

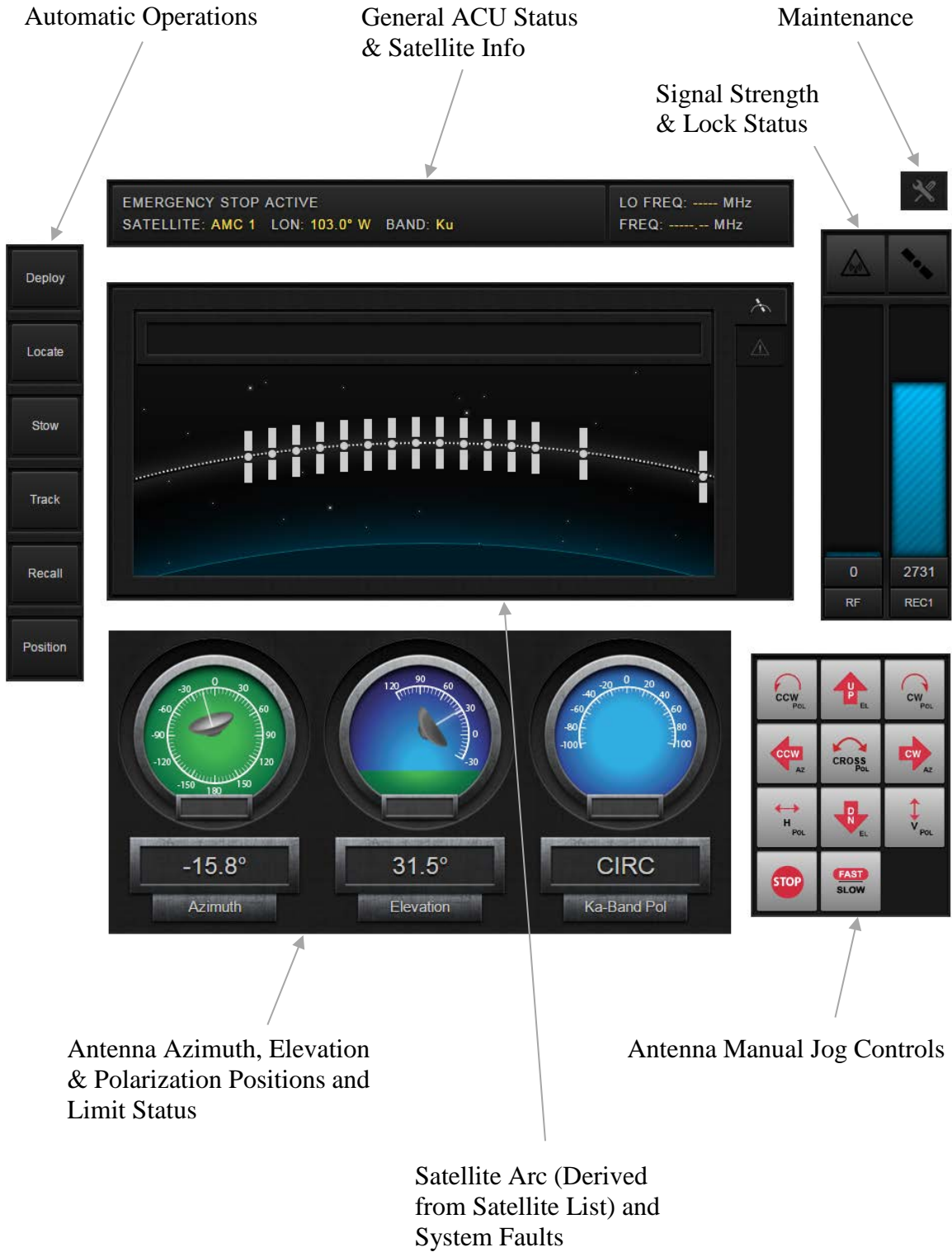
RC4000 Graphical User Interface Appendix for RC4000

1.0 Graphical GUI Overview

The graphical GUI interface can be accessed by typing the IP address of the ACU into the address bar of a web browser. The default IP address is 192.168.1.1.

This appendix describes the various screens available through the web-based graphical GUI. The GUI is made up of a single user interface page. This page consists of multiple forms of feedback of antenna status and ACU status. It also consists of multiple forms of control of the ACU and antenna positioning. Sub-pages will be displayed when there is additional information that needs to be displayed or retrieved from the user, during these times the main GUI page is "grayed-out" and cannot be changed until the sub-page is exited.





2.0 User Interface

2.1 Antenna Positions



The bottom center of the main page shows the current status of the Azimuth, Elevation and Polarization antenna positions. There are both graphical and numerical representations of the positions for each axis. These positions are continuously updated while the antenna is being manually or automatically jogged.

Alternate position displays

By clicking on the axis name (“Azimuth” or “Elevation”) the displayed position will change to one of a number of alternative displays. The default displayed position for the Azimuth axis is degrees relative to the Azimuth reference position (generally the Azimuth stow position.) The default displayed position for the Elevation axis is the angle in degrees above/below the horizon based upon the inclinometer.



For this antenna type and software version, the Polarization axis does not have any alternative displays available. The current display shows that the Polarization axis is defined as Ka-Band, Circular Polarization.

The following are the available alternative position displays for Azimuth and Elevation. The Polarization axis does not have any alternative displays for this antenna type.

Azimuth Count Value



Azimuth Magnetic Heading



Azimuth True Heading



Elevation Count Value



2.2 Manual Jog Controls



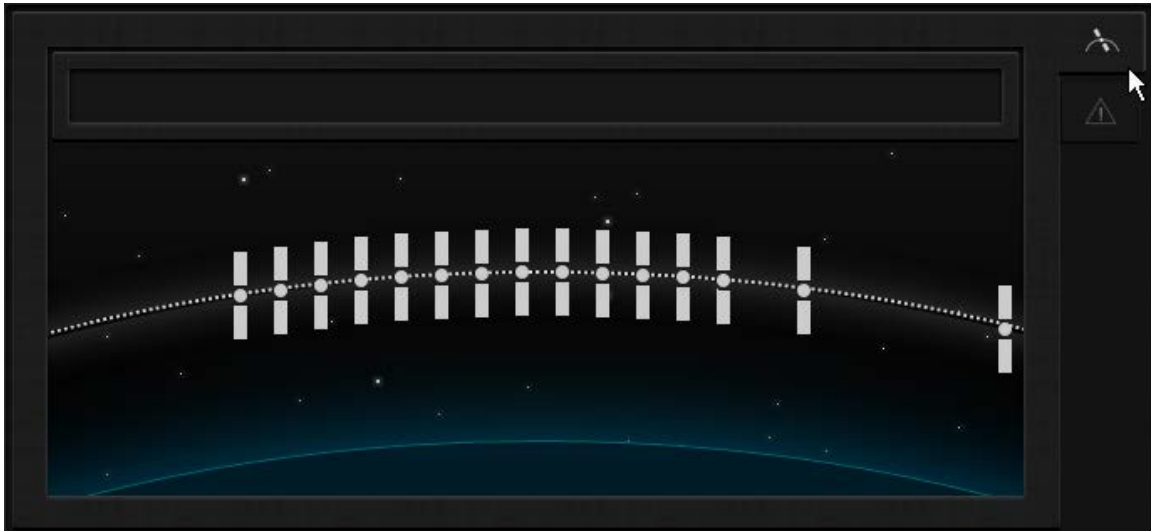
The bottom right side of the main page provides a partial keypad for manual jog control of the antenna. These “keys” only have standard jog controls and do not have extended functions as they do on a standard rack-mount keypad. A full description of the functions of the keypad can be found in the baseline RC4000 manual in section 3.1.2.

2.3 Satellite Arc Display

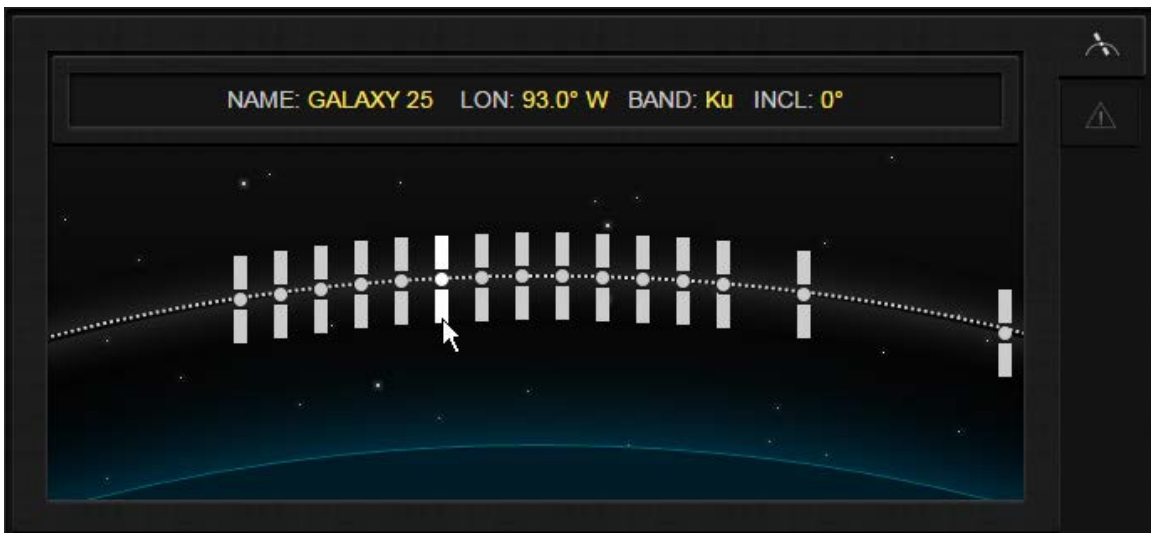
The center section of the page is used to display the arc of satellites when the satellite tab is selected.



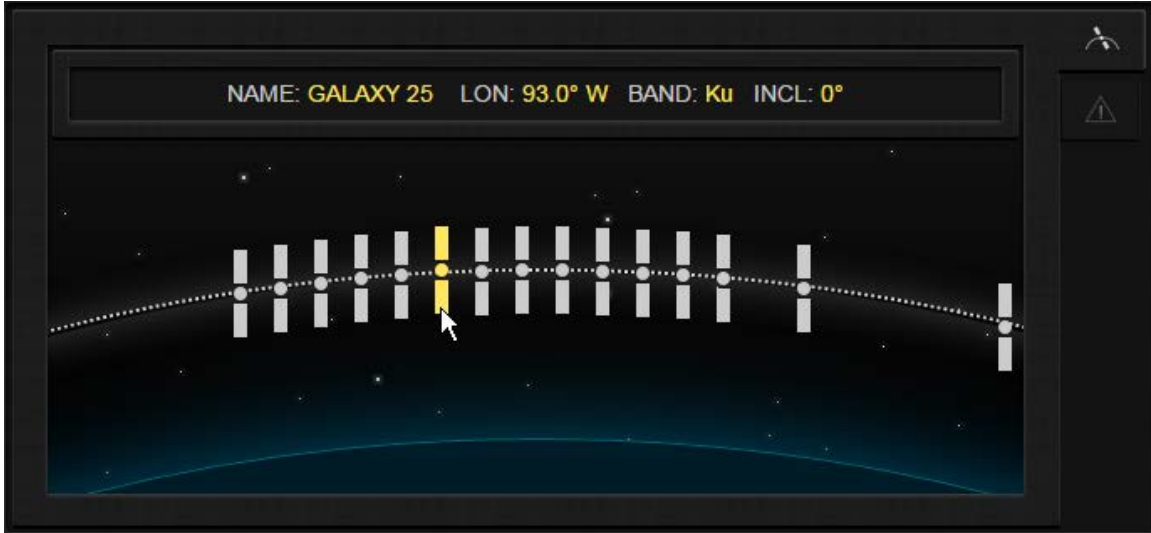
Select the Satellite tab:



When the mouse is rolled-over a particular satellite in the arc, that satellite's information is displayed in the window above the arc.




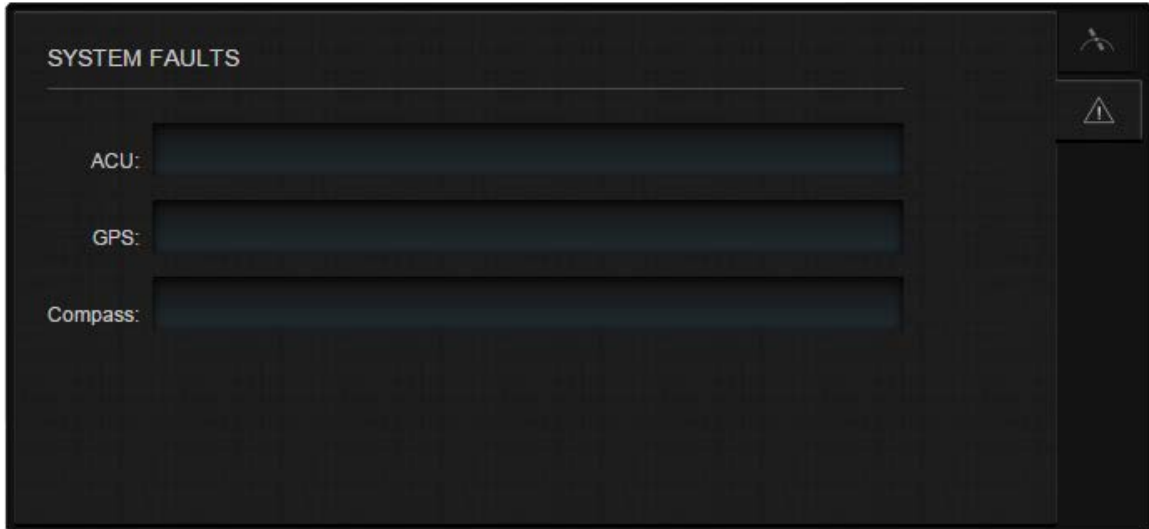
When you left-click the mouse on a satellite in the arc, the satellite will be colored yellow and will commence in auto-locating that particular satellite.



2.4 System Faults

The center section of the page is used to display the status of System Faults.

Select the Warning tab: 



This page displays the status of system faults for:

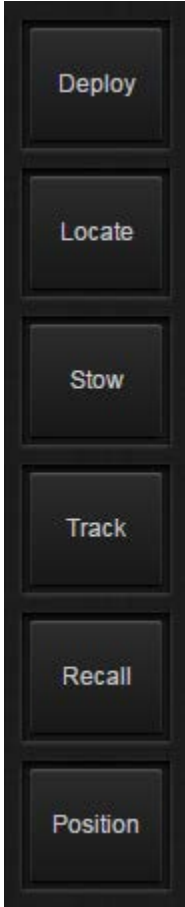
ACU

GPS

Compass

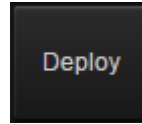
2.5 Automatic Operations

There are six automatic operations available on the left side of the page, including Deploy, Locate, Stow, Track, Recall and Position. (Position is not an automatic operation, but affects the Locate operation.)



2.5.1 Deploy

The DEPLOY mode automatically moves to the mount's predefined "deploy" position. The Deploy process is explained in detail in the baseline RC4000 manual in section 3.2.2.1.



To perform an automatic Deploy, press the Deploy button.

You must then confirm the automatic Deploy.



2.5.2 Locate

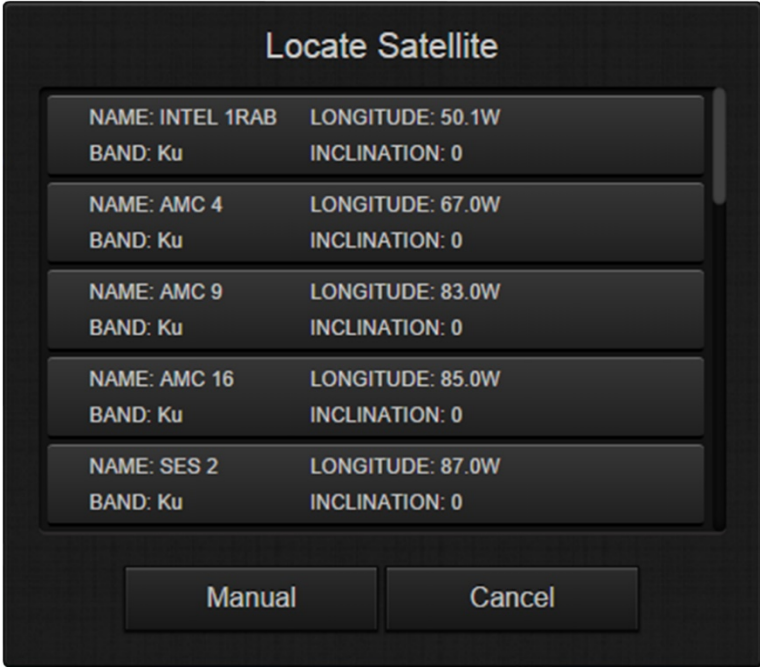
The LOCATE mode performs a calculation of the pointing angle (RC4000 Manual section 4.3.1) to a selected satellite based on the RC4000's estimate of where the antenna is positioned (lat/lon) and oriented (true heading). After the calculation is performed, the user may initiate an automatic antenna movement to locate the selected satellite.

The Locate process is explained in detail in the baseline RC4000 manual in section 3.2.2.3.



Locate

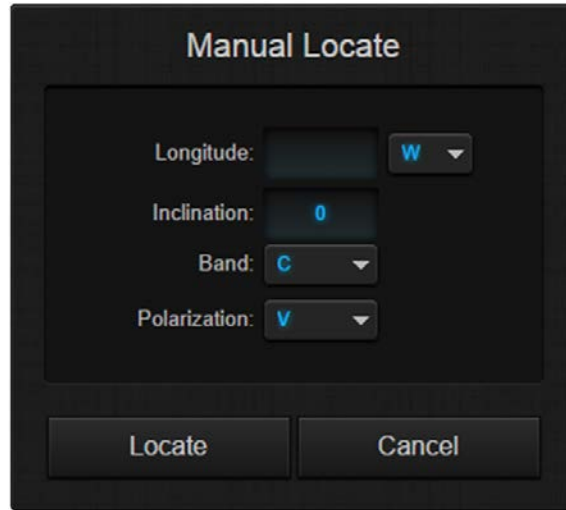
To perform an automatic Locate, press the Locate button. You can choose to locate from the Preset Satellite List. The Preset Satellite List is described in the baseline RC4000 manual in section 3.3.1.1.3.



Locate Satellite	
NAME: INTEL 1RAB	LONGITUDE: 50.1W
BAND: Ku	INCLINATION: 0
NAME: AMC 4	LONGITUDE: 67.0W
BAND: Ku	INCLINATION: 0
NAME: AMC 9	LONGITUDE: 83.0W
BAND: Ku	INCLINATION: 0
NAME: AMC 16	LONGITUDE: 85.0W
BAND: Ku	INCLINATION: 0
NAME: SES 2	LONGITUDE: 87.0W
BAND: Ku	INCLINATION: 0

Manual Cancel

Rather than choosing from the Preset Satellite List, you can select Manual and enter custom satellite data to be used for the Automatic Locate.

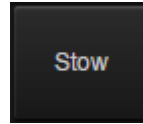


The image shows a 'Manual Locate' dialog box with a dark background. It contains four input fields: 'Longitude' with a dropdown menu showing 'W', 'Inclination' with a text input field containing '0', 'Band' with a dropdown menu showing 'C', and 'Polarization' with a dropdown menu showing 'V'. At the bottom of the dialog are two buttons: 'Locate' and 'Cancel'.

Once the satellite data is selected or entered, press the Locate button for the ACU to begin the Locate process.

2.5.3 Stow

The STOW mode automatically moves to the mount's predefined "stow" position. The Stow process is explained in detail in the baseline RC4000 manual in section 3.2.2.2.



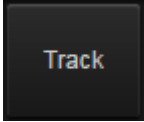
To perform an automatic Stow, press the Stow button.

You must then confirm the automatic Stow.



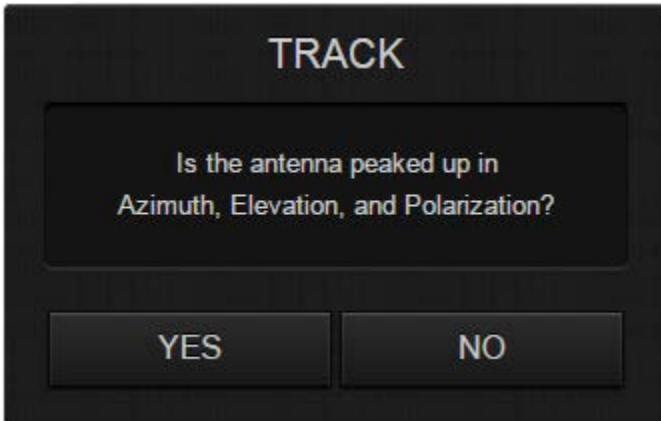
2.5.4 Track

TRACK mode stores a satellite's information into memory and then begins a Step Track / Memory Track operation on the satellite.

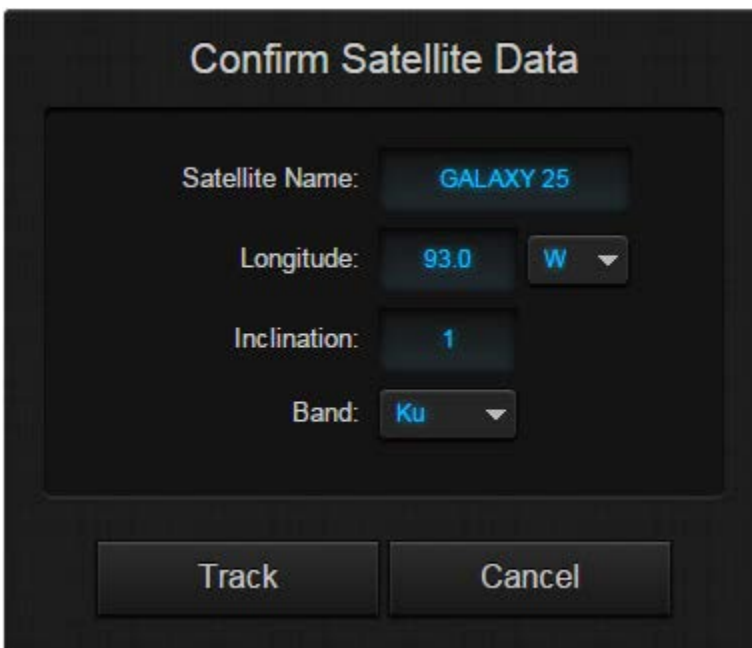


To perform a Track operation, press the Track button.

Before beginning a Track operation, a Locate operation must be performed and the antenna should be peaked up on the target satellite. You will be prompted to confirm that the antenna has been peaked on the satellite before continuing.



Next, the satellite information must be confirmed. Once the "Track" button is pressed, the controller will begin the Tracking operation. The Track process is explained in detail in the baseline RC4000 manual in section 3.2.2.9.



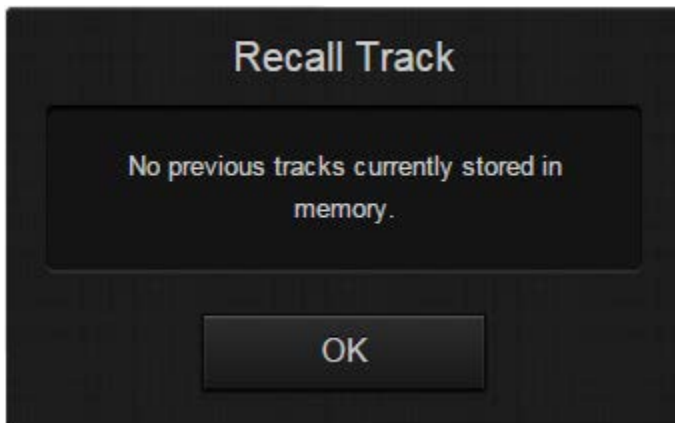
2.5.5 Recall

Satellites which have been stored in the controller's non-volatile memory (via TRACK) can be recalled from the RECALL mode.

A rectangular button with a dark background and the word "Recall" in white text.

To perform a Recall operation, press the Recall button.

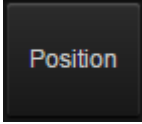
If no satellites have been stored through the Track mode previously, the following screen will be displayed.



If a Track had previously been performed and satellite information had been stored, then the Recall mode will allow the stored satellite(s) to be recalled. Antenna movement to the satellite's stored position will proceed. When the automatic move is complete, the controller will go into Track mode.

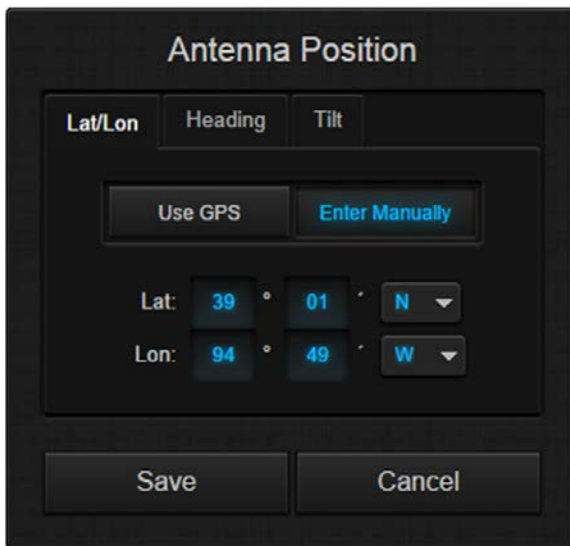
2.5.6 Position

The Position mode allows the user to set the latitude, longitude and heading of the vehicle for subsequent use in calculating pointing angles to satellites.

A dark rectangular button with the word "Position" written in a light-colored font.

To perform a Move To operation, press the Position button.

The first Antenna Position that may be changed is the latitude and longitude (Lat/Lon). This can be changed in one of two ways: by using the GPS to determine the new latitude and longitude or by Manually entering the data. Once the new latitude and longitude have been entered, press the Save button.

A screenshot of the "Antenna Position" dialog box. The title "Antenna Position" is at the top. Below the title are three tabs: "Lat/Lon", "Heading", and "Tilt". The "Lat/Lon" tab is selected. Inside the dialog, there are two buttons: "Use GPS" and "Enter Manually". Below these buttons, the latitude is set to 39° 01' N and the longitude is set to 94° 49' W. At the bottom of the dialog are "Save" and "Cancel" buttons.

Tab	Use GPS	Enter Manually	Lat	Lon
Lat/Lon	Use GPS	Enter Manually	39 ° 01' N	94 ° 49' W

The next Antenna Position that may be changed is the Heading. This can be changed in one of two ways: by using the Compass to determine the heading or by Manually entering the data. If the latitude and longitude have already been previously entered and saved, then the MagVar (Magnet Variation) value should already be entered automatically.

The screenshot shows the 'Antenna Position' window with the 'Heading' tab selected. The 'Use Compass' button is active, and the 'Enter Manually' button is highlighted in blue. The 'Mag' field is set to 175.0, 'MagVar' is -2.0, and 'True' is 177.0. The 'Save' and 'Cancel' buttons are at the bottom.

When entering the Heading manually, the Magnetic heading can be entered and the ACU will calculate the True heading based on the current Magnetic Variation, or the True heading can be entered directly.

Lastly, the Antenna Position mode allows the platform Tilt to be modified. The Tilt can be changed manually or automatically via the Tilt Sensor.

The screenshot shows the 'Antenna Position' window with the 'Tilt' tab selected. The 'Use Tilt Sensor' button is active, and the 'Enter Manually' button is highlighted in blue. The 'Pitch' field is set to 0.0 and 'Roll' is 0.0. The 'Save' and 'Cancel' buttons are at the bottom.

2.6 Signal Strength & Lock

There are two signal strength indicators on the right side of the main page. Above the signal strength indicators are two icons that highlight to provide additional status of whether it is ok to transmit and whether an automatic locate has completed.



2.6.1 Safe to Transmit

The following icon will highlight when it is safe to transmit with the antenna.

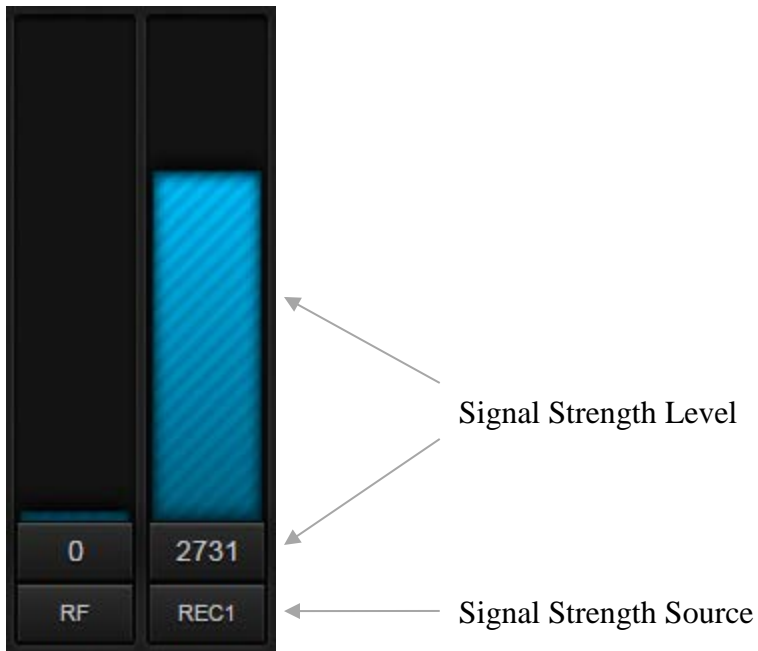


2.6.2 Locate Successful

The following icon will highlight when an automatic Locate has been successful.




2.6.3 Signal Strength Indicators

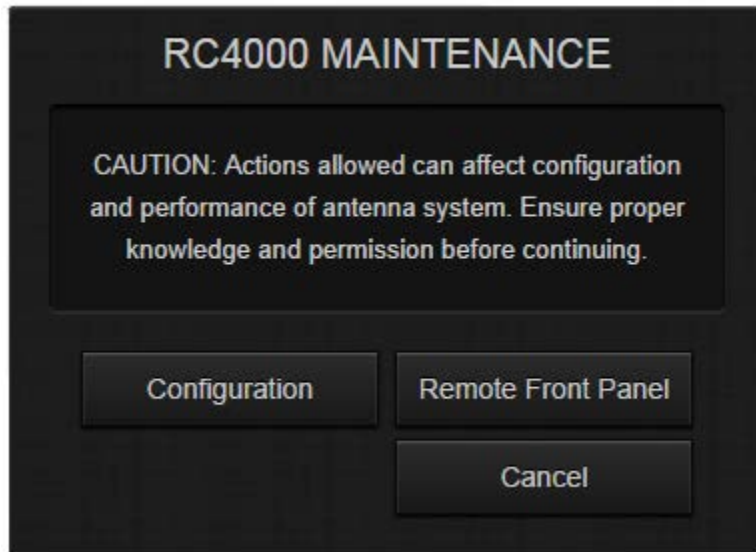




The indicator on the right can be toggled through three sources of signal strength by clicking on the signal strength name. The indicator on the left shows only the RF strength.

2.7 Maintenance

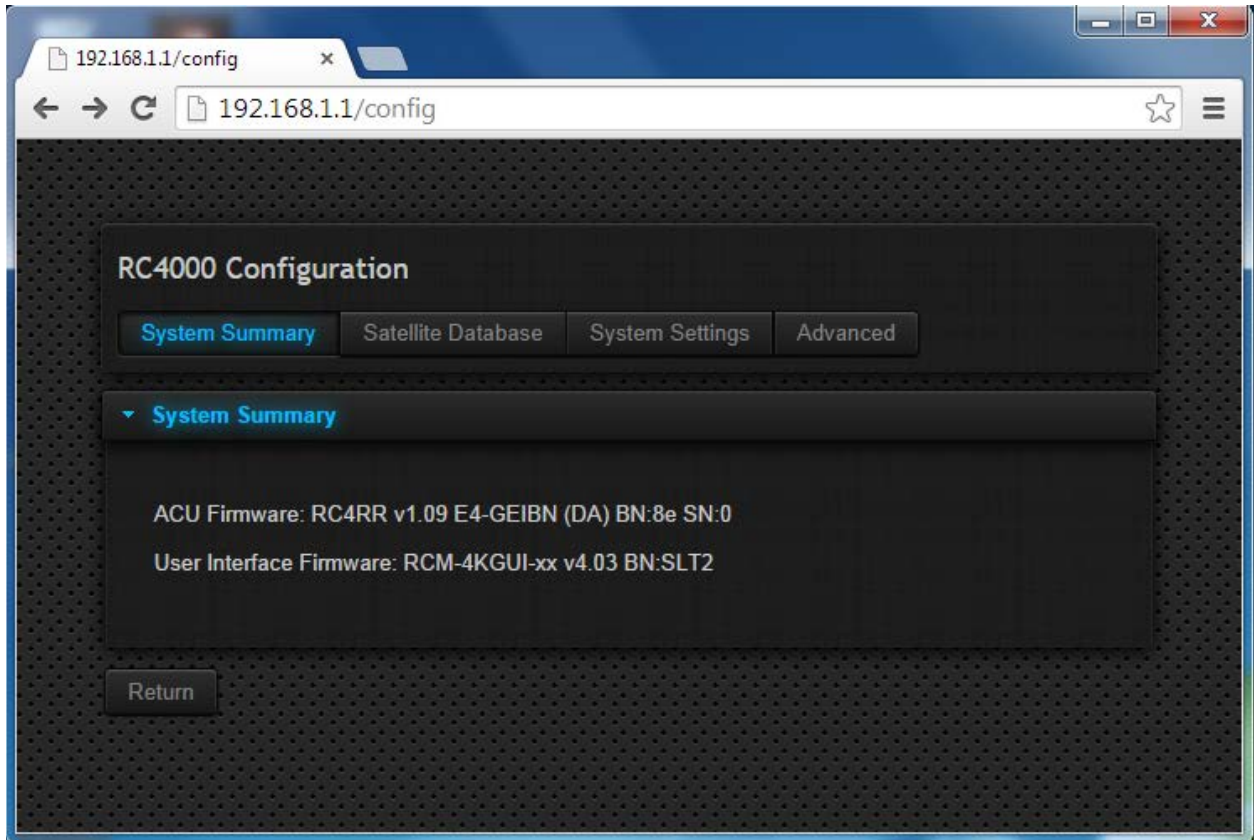
Configuration can be accessed by pressing the Maintenance button . This will bring up a new web panel that will provide options for selecting Configuration or Remote Front Panel:



The Remote Front Panel is used to replicate the typical front panel controls of a standard rack-mount antenna controller. The Remote Front Panel provides a 4x40 character display and a 4x4 keypad just as if the user were operating from the standard front panel. The information presented on the display and the functions of the keypad are described in detail in the baseline RC4000 User Manual.



The following sections in this appendix describes the various screens available through the web-based configuration interface. The main configuration interface panel has several navigation buttons. Clicking on these buttons will switch between the available pages. Any changes made to the current page must be saved by clicking the Save button before switching to a different page. The Save button will become enabled anytime a change has been detected. Some pages have several expandable panels. These panels can be expanded and collapsed to show or hide various items. There is no need to save when simply switching between panels.

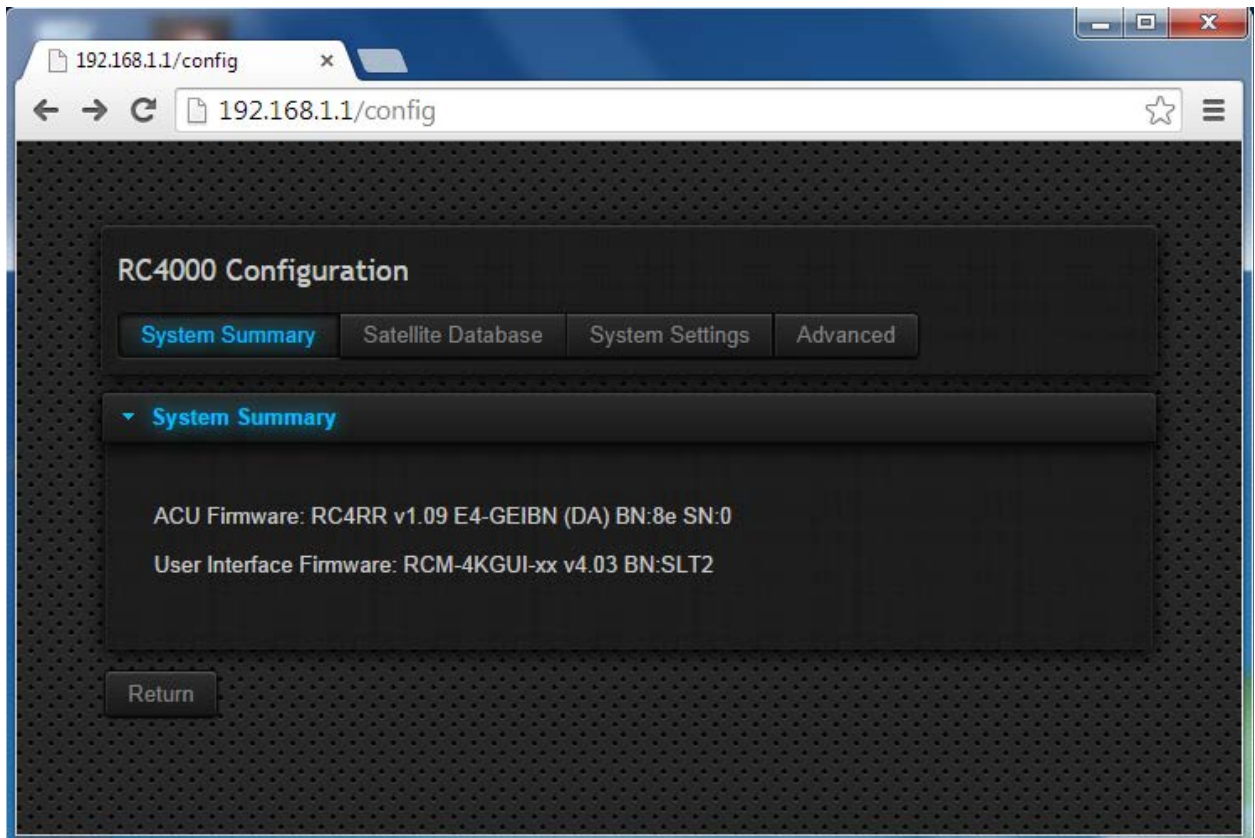


3.0 Configuration Items

The Configuration items set of panels provides screens for setting identifying the firmware versions, viewing and updating the satellite database and changing the performance of the remote front panel screens.

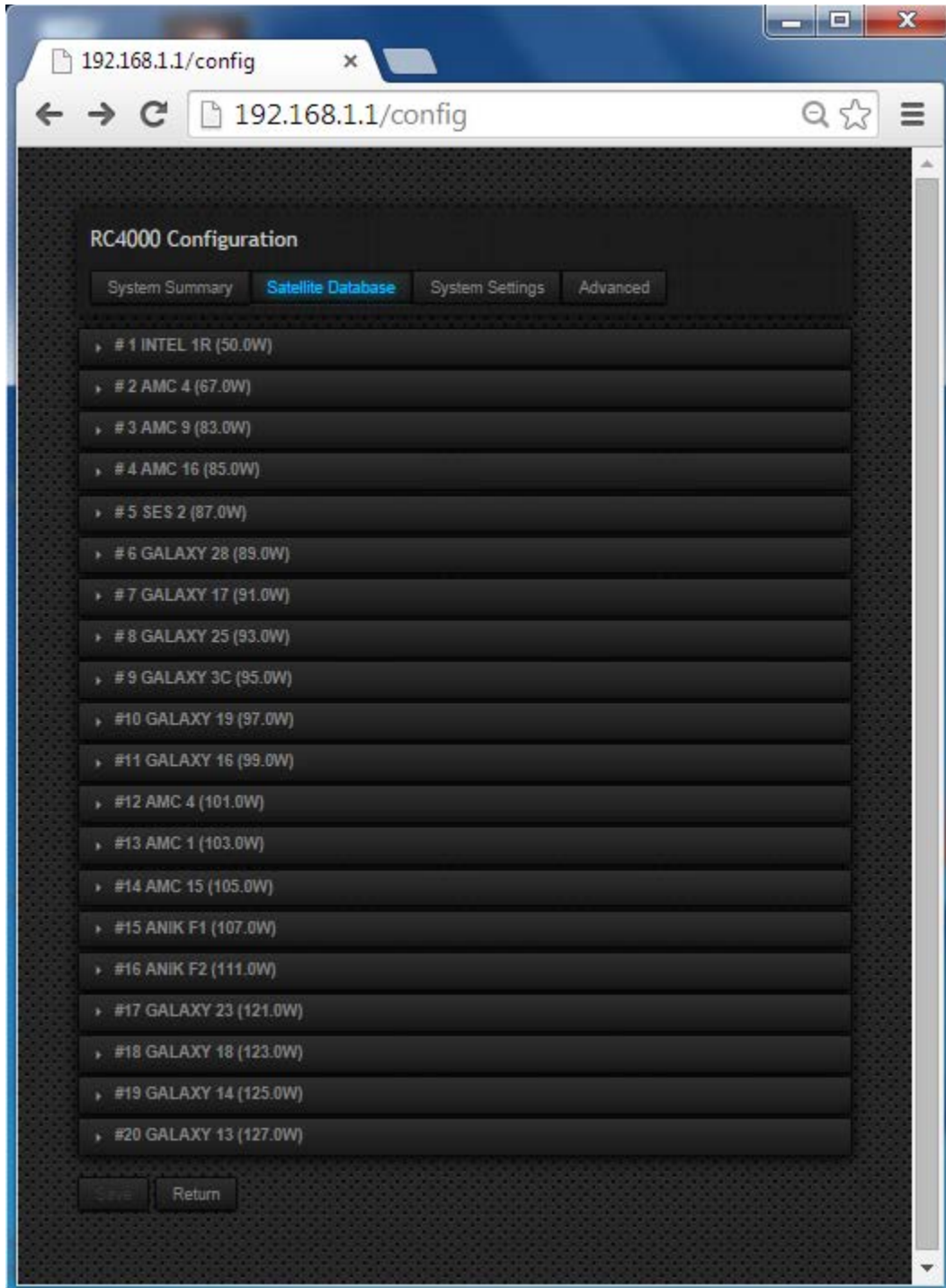
3.1 System Summary

The ACU Firmware version and the User Interface Firmware version is displayed in the following screen.



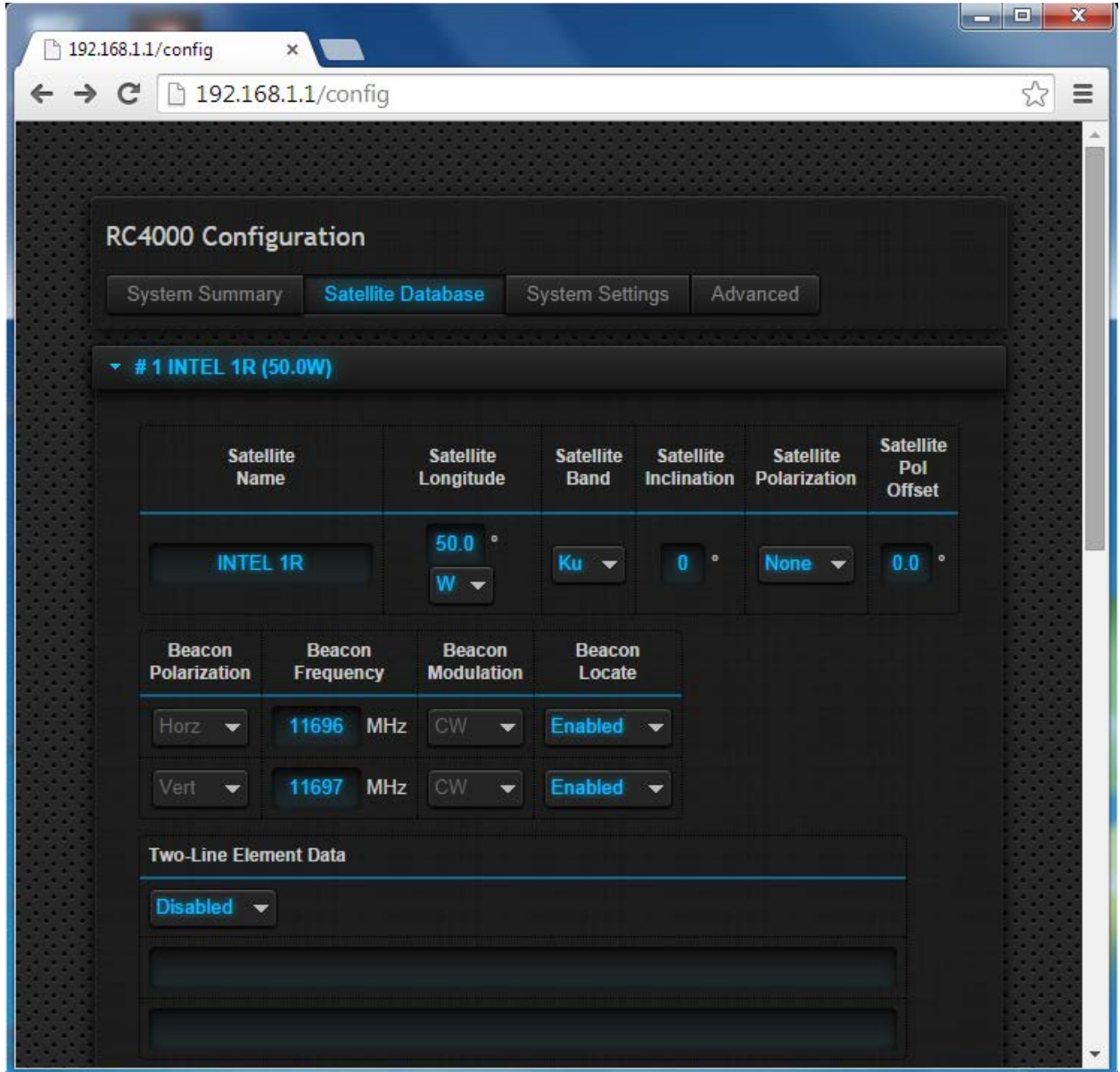
3.2 Satellite Database

A listing of the full satellite database is displayed on the Satellite Database panel. Each satellite entry can be expanded individually. The following screen shows an example full satellite database list.



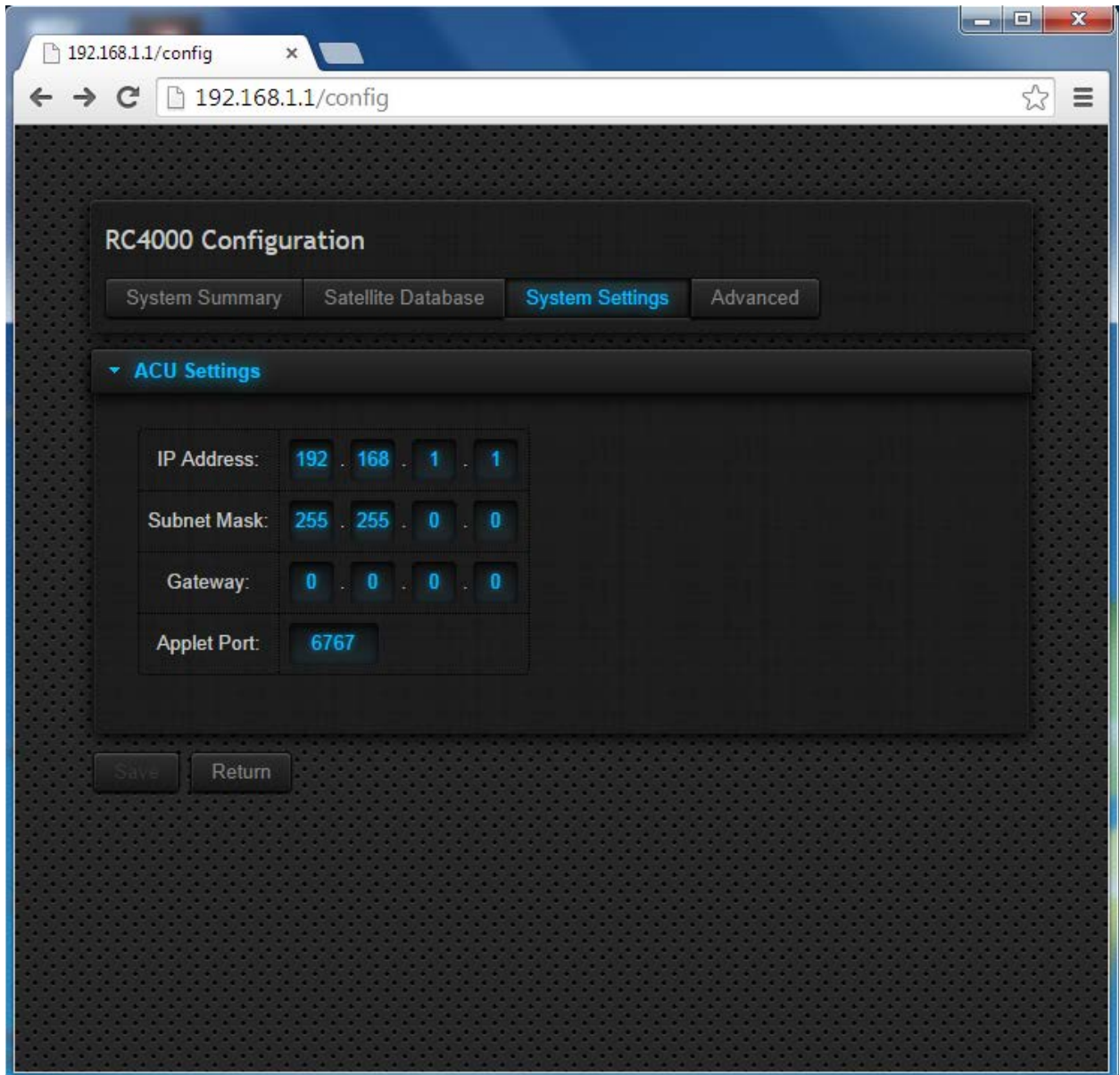
3.2.1 Satellite Configuration

The available entries define the attributes that allow the antenna controller to properly locate and/or track the satellite. Detailed descriptions of these entries can be found in the base RC4000 User Manual.



3.3 System Settings

The default IP Address, Subnet Mask, Gateway and Applet Port are shown in the following screen.



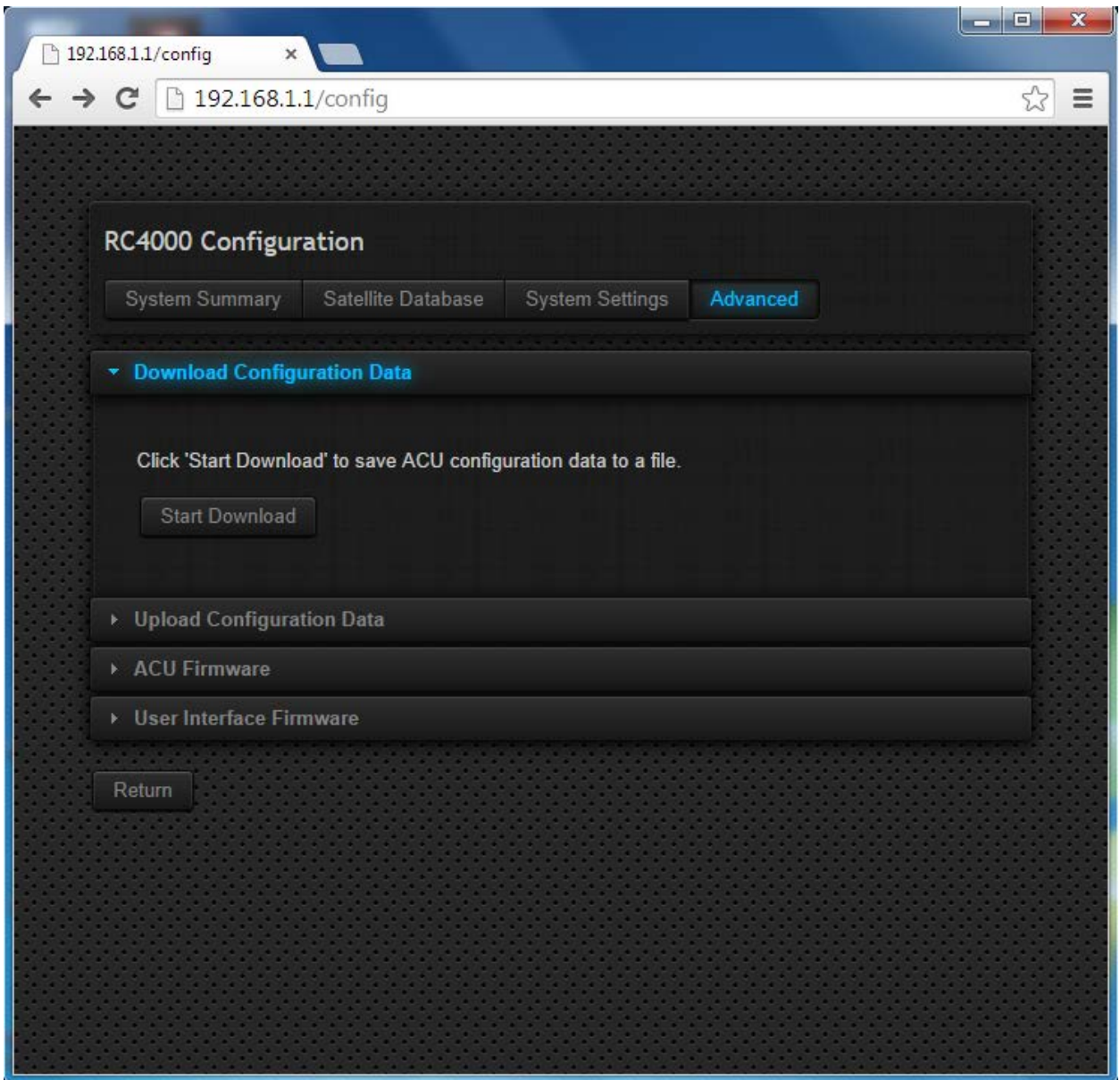
The interface must be reset if a change is made to any of these settings. After the reset is complete, the web browser will reload the page at the new settings.

The Applet Port is the port on which the antenna controller will use to communicate with the JAVA Applet performing the remote front panel interface. This port must be open and not in use on the target web-enabled device.

NOTE: The remote front panel pages are mechanized as a Java Applet. If Java is not available on the web-enabled device in use, an error will be displayed when attempting to access these pages.

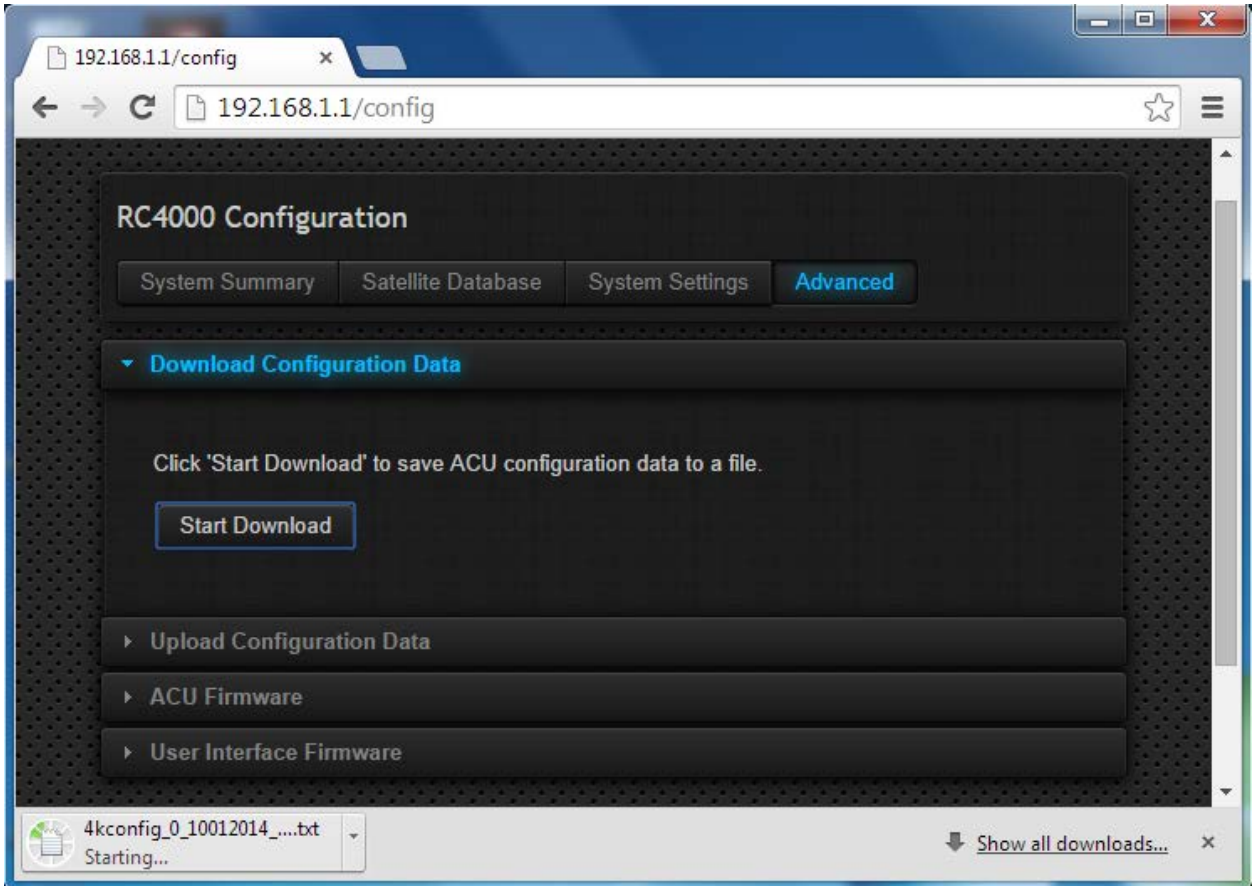
3.4 Advanced

The Advanced panel provides options for uploading and downloading firmware to the RC4000.



3.4.1 Download Configuration Data

Clicking on the Start Download button will begin a download of the ACU configuration to a text file.

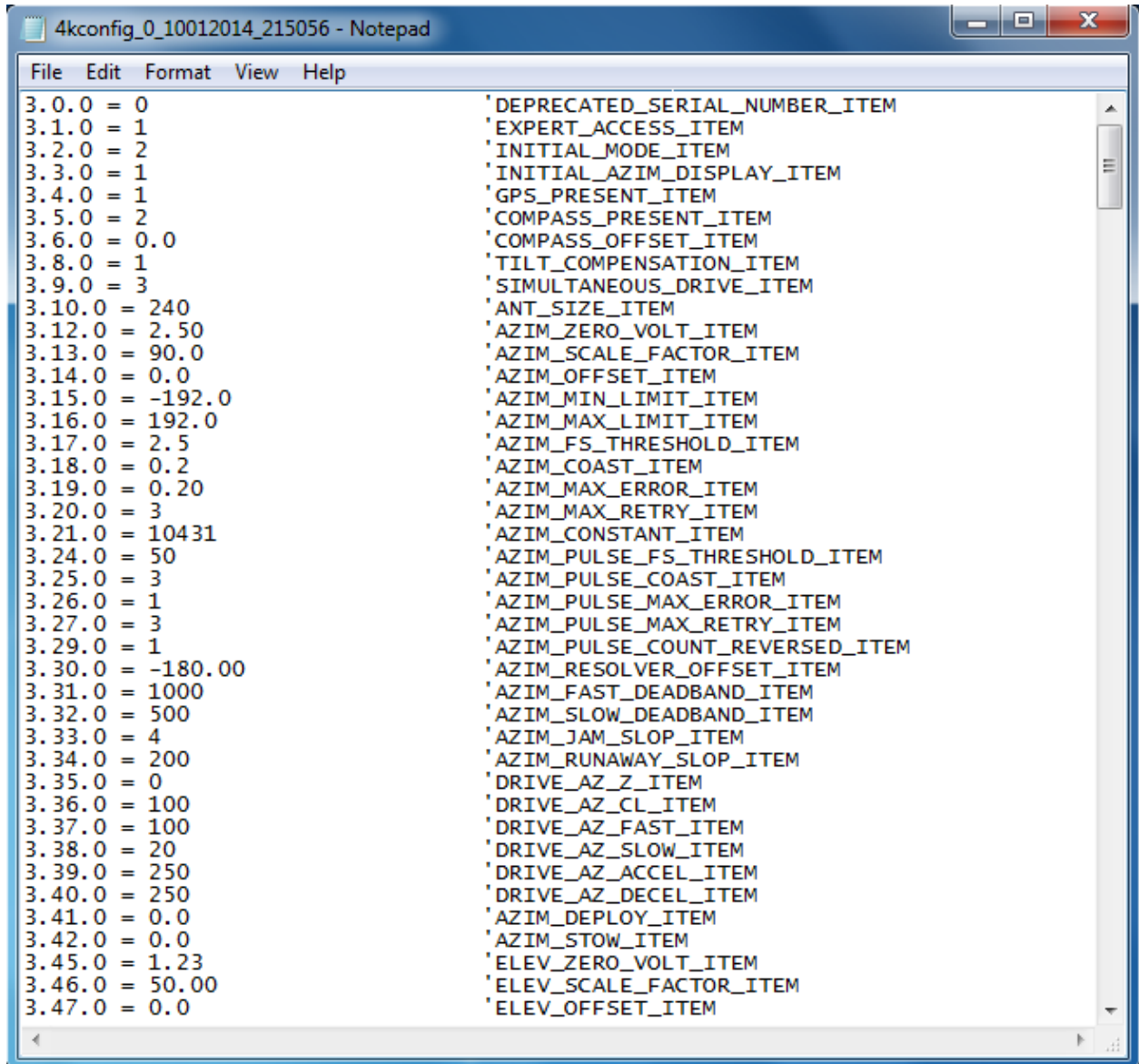


The configuration data text file will look like the following diagram. The configuration data that can be changed in the text file for upload back into the RC4000 is the value immediately following the “=”. A description of the entry is to the right of the configuration data.

For example, on the line that shows:

3.10.0 = 240 'ANT_SIZE_ITEM

The configuration data is “240”, which describes the Antenna Size as 240cm in diameter.



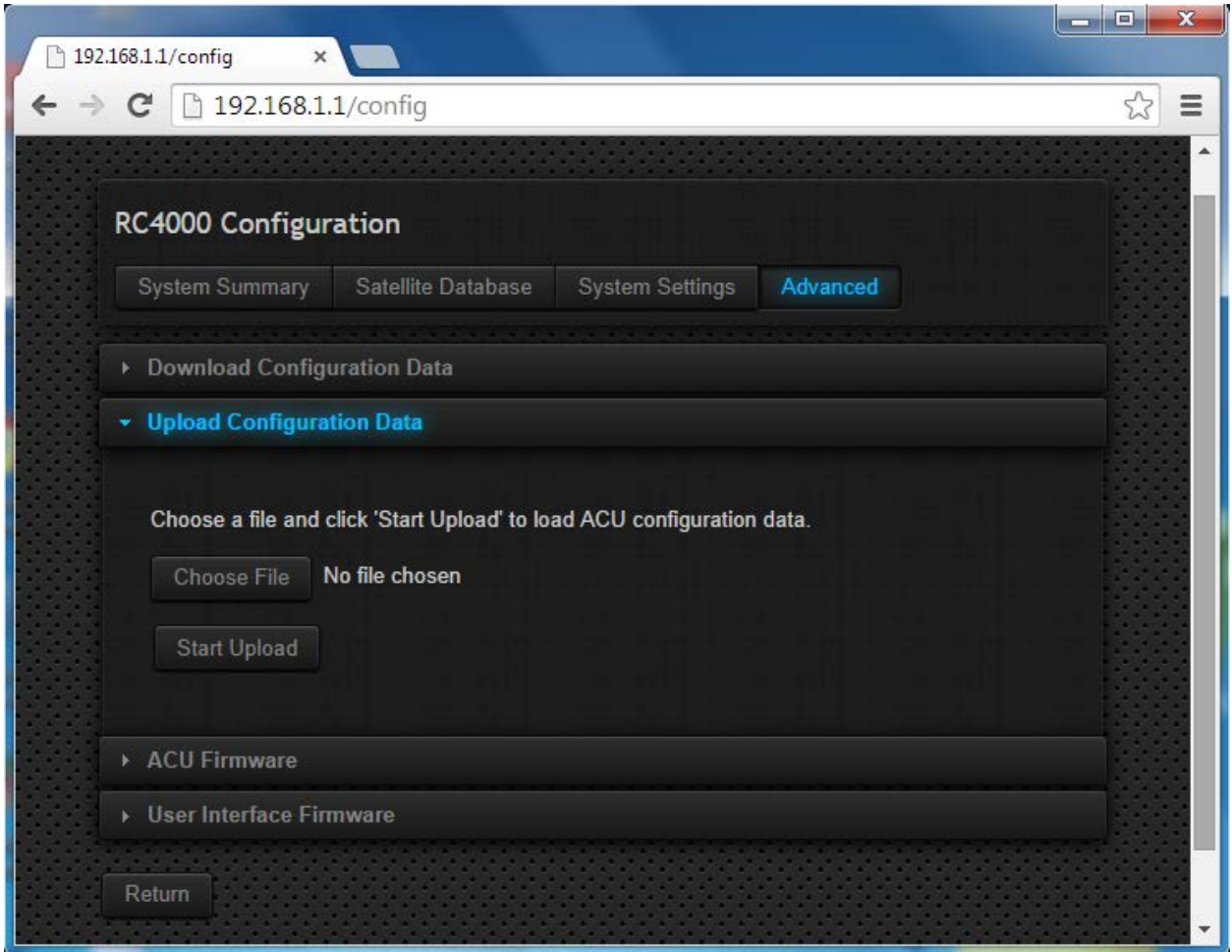
```

4kconfig_0_10012014_215056 - Notepad
File Edit Format View Help
3.0.0 = 0 'DEPRECATED_SERIAL_NUMBER_ITEM
3.1.0 = 1 'EXPERT_ACCESS_ITEM
3.2.0 = 2 'INITIAL_MODE_ITEM
3.3.0 = 1 'INITIAL_AZIM_DISPLAY_ITEM
3.4.0 = 1 'GPS_PRESENT_ITEM
3.5.0 = 2 'COMPASS_PRESENT_ITEM
3.6.0 = 0.0 'COMPASS_OFFSET_ITEM
3.8.0 = 1 'TILT_COMPENSATION_ITEM
3.9.0 = 3 'SIMULTANEOUS_DRIVE_ITEM
3.10.0 = 240 'ANT_SIZE_ITEM
3.12.0 = 2.50 'AZIM_ZERO_VOLT_ITEM
3.13.0 = 90.0 'AZIM_SCALE_FACTOR_ITEM
3.14.0 = 0.0 'AZIM_OFFSET_ITEM
3.15.0 = -192.0 'AZIM_MIN_LIMIT_ITEM
3.16.0 = 192.0 'AZIM_MAX_LIMIT_ITEM
3.17.0 = 2.5 'AZIM_FS_THRESHOLD_ITEM
3.18.0 = 0.2 'AZIM_COAST_ITEM
3.19.0 = 0.20 'AZIM_MAX_ERROR_ITEM
3.20.0 = 3 'AZIM_MAX_RETRY_ITEM
3.21.0 = 10431 'AZIM_CONSTANT_ITEM
3.24.0 = 50 'AZIM_PULSE_FS_THRESHOLD_ITEM
3.25.0 = 3 'AZIM_PULSE_COAST_ITEM
3.26.0 = 1 'AZIM_PULSE_MAX_ERROR_ITEM
3.27.0 = 3 'AZIM_PULSE_MAX_RETRY_ITEM
3.29.0 = 1 'AZIM_PULSE_COUNT_REVERSED_ITEM
3.30.0 = -180.00 'AZIM_RESOLVER_OFFSET_ITEM
3.31.0 = 1000 'AZIM_FAST_DEADBAND_ITEM
3.32.0 = 500 'AZIM_SLOW_DEADBAND_ITEM
3.33.0 = 4 'AZIM_JAM_SLOP_ITEM
3.34.0 = 200 'AZIM_RUNAWAY_SLOP_ITEM
3.35.0 = 0 'DRIVE_AZ_Z_ITEM
3.36.0 = 100 'DRIVE_AZ_CL_ITEM
3.37.0 = 100 'DRIVE_AZ_FAST_ITEM
3.38.0 = 20 'DRIVE_AZ_SLOW_ITEM
3.39.0 = 250 'DRIVE_AZ_ACCEL_ITEM
3.40.0 = 250 'DRIVE_AZ_DECEL_ITEM
3.41.0 = 0.0 'AZIM_DEPLOY_ITEM
3.42.0 = 0.0 'AZIM_STOW_ITEM
3.45.0 = 1.23 'ELEV_ZERO_VOLT_ITEM
3.46.0 = 50.00 'ELEV_SCALE_FACTOR_ITEM
3.47.0 = 0.0 'ELEV_OFFSET_ITEM

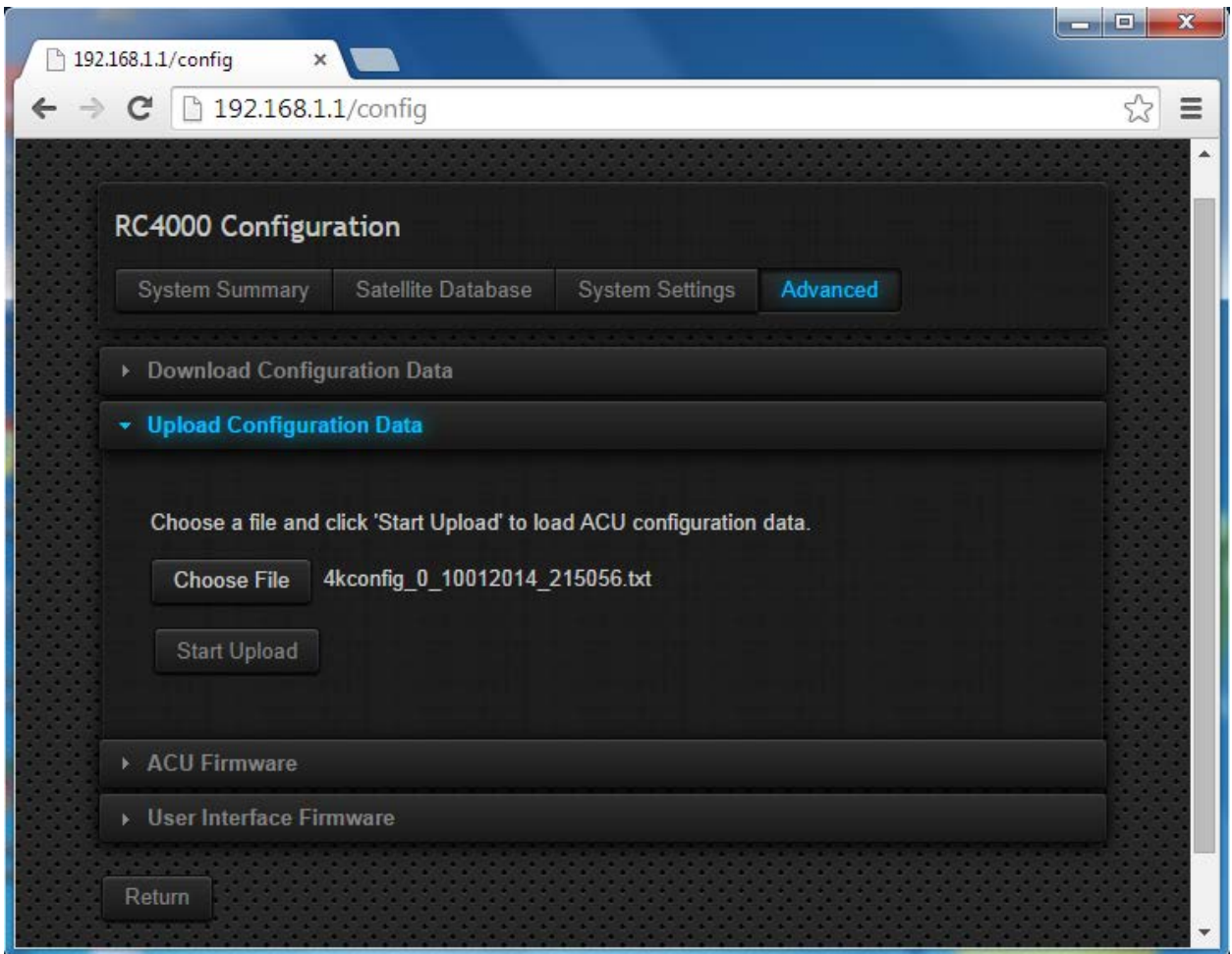
```

3.4.2 Upload Configuration Data

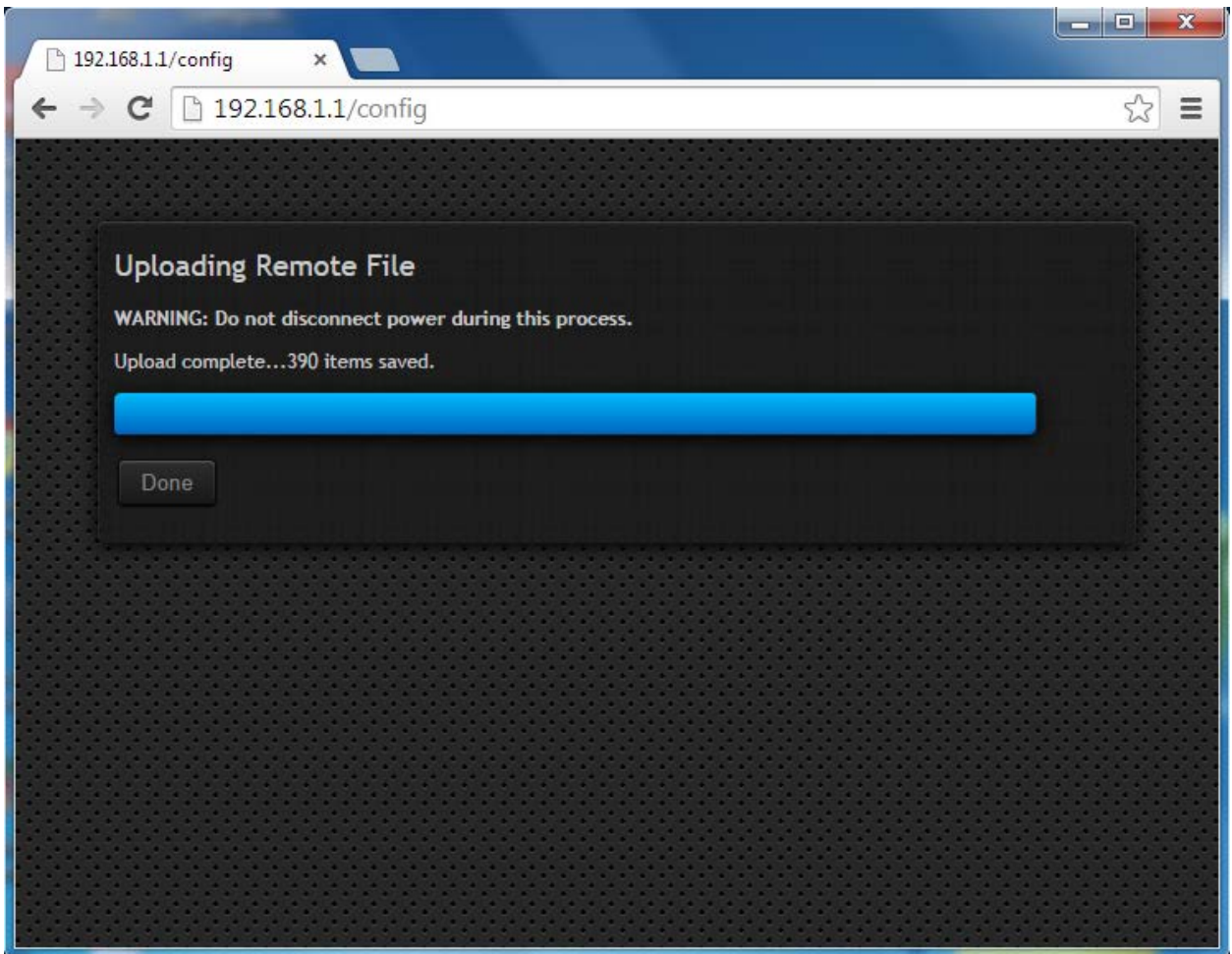
Configuration data that has previously been saved or modified in a text file can be uploaded into the RC4000.



Press the Choose File button, select the appropriate file to be uploaded (.txt file type). The screen should now look like the following diagram. Verify that the text file you have chosen is the same as is shown to the right of the Choose File button.

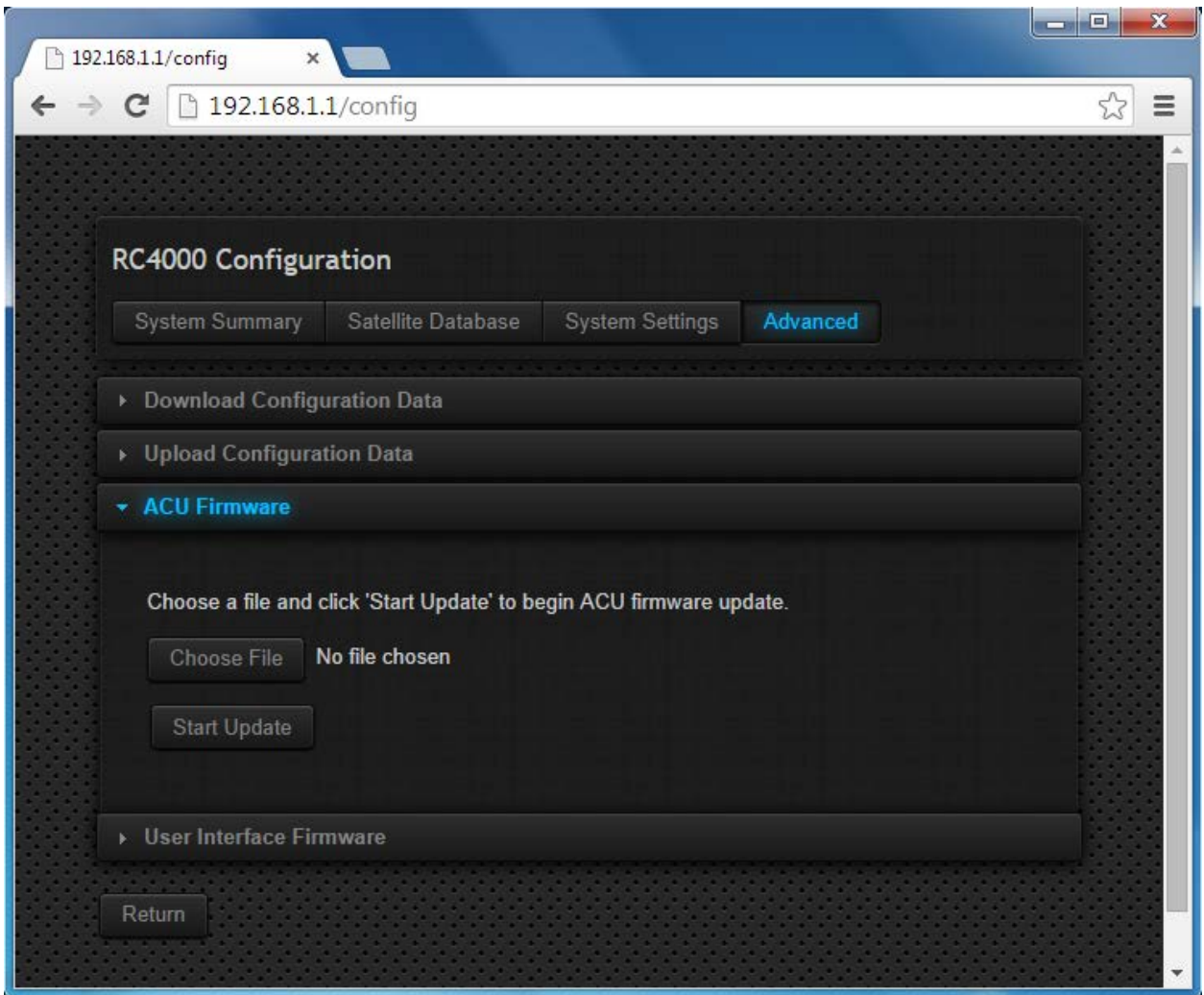


Press the Start Upload button. The panel will change to show the status of the upload process. Once the upload is complete, press the Done button. You will see that you are directed back to the System Summary panel.

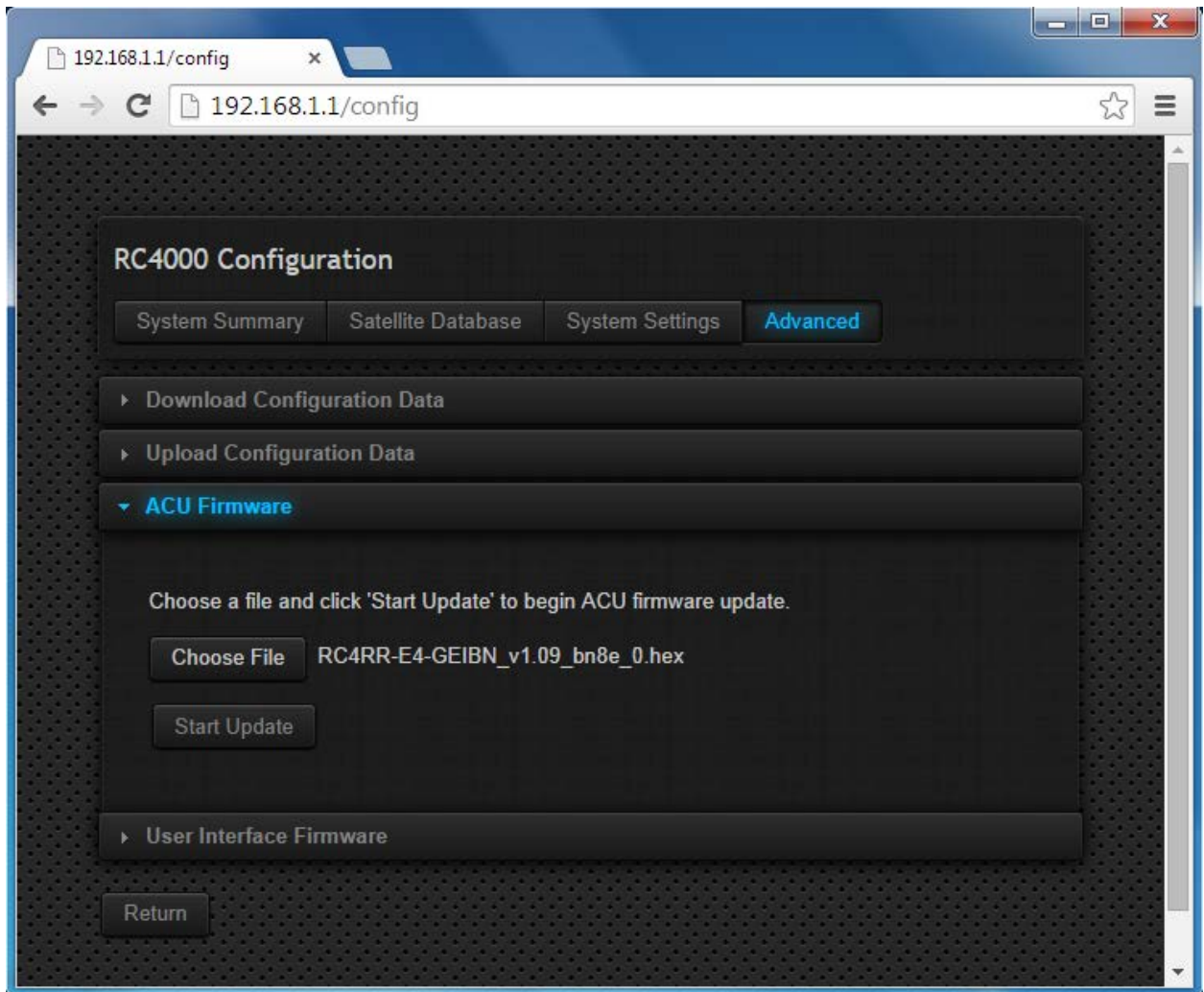


3.4.3 ACU Firmware

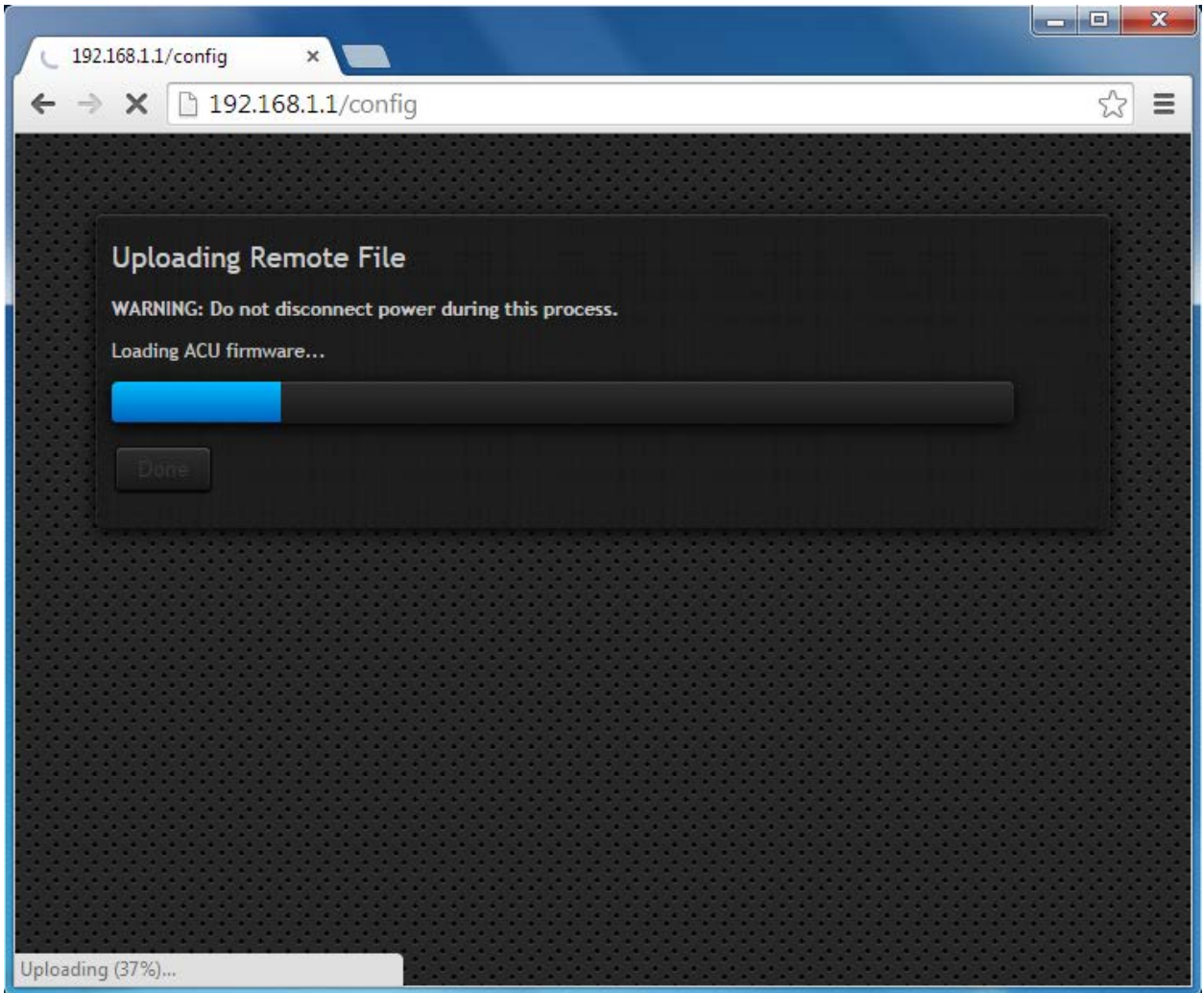
An ACU Firmware hex file can be uploaded.



Press the Choose File button, select the appropriate file to be uploaded (.hex file type). The screen should now look like the following diagram. Verify that the hex file you have chosen is the same as is shown to the right of the Choose File button.

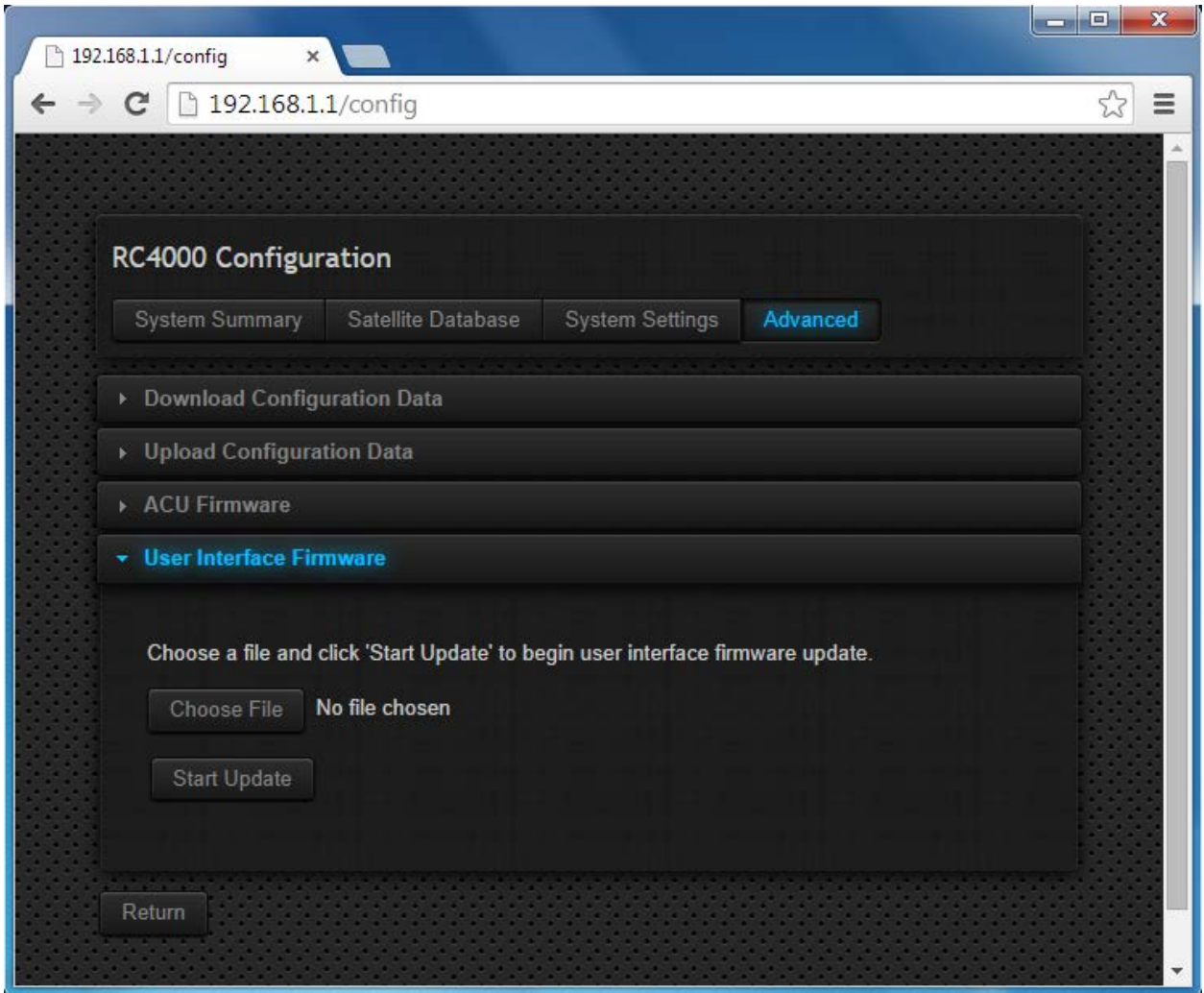


Press the Start Upload button. The panel will change to show the status of the upload process. Once the upload is complete, press the Done button. You will see that you are directed back to the System Summary panel.

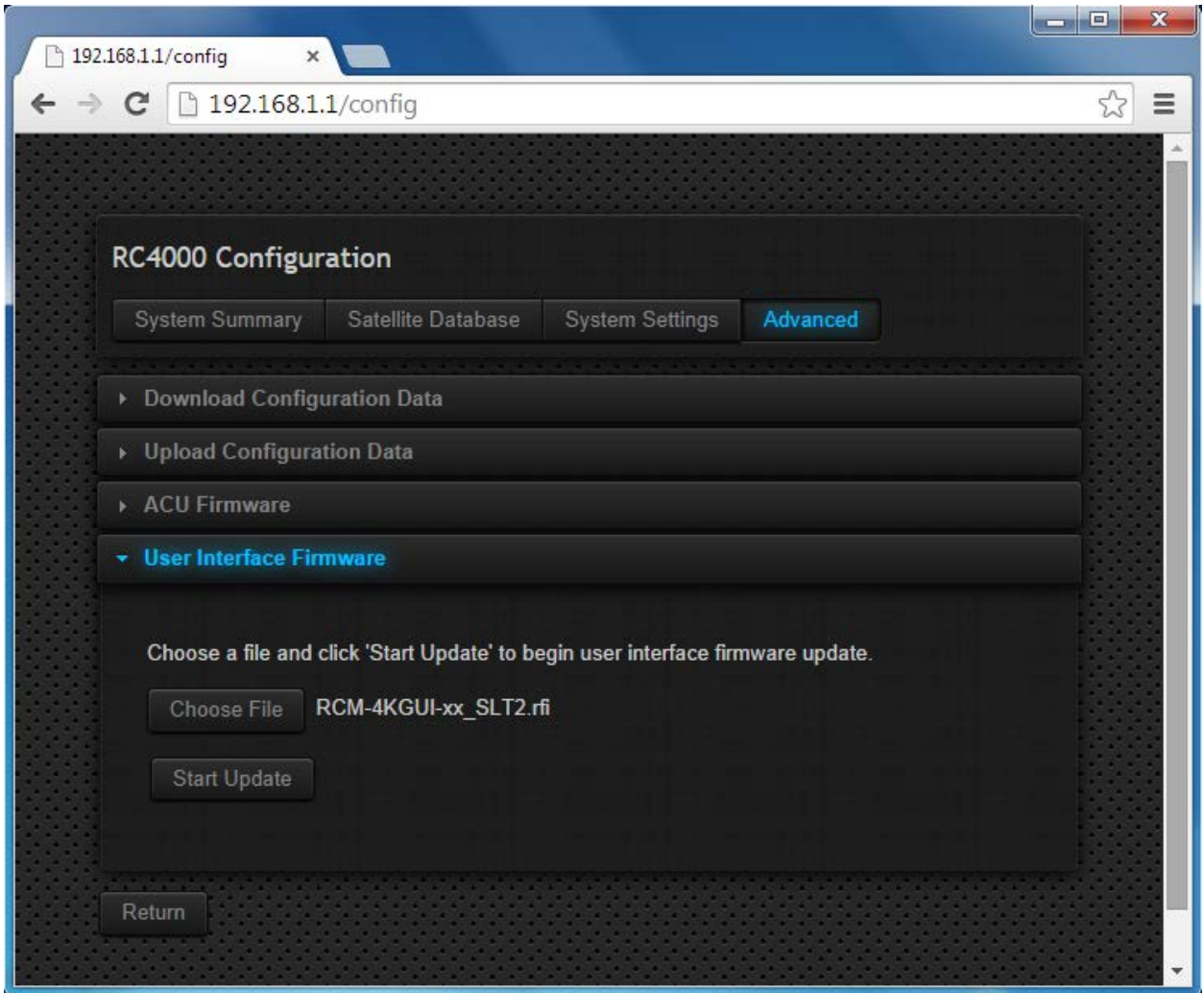


3.4.4 User Interface Firmware

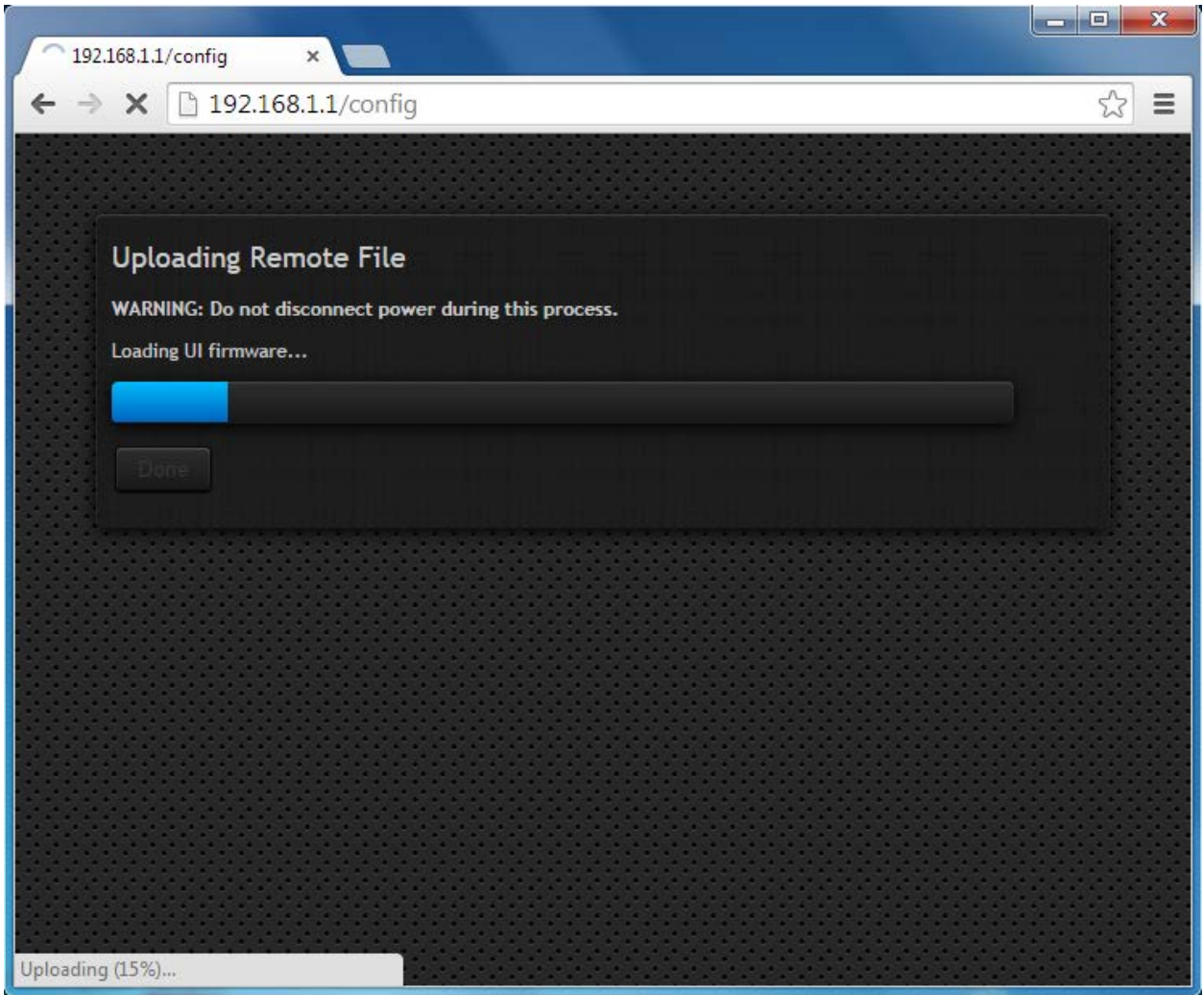
A User Interface Firmware file can be uploaded.



Press the Choose File button, select the appropriate file to be uploaded (.rfi file type). The screen should now look like the following diagram. Verify that the hex file you have chosen is the same as is shown to the right of the Choose File button.



Press the Start Upload button. The panel will change to show the status of the upload process. Once the upload is complete, press the Done button. You will see that you are directed back to the System Summary panel.



3.0 ACU Firmware Upgrade Walkthrough

This walkthrough provides step-by-step instructions to allow a typical ACU firmware upgrade to be performed successfully. Please follow ALL steps in the procedure. Skipping steps or performing out of sequence can cause an unsuccessful upgrade that may present problems later when using the ACU with an antenna.

ACU Firmware Upgrade Walkthrough

1. Go to the RC4000 Configuration page (for example, type 192.168.1.1/config into the web browser's address bar.)
2. Click on the "Advanced" tab and "Download Configuration Data", follow steps in section 2.4.1.
3. Click on the "ACU Firmware" panel. Follow the steps provided in section 2.4.3 to download the new ACU Firmware file into the ACU.

Reset System Data

4. Go to the RC4000 Remote Control Front Panel (for example, type 192.168.1.1/rcfp into the web browser's address bar.)
5. Navigate to the Reset Defaults CONFIG menu (refer to the RC4000 baseline manual for detailed information on navigating the menus in the RC4000.) A quick reminder is to hold the MODE key for about 5 seconds until the screen changes to CONFIG, make sure the Expert Access is set to Super User Mode, scroll through the CONFIG screens to the RESET DEFAULTS screen and then type the RESET DEFAULTS code.
6. After Reset Defaults has been completed, go back to the RC4000 Configuration page (192.168.1.1/config).
7. Click on the "Advanced" tab and "Upload Configuration Data". Follow the steps provided in section 2.4.2.

The firmware upgrade is now complete.

Revision History:

Rev	Date	Initials	Description
A	12/19/14	JDK	Initial release.