FCC certified for use with an antenna that meets the following requirements:

1. Maximum gain: 13.3 dBi
2. Type: monopole, omnidirectional
3. Nominal Impedance: 50 Ohm

FCC re-certification is required in order to use an antenna that does not meet the above specifications.

— End of Document