CCI's

SCU-AISG2-3

(Single and Triple AISG2.0 Output

Site Control Unit)

User Guide

Communication Components, Inc.

Single AISG 2.0 Output Site Control Unit (SCU) Operating Instructions

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1 Introduction

The CCI SCU (Site Control Unit) is used as an AISG device controller.   It is compatible to AISG (Antenna Interface Standards Group) type of antenna with electrical adjustment capability, and provides web interface connected via Ethernet for performing remote antenna adjustment at any location.

1.1 Product Functions

The major functions provided in the CCI SCU include:

● ASIG Antenna Adjustment/Management –

The major functions for remotely adjusting and managing antenna connecting to RET (Remote Electrical Tilt Actuator) are:

a.) Antenna electrical downtilt setting

b.) Antenna calibration

c.) Maintenance of the antenna data

● AISG TMA Adjustment –

The major functions for remotely adjusting and managing TMA are:

a.) TMA gain setting

b.) TMA mode setting

● Site Management –

Site Management is used to keep basic information of a base station site like location, contact, site name and owner etc.

● System Setting –

System Setting is used to configure operating environment of the CCI SCU for managing antenna and CCI SCU through a web interface.

● Account Management –

Account Management is used to manage and authorize accounts with different security levels for monitoring and managing antennas and CCI SCU

1.2 Product Components
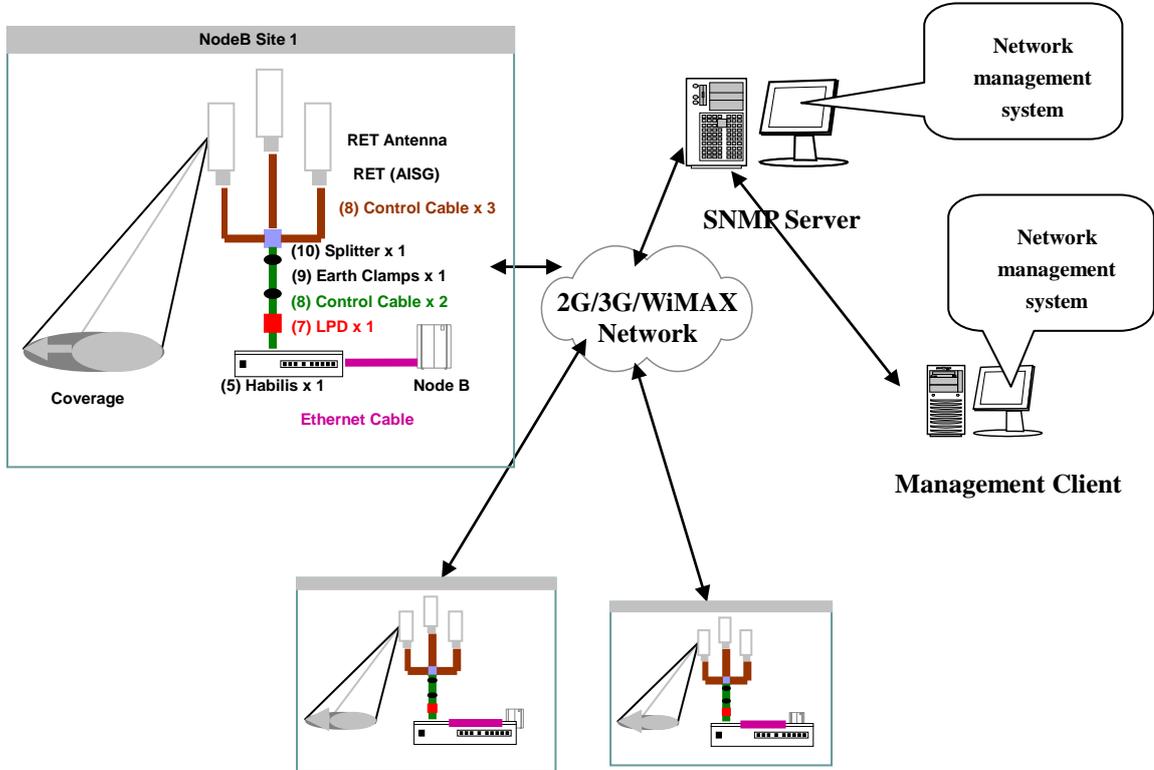
LPD: Lighting Protection Device
RET: Remote Electrical Tilt-down

Figure 1.1 Network Architecture

2 Installation

In this chapter, we will state the hardware specification, and how to setup the system. After finishing this chapter, you will be able to setup the CCI SCU.

2.1 Hardware Specification

The front panel of the CCI SCU has either one or three AISG ports (depending on the Model Number ordered), LED indicators, an RS-232 C connector and a USB 2.0 high speed serial data connector.   The AISG female port(s) is (are) used to connect to the antenna's ACTUATOR (RET) via an AISG cable for controlling electrical down tilt, or to connect to an AISG Compliant Bias-T via an AISG cable which in turn provides power and control via an RF Coaxial Cable to the input of an AISG Compliant TMA. Please note that an AISG Compliant TMA will also have an AISG connector for connection to the antenna's Actuator via an AISG cable.   The RS-232C port is used to connect a console to the SCU for direct management.   The indicators show Alarm, Run and Power Status of the CCI SCU.   The CCI SCU also has various connectors including DC Power Input, an Ethernet Port, USB 2.0 high speed serial data connector and a dry contact relay port ("Removable Terminal Block").

2.1.1 Dry Contact Alarm Relay Connector

The dry contact relay connection is made via a "Removable Terminal Block, or a DB9 connector.

Table 2-1 Dry Contact Relay Alarm Details for "Removable Terminal Block"

Dry Contact Relay Pin Name	Dry Contact Relay Pin #	Description
IN	1	N/A
O1	2	Normally Closed
O2	3	Normally Open
O3	4	Common
GND	5	N/A

Table 2-2 Dry Contact Relay Alarm Details for "DB9 Connector"

Dry Contact Relay Pin Name	Dry Contact Relay Pin #	Description
O1	1	Normally Closed
O3	2	Common
	3	No Connection
	4	No Connection
	5	No Connection
O2	6	Normally Open
	7	No Connection
	8	No Connection
	9	No Connection

2.1.2 Status Indicator Description

Status indicator and reset button description is as follows:

1. **Alarm Indicator**: [Red] LED will light up or blink when there is a warning condition.
2. **Power Indicator**: [Green] LED will light up when the power is connected.
3. **Run Indicator**: [Yellow] LED will blink when the system is running.
4. **Reset Button**: [RESET] when pressed, the CCI SCU will be restarted.

2.2 Hardware Setup

1. Connect the Ethernet port on the SCU to the BTS, or to a "Local" PC if the BTS is not ready to provide LAN Control of the SCU.
2. Connect +27VDC power to the DC input terminal block on the SCU.
3. Connect an AISG female port on the SCU to the AISG line device via AISG cable.

2.3 Web-Based Client System Requirement

Required: IE 6.0 (Internet Explorer 6.0) or above for accessing and managing the CCI SCU.

Recommended: Screen resolution of 1024 x 768 or higher

3 Login

Login to the CCI SCU to access and manage the system.   In order to login to the SCU Launch Internet Explorer and enter the IP address of the CCI SCU with "http://" as the prefix to get the following logon page as shown in Figure 3.1 below.   *Note: It is assumed that the user is familiar with the Network Connection setup in the applicable Windows Operating System.*

The default IP address is 192.168.0.30 and can be changed after login.
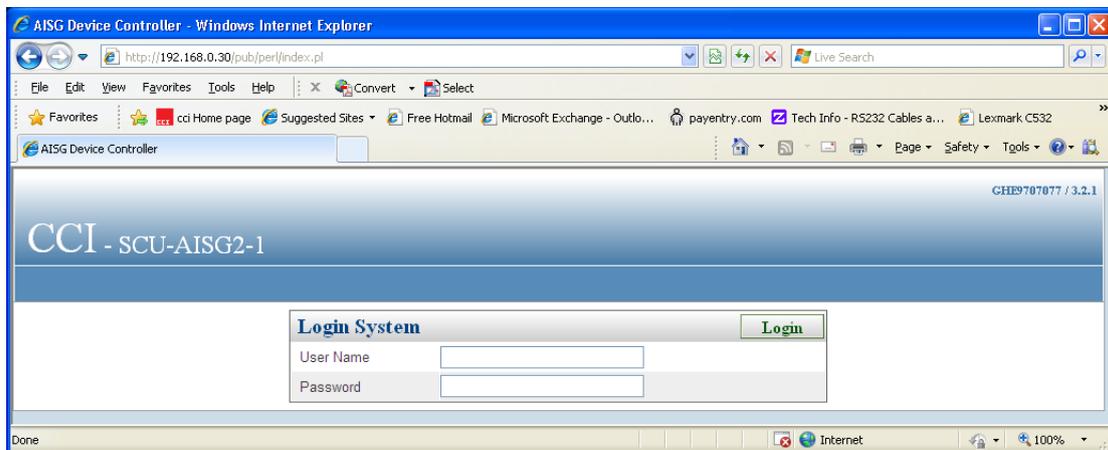
Figure 3.1 – Login Window

The default system administrator User Name is "admin," with "admin" as the default Password.   The default account has the full authority for access and management of the SCU.   It is recommended that the password of the default administration account be changed after login.   Create other accounts for general operations as required.
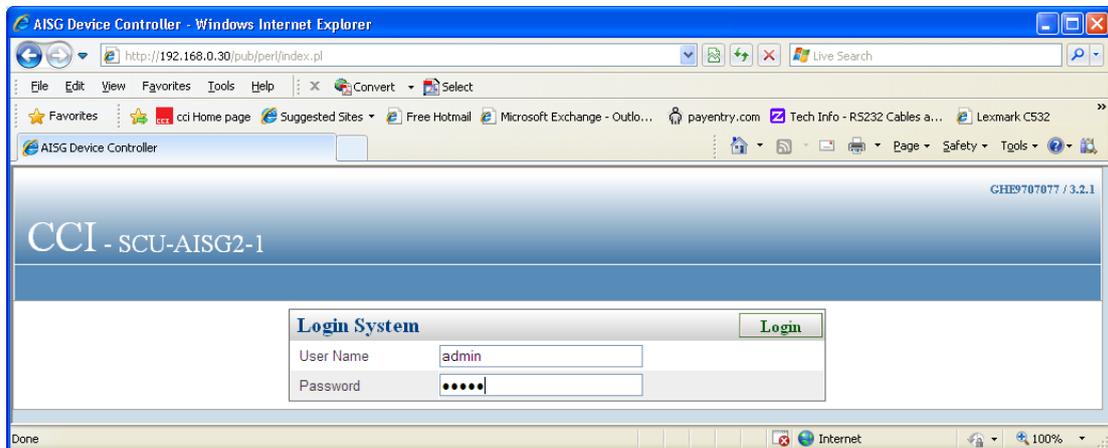
Figure 3.2 – Login Window with User Name and Password Entered

4 System Configuration

4.1 System Parameters Setting

The functionality of the [System Setting] panel is to set up system parameters for desired System operation. Click the "System Setting" Tab at the top of the AISG Device Controller window to view the System Setting window as shown in Figure 4.1.
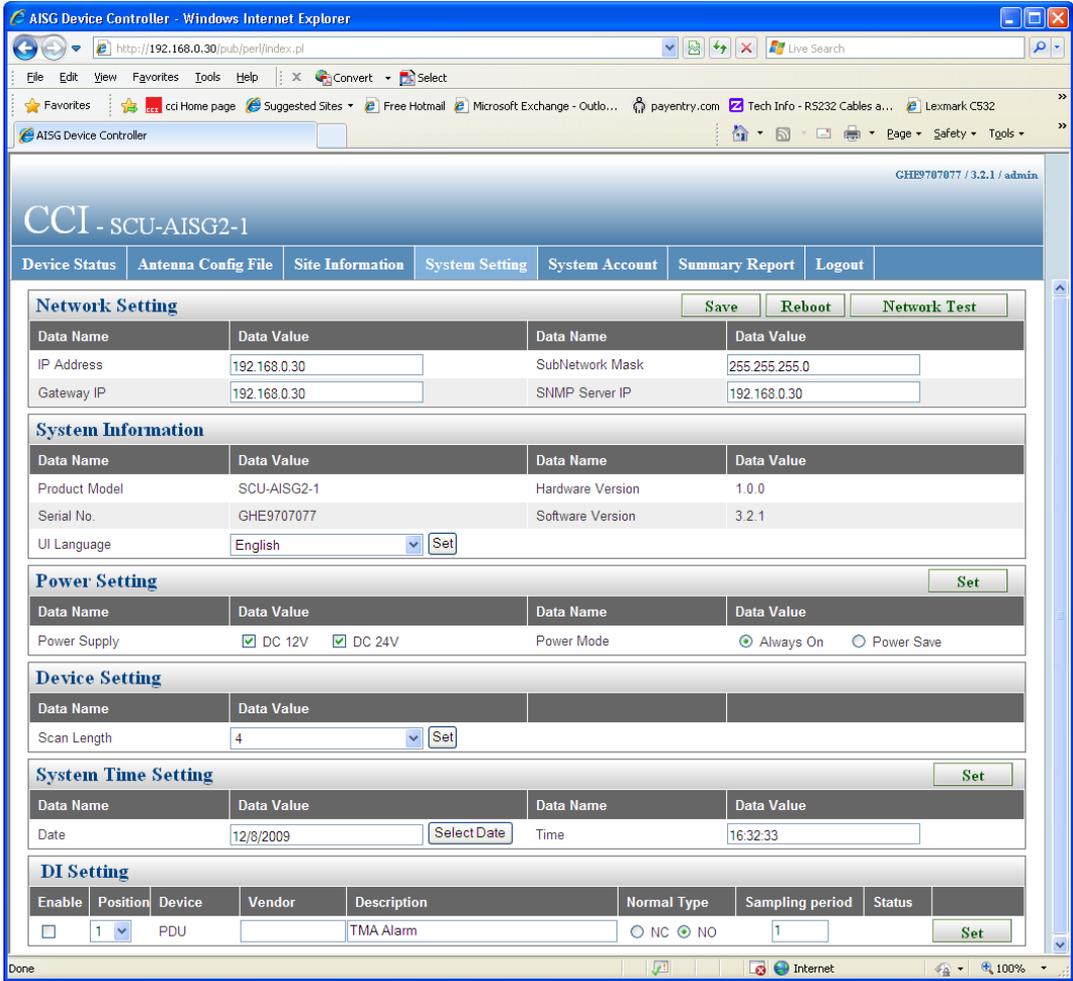
Figure 4.1 – System Setting Window

4.1.1 Network Setting

Network Setting is used to set IP address, Subnet mask setting, Default Gateway IP and SNMP server IP addresses of the CCI SCU for remotely managing the system.

The default IP address, 192.168.0.30, should be changed to the IP address assigned to the SCU in your network.

Clicking the Save button on the Network Setting portion of the display will cause the confirmation (pop-up) window to appear.
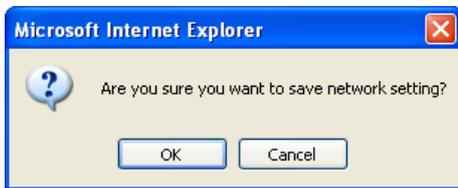
Figure 4.2 – "Save Network Setting" Confirmation Window

Click the [OK] button (see Figure 4.2) on the confirmation (pop-up) window to initiate the save process.
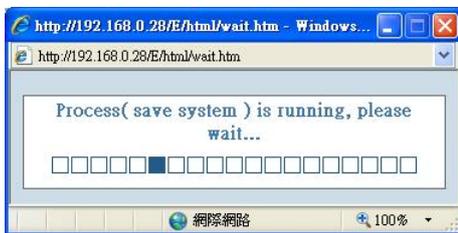
Figure 4.3 – "Save Network Setting" Process Running Window

After the process is done, click the [Close] button (see Figure 4.4) on the process (pop-up) window to close the process window.
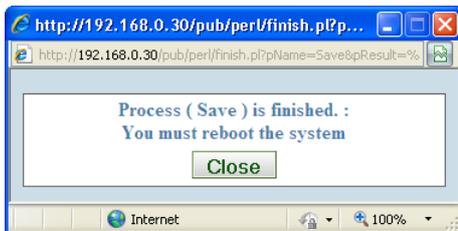
Figure 4.4 – "Save Network Setting" Process Finished Window

After saving, these parameter settings will only take effect after the CCI SCU

reboots.   Please click [Reboot] button within the Network Setting (see Figure 4.1) in order to reboot the CCI SCU at this time.

4.1.2 Reboot

The confirmation (pop-up) window (see Figure 4.5) shows when clicking the [Reboot] button in the Network Setting portion of the display to reboot the CCI SCU.

Figure 4.5 – "Reboot the System" Confirmation Window

Click the [OK] on confirmation (pop-up) window button to initiate the reboot process.
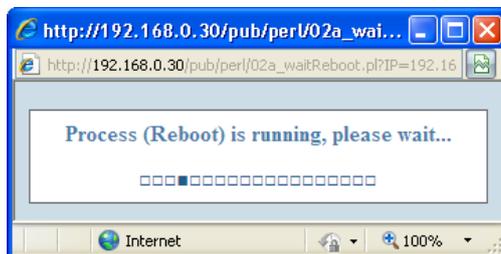
Figure 4.6 – "Reboot the System" Process Running Window

Note: No other pop-up window appears when the reboot process is completed.

4.1.3 System Information

System Information (see Figure 4.1) provides information of product model, serial no., hardware version and software version of the CCI SCU.

[UI Language] is used to change GUI language setting.   Select preferred language and click [Set] button on the System Information portion of the window to apply the [UI Language] setting.

4.1.4 Power Setting

Power Setting (see Figure 4.1) is used to set the power supply voltage and supply mode used by the connected AISG devices.

Table 4-1 – "Power Setting" ID and Data Entry Constraints or Limits

Column Name	Constraint / Limit
Power Supply	DC 12V or DC 24V The selected power is turned on if its checkbox is checked
Power Mode	If checked, the power will be continuous on; otherwise it will be on when a command is initiated

Click the [Set] button on the Power Setting portion of the window to initiate the process that applies [Power Supply] and [Power Mode] setting.   Click the [Close] button (see Figure 4.7) on the pop-up window to close the process window when the process is finished.
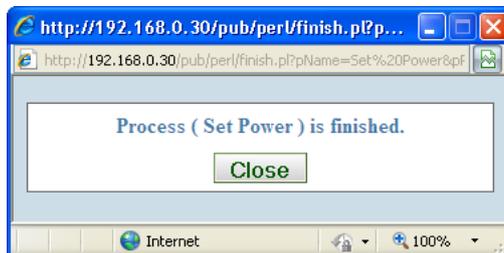
Figure 4.7 – "Set Power" Process Finished Window

4.1.5 Device Setting

The [Scan Length] value is to determine how many bit-mask bytes will be used to scan the device.   The default is 3.

Click [Set] button on the Device Setting portion of the display (see Figure 4.1) to initiate the process that apply [Scan Length] value.   Click [Close] button (see Figure 4.8) on the pop-up window to close the process window after the process is finished.
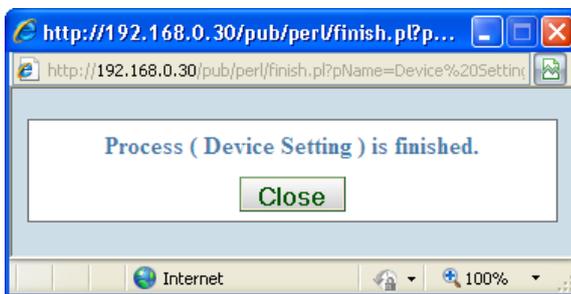
Figure 4.8 – "Device Setting" Process Finished Window

4.1.6 System Time Setting

This function is to set system date and time.   Time setting uses 24-hour format.

Click [Set] button on the System Time Setting portion of the display (see Figure 4.1) to initiate the process that apply the date and time onto the system.   Click [Close] button (see Figure 4.9) on the pop-up window to close the process window after the process is finished.
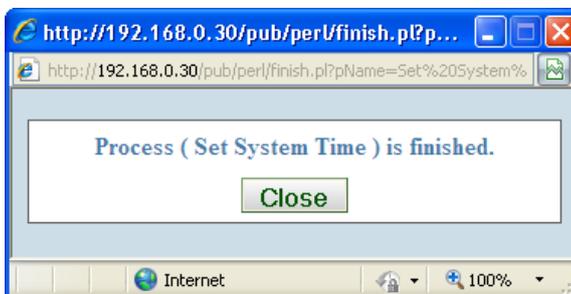
Figure 4.9 – "Set System Time" Process Finished Window

4.2 System Account Management

The functionality of [System Account] panel is to manage user accounts for accessing the CCI SCU.   Click the System Account Tab at the top of the AISG Device Controller window to view the "User List" as shown in Figure 4.10.
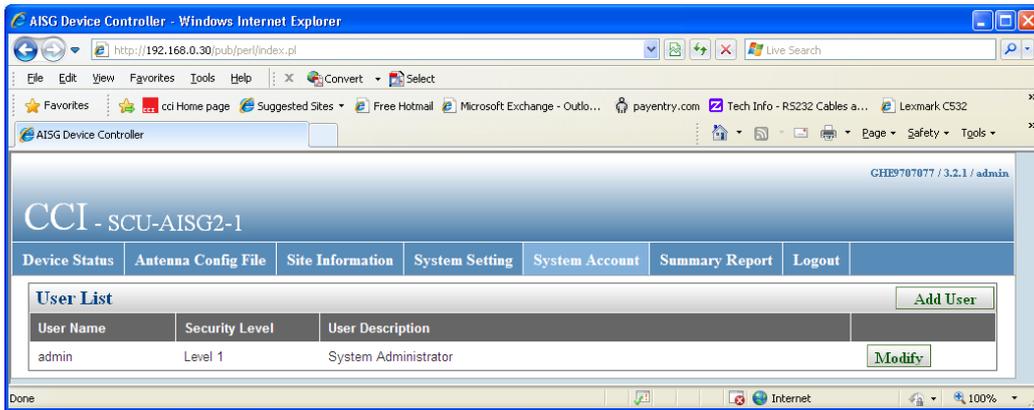
Figure 4.10 – "System Account" Main Window

The default account is "admin" and its default password is "admin".   You can modify the information for this account but you cannot delete it.

4.2.1 Add an User Account

The following (pop-up) window (see Figure 4.11) appears when clicking the [Add User] button.
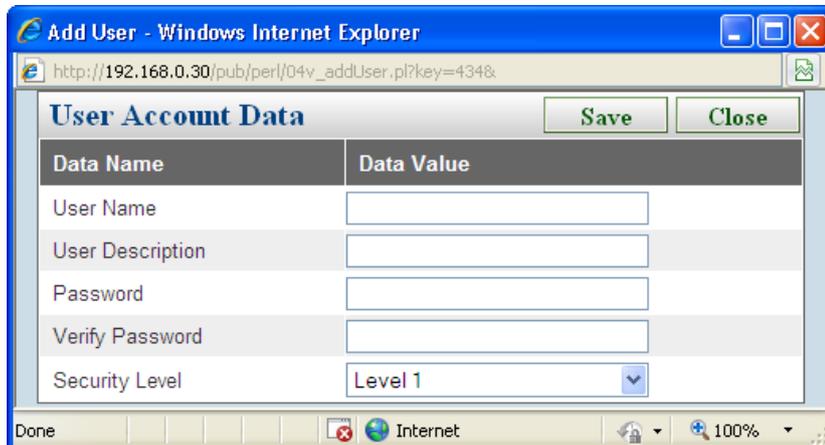
Figure 4.11 – "User Account Data" Window (after pressing "Add User")

Table 4-2 – "User Account Data" ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
User Name	Has to be unique in the CCI SCU
User Description	Description of the user
Password	Password of the user account
Verify Password	Have to be the same as the value input in [Password]
Security Level	Level 1 : Have the full authority for accessing the CCI SCU Level 2 : Allow to access [Device Status], [Site Information] and [Summary Report] panel only

The confirmation window shows after clicking [Save] button (see Figure 4.12) on the confirmation (pop-up) window for creating a new account.

Figure 4.12 – "Save This Account" Confirmation Window

Click [OK] button (see Figure 4.13) to create this account and refresh the [System Account] panel.   If the account already exists, the warning (pop-up) window will display.

Figure 4.13 – "Save This Account" Warning Window

4.2.2 Modify a User Account

[User Name] of account is not allowed to be changed and [Security Level] of the default account is not allowed to be changed.

[Password] and [Verify Password] are not required to be entered unless you want to change the existing password of an account.

The modification (pop-up) window (see Figure 4.14) displays after clicking [Modify] button on the account.
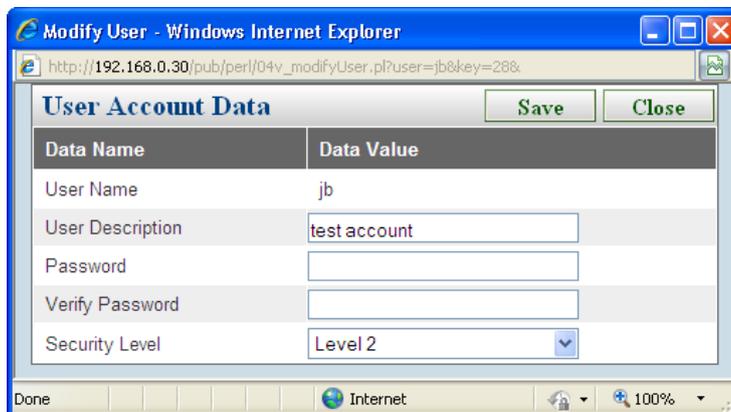
Figure 4.14 – "User Account Data" Window (after pressing "Modify User")

The confirmation window (see Figure 4.15) shows after clicking [Save] button to store changes.

Figure 4.15 – "Edit This Account" Confirmation Window

Click [OK] button on the confirmation (pop-up) window to save the change of this account and refresh the [System Account] panel.

4.2.3 Delete an User Account

The confirmation window shows after clicking [Delete] button of the account.
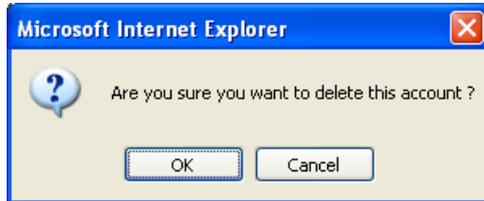
Figure 4.16 – "Delete This Account" Confirmation Window

Click [OK] button on the confirmation (pop-up) window (see Figure 4.16) to delete this account and refresh the [System Account] panel.

6 Using the CCI SCU

6.1 AISG RET/TMA Device Scan

All online RET/TMA antennas at the base station site that can be controlled remotely are listed on the [Device Status] panel.   The down tilt angel of antenna or the TMA gain can be adjusted remotely without any on-site personnel.   Click the Device Status Tab at the top of the AISG Device Controller window to view the "Device List" as shown in Figure 5.1.
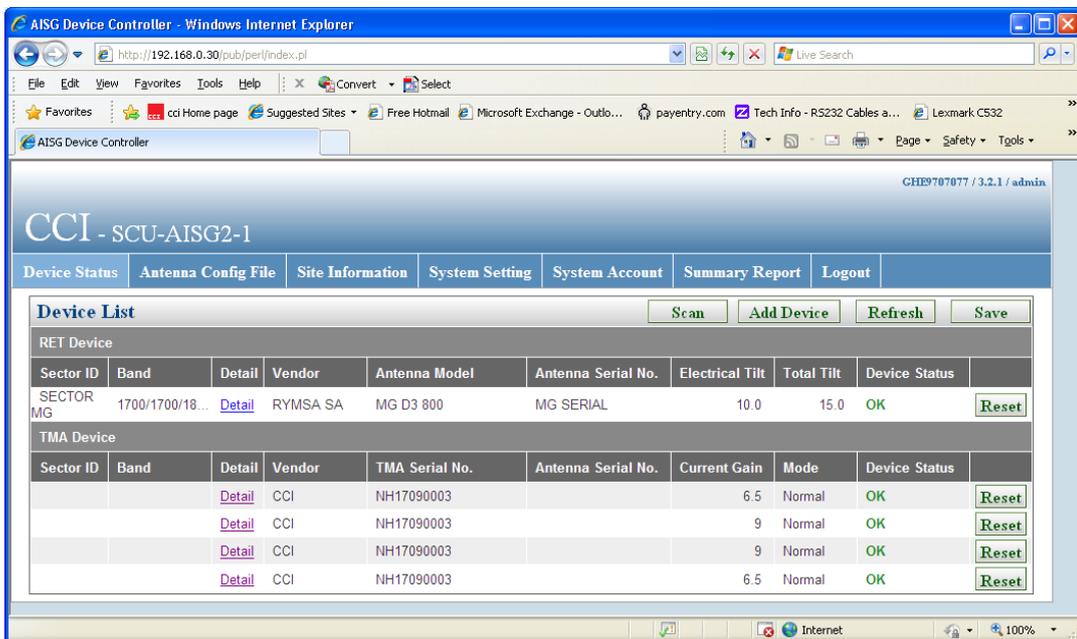
Figure 5.1 – "Device Status" Window (after performing a Scan)

In the panel, devices will be listed in the RET and/or TMA device list according to its device type.   The important device information (refer to the table below for explanation) of each device is retrieved directly from the internal storage of the CCI SCU.

Device information will be updated after any scanning, refreshing, resetting and/or adding device action.

RET Device

Table 6-1 – "RET Device" ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
Sector ID	Sector ID
Band	Current applied frequency band(s)
Detail	A link for Antenna (RET) adjustment function
Vender	Vendor name
Antenna Model	Antenna model no.
Antenna Serial No.	Antenna serial no.
Electrical Tilt	Current electrical down tilt value
Total tilt	Sum of mechanical tilt and electrical tilt
Device Status	It can be "OK" or device alarm messages

TMA Device

Table 6-2 – "TMA Device" ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
Sector ID	Sector ID
Band	Current applied band(s)
Detail	A link for TMA adjustment function
Vender	Vendor name
Antenna Model	Antenna model no.
Antenna Serial No.	Antenna serial no.
Current Gain	Current gain value
Mode	TMA gain mode can be "Bypass" or "Normal".
Device Status	It can be "OK" or device alarm messages.

2.1.1 Scan

This function is to scan for current connected AISG devices and display them on the device list.   The confirmation (pop-up) window (see Figure 5.2) shows after clicking [Scan] button.
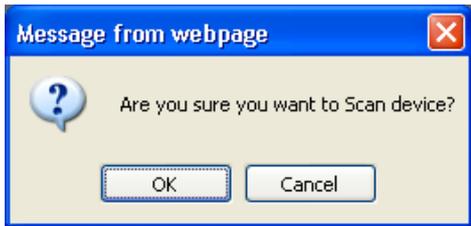
Figure 5.2 – "Scan Device" Confirmation Window

Click [OK] button on the confirmation (pop-up) window (see Figure 5.3) to initiate the process.
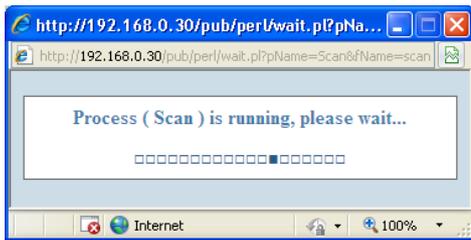
Figure 5.3 – "Scan" Process Running Window

The [Device Status] panel will be updated after the process is finished.   Click [Close] button on the process (pop-up) window (see Figure 5.4) to close the process window.
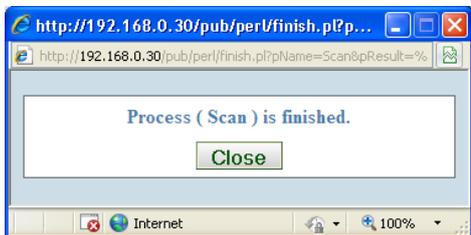
Figure 5.4 – "Scan" Process Finished Window

You have to save scanned information via the [Save] button before navigating to other web pages; otherwise this information won't be saved in the CCI SCU.

If clicking [Detail] or another tab before saving, the confirmation (pop-up) window (see Figure 5.5) shows.

Figure 5.5 – "Device Data Not Saved; Save Device Data?" Window

Click [OK] button on the confirmation (pop-up) window to save device information, prior to navigating to another web page.

2.1.2 Add a Device

This function is to add a specific device into the CCI SCU if a device cannot be found through scan process or you would like to add it manually.

The input window (see Figure 5.6) shows after clicking [Add Device] button in the "Device List" window shown in Figure 5.1.   Entry of the [Vendor Code] is optional.

Figure 5.6 – "Add Device" Pop-up Window

Click [Add] button in the process (pop-up) window (see Figure 5.7) to initiate the process.
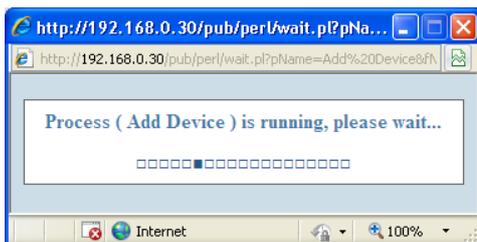
Figure 5.7 – "Add Device" Process Running Window

When the add process is finished, it will refresh the [Device Status] panel and automatically go back to the [Device Status] panel.

You have to save the added device information via [Save] button before navigating to other web pages; otherwise the device information won't be saved in the CCI SCU.

If clicking [Detail] or another tab before saving, the confirmation (pop-up) window (see Figure 5.8) shows.

Figure 5.8 – "Device Data Not Saved; Save Device Data?" Window After Performance of "Add Device"

Click [OK] button on the confirmation (pop-up) window (see Figure 5.8) to save device information, prior to navigating to another web page.

2.1.3 Refresh

This function is to get the latest device information of devices on the device list.

Click [Refresh] button in the "Device List" window shown in Figure 5.1 to initiate the process (see Figure 5.9).
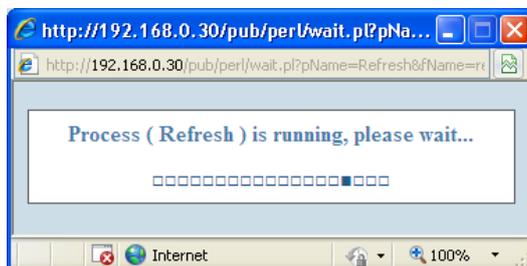
Figure 5.9 – "Refresh" Process Running Window

The [Device Status] panel is refreshed when the process is finished.   Click [Close] button (see Figure 5.10) in the process (pop-up) window to close the process window.
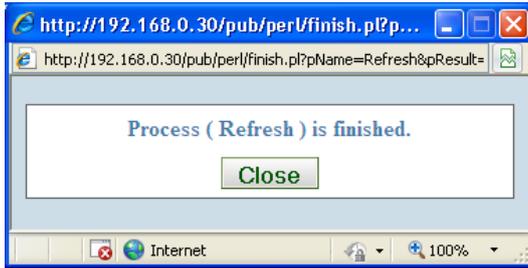
Figure 5.10 – "Refresh" Process Finished Window

2.1.4 Save

This function is to save device information updated into the storage of the CCI SCU.

Click [Save] button to initiate the process in the "Device List" window shown in Figure 5.1.
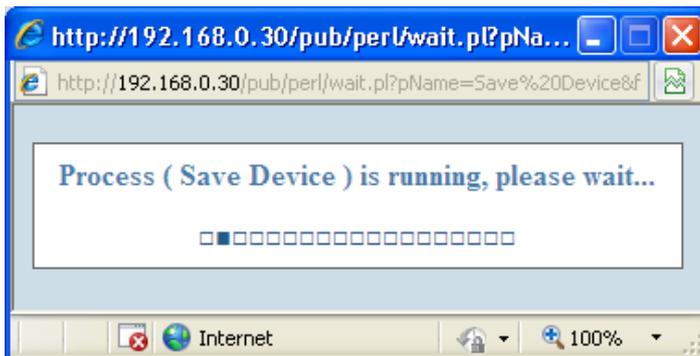
Figure 5.11 – "Save Device" Process Running Window

After the process is done, click [Close] button (see Figure 5.12) in the process (pop-up) window to close the process window.

Figure 5.12 – "Save Device" Process Finished Window

2.1.5 Reset

This function is to reset device software and get the latest device information.

Click [Reset] button in the "Device List" window shown in Figure 5.1 to initiate the reset process of the device.
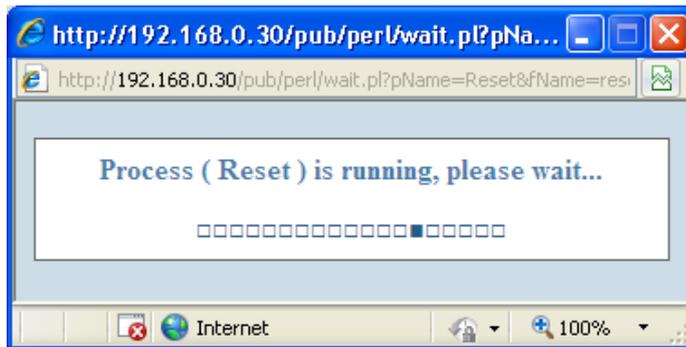
Figure 5.13 – "Reset" Process Running Window

After the process is done, click [Close] button (see Figure 5.14) in the process (pop-up) window to close the process window.
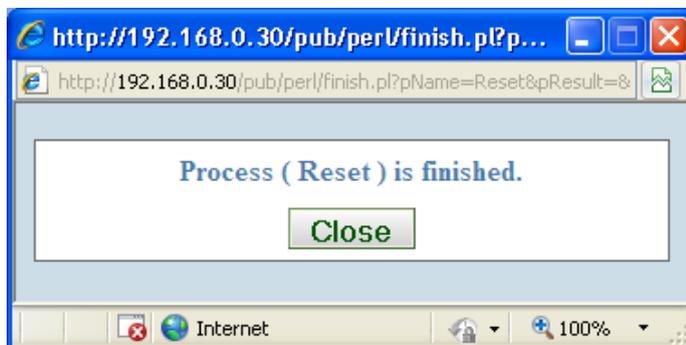
Figure 5.14 – "Reset" Process Finished Window
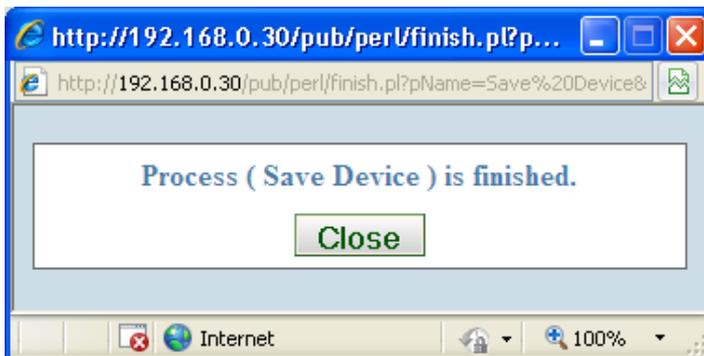
6.2 AISG RET/TMA Adjustment

The RET/TMA adjustment page displays after clicking [Detail] of a RET/TMA device from the "Device List" as shown in Figure 5.1 on the [Device Status] panel.

More detailed information of the antenna, and the RET or the TMA are displayed. This information can be changed and stored into the storage of the CCI SCU.   Some of the information is preloaded by the device itself, other information requires "User" data entry and yet other items require that they be "set."
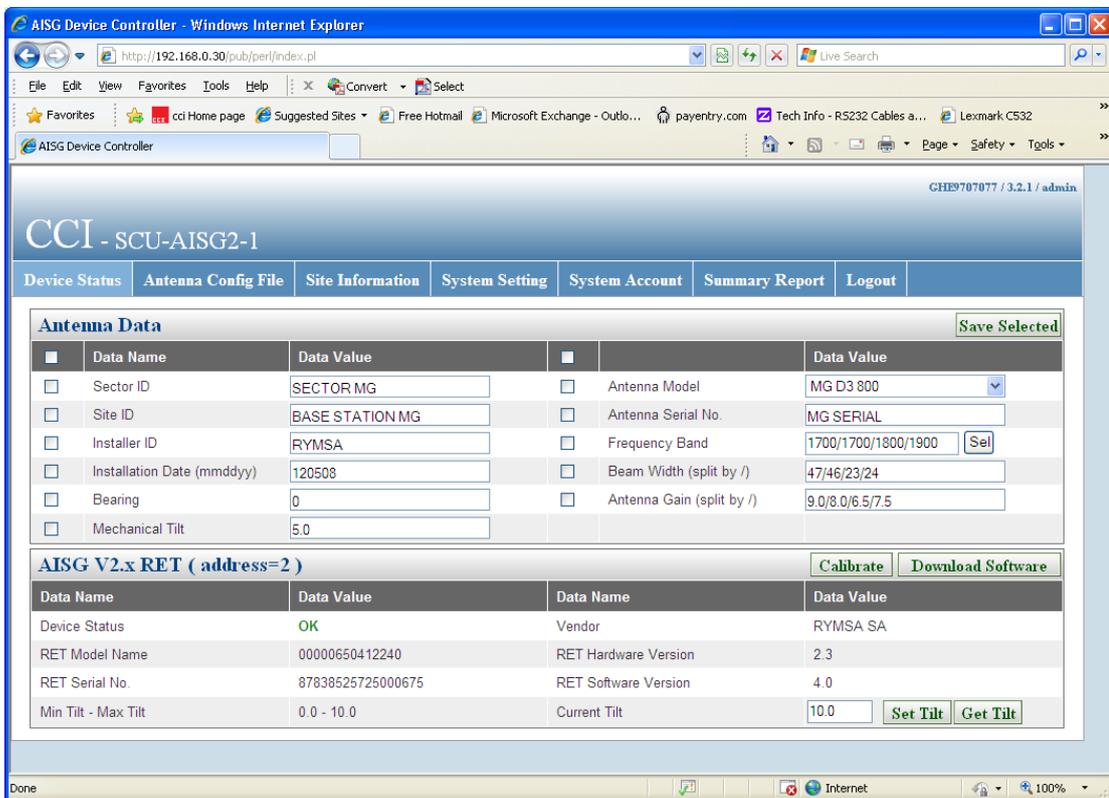
Figure 5.15 - RET Device Detail Window (Shows Antenna & AISG V2.x RET Device Data)
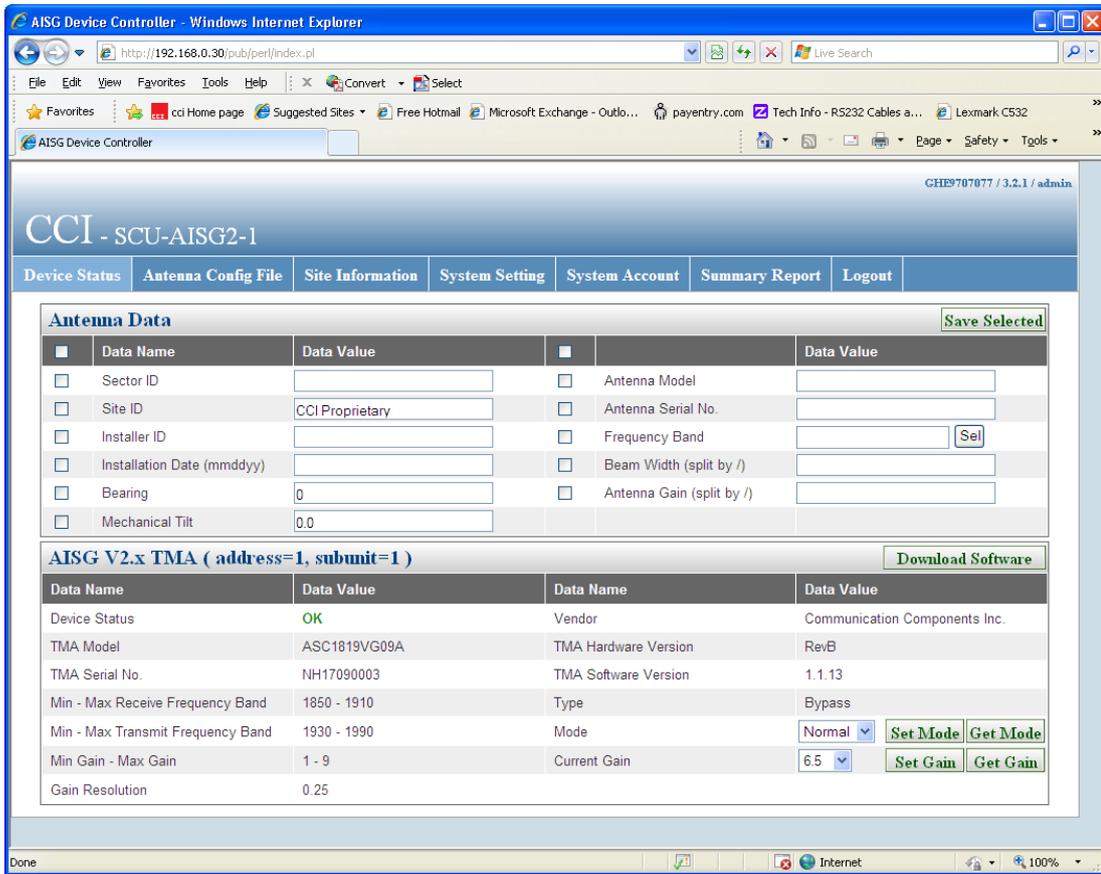
Figure 5.16 - TMA Device Detail Window (Shows Antenna & AISG V2.x TMA Device Data)

2.2.1 Antenna Data

The following table describes the antenna information displayed on the Detail. You can update any changed information into the storage of the CCI SCU.

Antenna Data

Table 6-3 – "Antenna Data" ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
Sector ID	Sector ID
Site ID	Base station site ID
Installer's ID	Installer's ID
Installation Date	mmddyy format
Bearing	Antenna bearing in the range of 0-359 degree
Mechanical tilt	Installed mechanical tilt in degree
Antenna Model	If you cannot find a proper antenna model for the RET, please refer "Antenna Configuration File" for how to add your antenna model.
Antenna Serial No.	Antenna serial no.
Frequency Band	Frequency band(s) used by the antenna
Beam Width	Beamwidth for each band in frequency order. Split by /
Antenna Gain	Gain for each band in frequency order. Spit by /

Click [Save Selected] button to initiate the process for storing data value(s) with the checkbox checked (as shown in the red block below).

Figure 5.17

Figure 5.18 – "Save Selected" Process Running Window

After the process is finished, click [Close] button to close the process window.

Figure 5.19 – "Save Selected" Process Finished Window
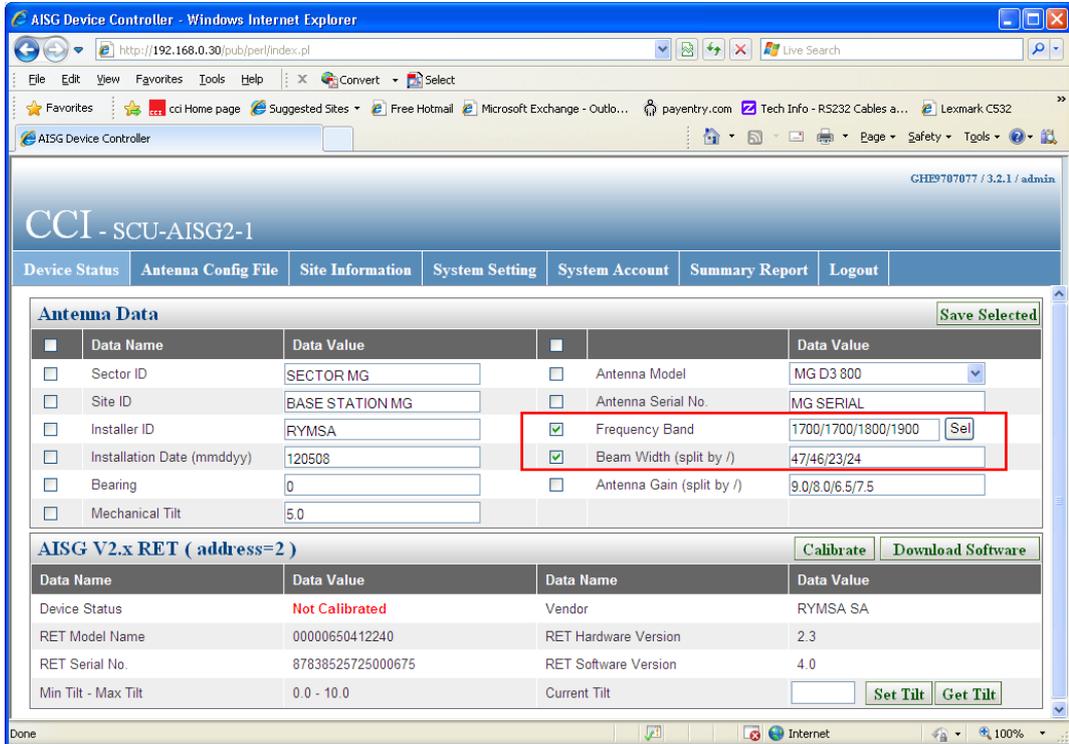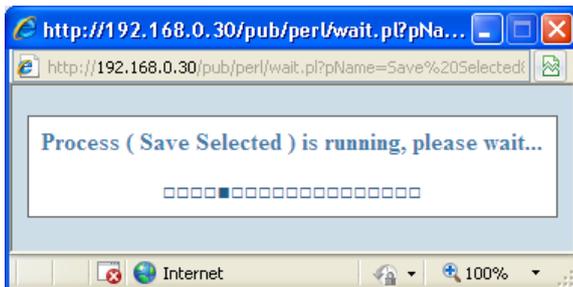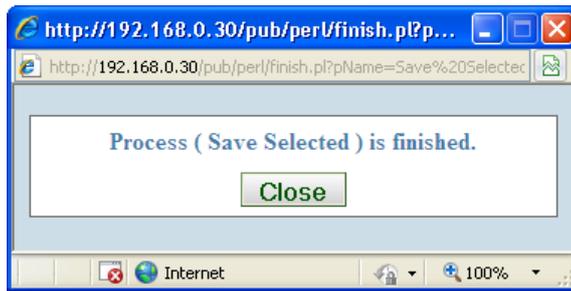
2.2.2 RET Data & Tilt Adjustment

In this section, it will cover functionalities of RET calibration and tilt value adjustment.   The following table describes the RET information displayed on the Detail.

AISG V1.x RET (or AISG V2.x RET)

Table 6-4 - AISG V1.x RET (or AISG V2.x RET) ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
Device Status	It can be "OK" or device alarm messages
RET Model Name	RET model name
RET Serial No.	RET serial no.
Vender	Vender name
RET Hardware Version	RET hardware version
RET Software Version	RET software version
Min Tilt - Max Tilt	Allowed electrical down tilt range of the selected antenna model
Current Tilt	Tilt setting should be in the range of [Min Tilt - Max Tilt].

🔘 **Calibrate**

This function is to do calibration between the RET device and the antenna.

The confirmation window shows after clicking [Calibrate] button.

Figure 5.20 – "RET Calibration" Confirmation Window

Click [OK] button to initiate the process.

Figure 5.21 – "RET Calibration" Process Running Window

After the process is done, click [Close] button to close the process window.

Figure 5.22 – "RET Calibration" Process Finished Window

Set Tilt

This function is to change the electrical down tilt angle of the antenna.

The confirmation window shows when clicking [Set Tilt] button for applying a down tilt value entered in the [Current Tilt].

Figure 5.23 – "Set Tilt" Confirmation Window

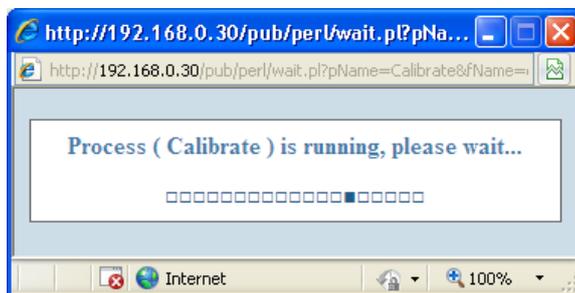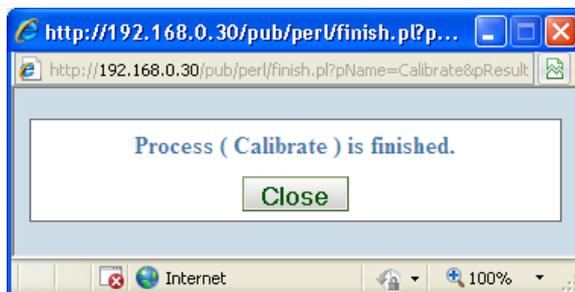Click [OK] button to initiate the process of changing down tilt angle.

Figure 5.24 – "SET Tilt" Process Running Window

After the process is done, click [Close] button to close the process window.

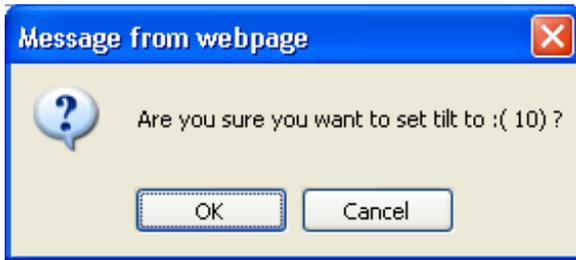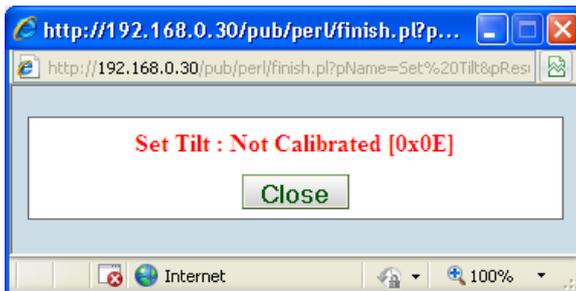**Figure 5.25 – "SET Tilt" Process Finished Window**

◉ **Get Tilt**

This function is to get the current down tilt angle of the antenna.

After clicking [Get Tilt] button, the current down tilt value shows in a popup window.

Figure 5.26 – Tilt Setting Value Window (Value shown in "Script" Window)

2.2.3 TMA Data & TMA Adjustment

In this section, it will cover functionalities of TMA mode and gain adjustment. The following table describes the TMA information displayed on the Detail.

AISG V1.x TMA (or AISG V2.x TMA)

Table 6-5 - AISG V1.x TMA (or AISG V2.x TMA) ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
Device Status	It can be "OK" or device alarm messages
TMA Model Name	TMA model name
TMA Serial No.	TMA serial no.
Vender	Vender name
TMA Hardware Version	TMA hardware version
TMA Software Version	TMA software version
Min - Max Receive Frequency Band	Allowed receive frequency band range
Min - Max Transmit Frequency Band	Allowed transmit frequency band range
Min Gain - Max Gain	Allowed gain range of the TMA model
Gain Resolution	An gain increment from min gain to max gain; For fixed gain or non-linear gain TMA, this value is always zero
Type	It's TMA type that can be "Bypass" and/or "VSWR"
Mode	TMA mode can be "Bypass" or "Normal"
Current Gain	The value should be in the range of [Min Gain - Max Gain].

🔘 **Set Mode**

This function is to set the TMA mode that can be Bypass or Normal.

The confirmation window shows when clicking [Set Mode] button for applying a mode selected in the [Mode].
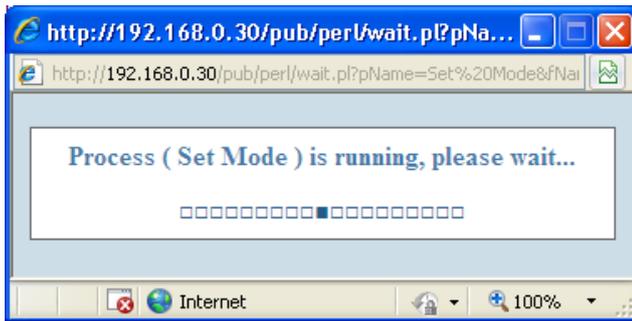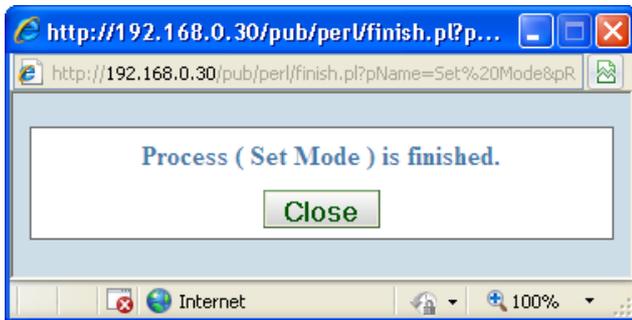
Figure 5.27 – "Set Mode to: Bypass)" Confirmation Window for TMA

Click [OK] button to initiate the process of changing TMA mode.

Figure 5.28 – "Set Mode" Process Running Window for TMA

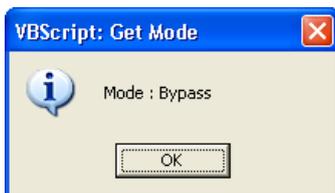After the process is done, click [Close] button to close the process window.

Figure 5.29 – "Set Mode" Process Finished Window for TMA

- **Get Mode**

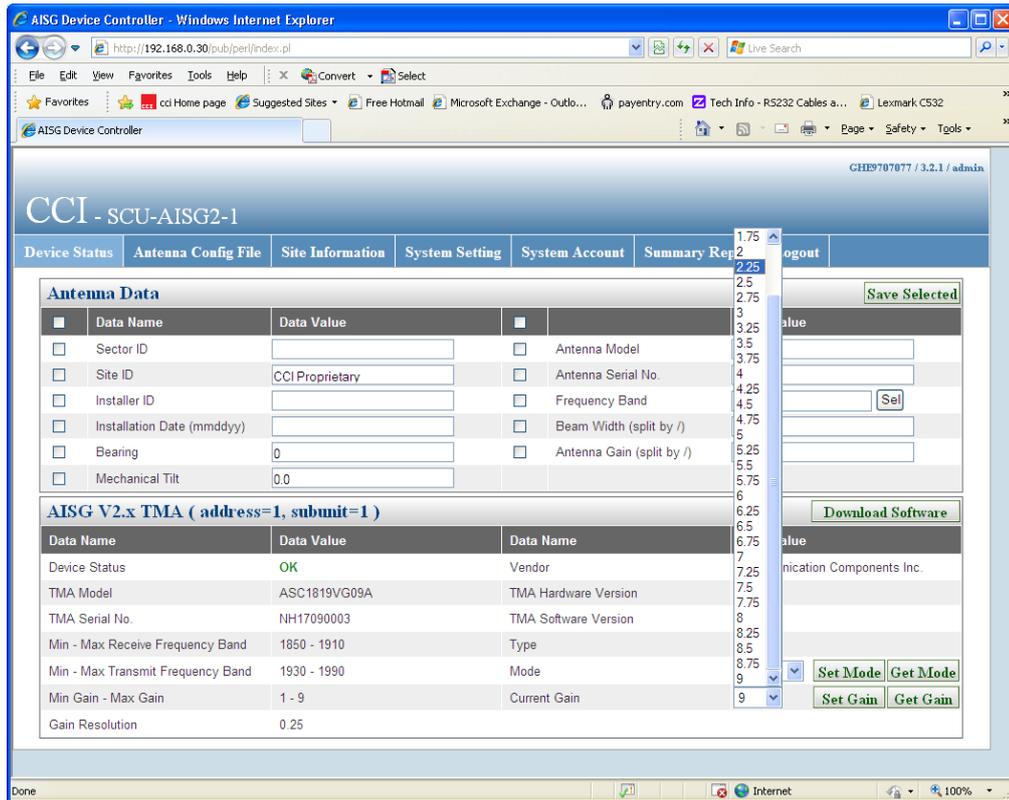 This function is to get the current TMA mode.

  After clicking [Get Mode] button, the current TMA mode setting shows in a popup window.

Figure 5.30 – Mode Value Window (Value shown in "Script" Window)

◉ Set Gain

This function is to set the TMA gain that has to be between min gain and max gain. The gain may be selected in 0.25 dB increments from the pull-down menu as shown in Figure 5.31 below.

Figure 5.31 – Gain Values Available in "Pull-Down" Menu within the Device Status Window

The confirmation window shows when clicking [Set Gain] button for applying a gain value entered in the [Current Gain].
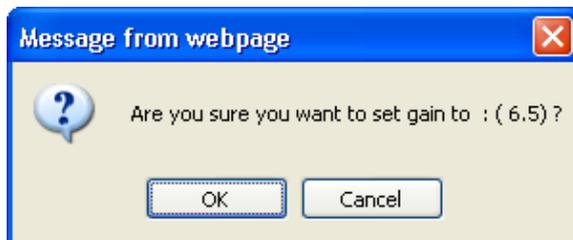
Figure 5.32 – "Set Gain" Confirmation Window for TMA

Click [OK] button to initiate the process of changing TMA gain.

Figure 5.33 – "Set Gain" Process Running Window for TMA

Figure 5.34 – "Set Gain" Process Finished Window for TMA

Get Gain

This function is to get the current TMA gain value.

After clicking [Get Gain] button, the current TMA gain value shows in a popup window.

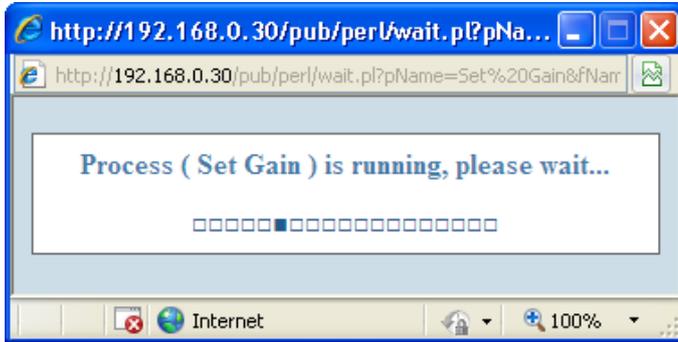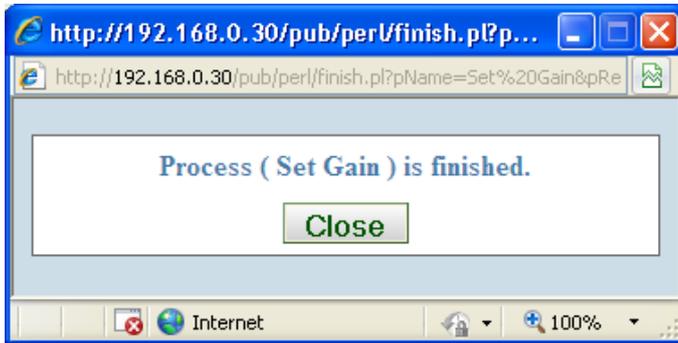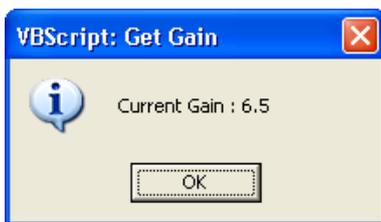**Figure 5.35 – Current Gain Setting Value Window (Value shown in "Script" Window)**

Site Information

The [Site Information] panel allows a user or an on-site engineer to fill in and save the site information for reference.
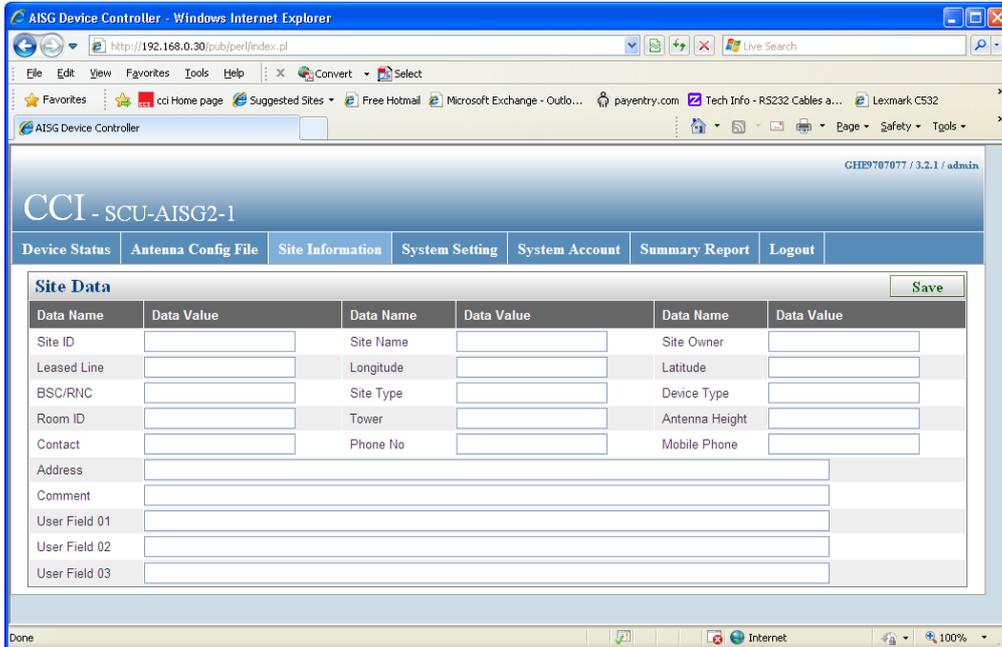
Figure 5.36 – Site Information Window

After filling in site data, click [Save] to initiate the process for storing information in the CCI SCU.

Figure 5.37 – "Save Site Info" Process Running Window

After the process is done, click [Close] button to close the process window.
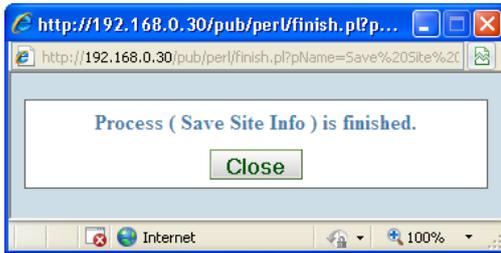
Figure 5.38 – "Save Site Info" Process Finished Window

6.3 Summary Report

The [Summary Report] panel will display the summary information of the CCI SCU and provides the downloading function of the system summary report and the system access history.
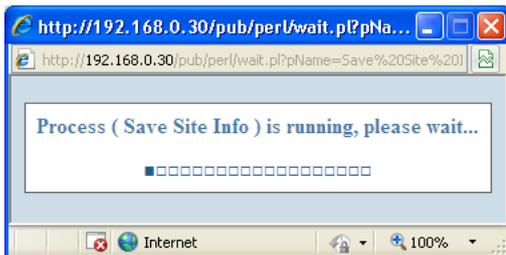
The summary report includes all detailed information of each device, the site information, the network setting information and the system information.
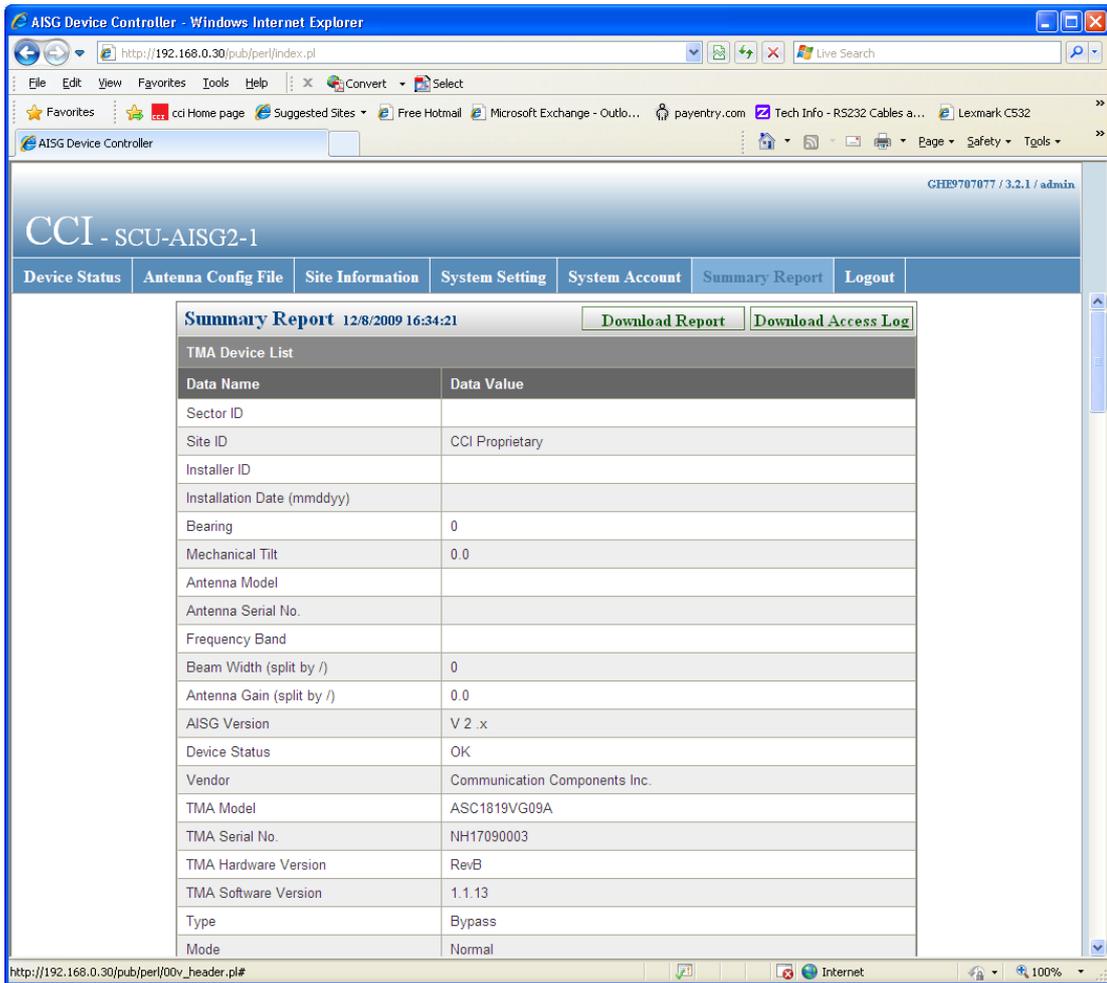
Figure 5.39 – "Summary Report" Window

Click [Download Report] button to store the information on the [Summary Report] panel into the SummaryReport.html.

Click [Download Access Log] to download access history into the AccessLog.txt that records what action was took, when an action was took, and who took the action.

7 Antenna Configuration File

The functionality of the [Antenna Config File] panel is to manage antenna configuration files of the CCI SCU.

An antenna configuration file is to provide configuration data used to configure the RET and a connected antenna of a specific antenna model.
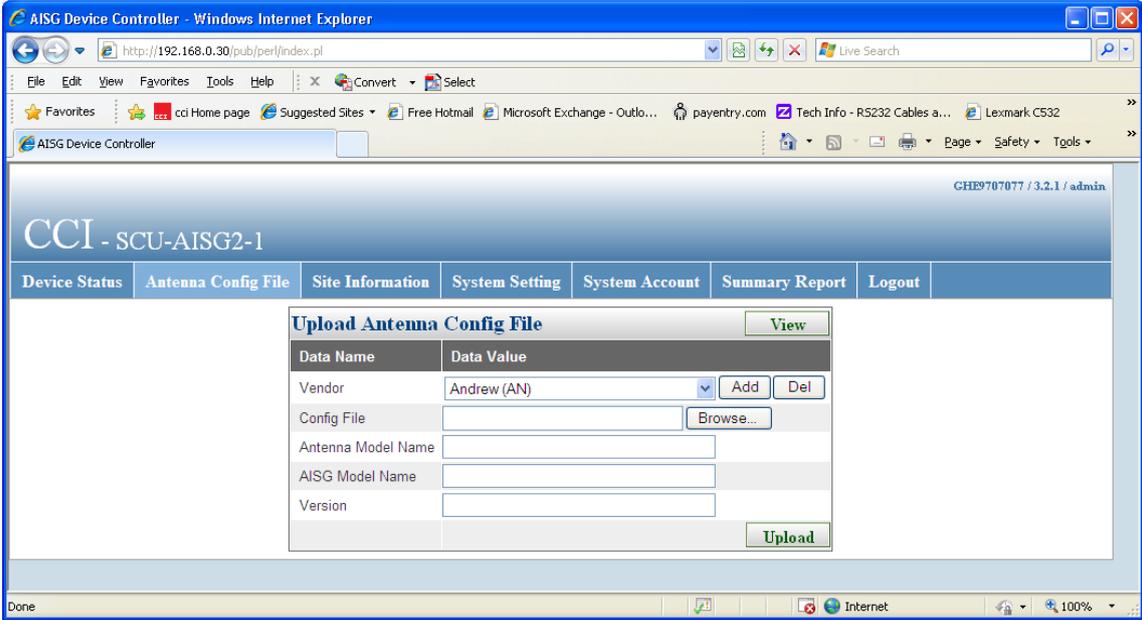

Figure 6.1 – Antenna Configuration Window

7.1 Vendor Management

2.1.1 Add a Vendor

The vendor must exist in the [Vendor] list prior to its antenna model configuration files uploading.   This function is to add a vendor for storing its antenna model configuration files.

The following window displays after clicking [Add] button.
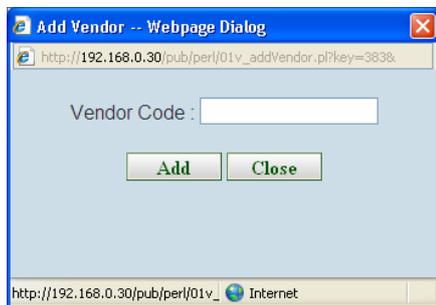
Figure 6.2 – "Add Vendor" Pop-up window

Click [Add] button to initiate the process window for adding the vendor code into the system and refreshing the [Vendor] list on the [Antenna Config File] panel.

After the process is finished, click [Close] button to close the process window.
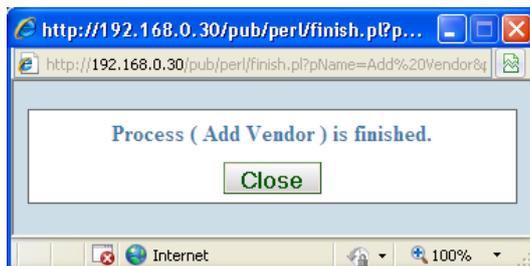
Figure 6.3 – "Add Vendor" Process Finished Window

2.1.2 Delete a Vendor

This function is to remove the vendor.   Before deleting a vendor, you have to make sure there is no any model exists under this vendor.

Select the vendor that would like to be deleted from the [Vendor], then click [Delete] button.   The confirmation window displays.

Figure 6.4 – "Delete Vendor" Confirmation Window

Click [OK] button to delete the selected vendor from the system and refresh the [Vendor] list on the [Antenna Config File] panel.

If there is a model under the selected vendor, the following warning message shows up and the vendor won't be deleted.

Figure 6.5 – "Delete Vendor Failed" Warning Window (Models must be Empty First)

## 7.2 Antenna Model Management

2.2.1 Add an Antenna Model

The vendor must exist in the [Vendor] list before its antenna models can be uploaded.   This function is to upload a model's configuration file of the selected vendor into the CCI SCU.   Refer the following table for detail information of each input field.

Table 7-1 – Antenna Value ID and Data Entry Constraints or Limits

Column Name	Description / Constraint
Vendor	Vendor name
Config File	Filename with its full path should be provided. Only a file with extension of .bin or .acf is allowed. File Size has to be less than 0.5K
Model Name	The configuration filename will be used as the default model name that is allowed to be changed. The max. length of a model name is 15.
Version	The antenna model version (Optional)

Click [Upload] button after filling in all required information.   The confirmation window shows with entered information.

Figure 6.6 – "Antenna Config File Upload" Confirmation Window

Click [OK] button to initiate the upload process.   When the process is finished, click [Close] to close the process window.
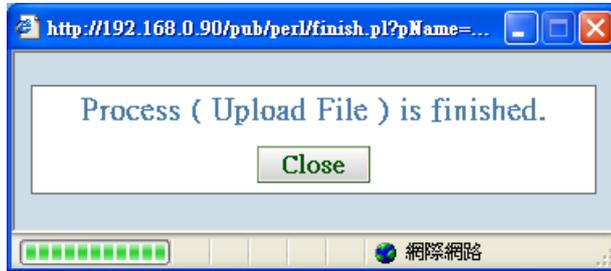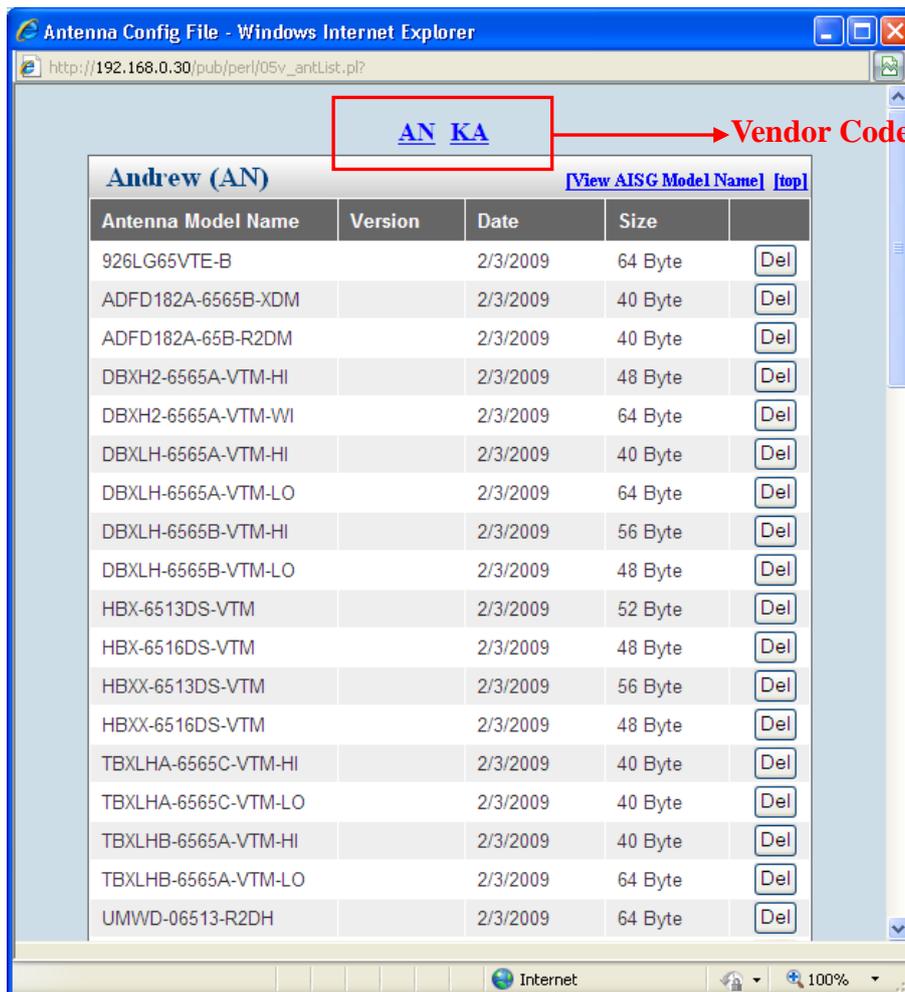

Figure 6.7 - "Antenna Config File Upload" Process Finished Window

2.2.2 Delete an Antenna Model

This function is to delete an antenna model of a specific vendor out of the CCI SCU.

Click [View] button to bring up the whole antenna model list of each vendor in the CCI SCU.

Figure 6.8 – Antenna Config Details Window (Available Vendor Codes Listed at Top)

Clicking the vendor code on the top of the page (as shown in red block above) will jump to the antenna model list of the selected vendor.

Click [Del] button on the selected antenna model of the selected vendor to delete the selected antenna model from the system.

SCU

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