



Z4550 Radio Configuration and Activation

Tech Note – TN[032]
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Applicability

All model 4550 SkyRouters

Background Information

Previous models of Ctek's SkyRouter were designed and configured to operate on a single carrier's network, or in the case of UMTS/HSPA models on a prescribed set of frequencies. Unlike these earlier models, the Ctek 4550 contains a multi-carrier, software defined radio that must be configured for proper operation on a specific network. Configuring the 4550 for network operation consists of three discrete evolutions, loading a firmware image, configuring and saving the installed radio firmware image, and activating the SkyRouter on a specific network.

The 4550 provides four areas that contain network specific radio firmware and store configuration information, specifically APN selection and the default WAN connection status. The designated areas are assigned as:

1. AT&T
2. Verizon
3. Sprint
4. Generic

The generic area is designed to accommodate most of the legacy GSM carriers and can actually contain numerous generic carrier configurations, each identified by the combination of the Country Code and Carrier Code portions of the unit's IMEI.

Factory Default Settings

The 4550 leaves the factory with Sprint firmware loaded in the radio module, the default Sprint Internet APN selected, and the WAN configured to the enabled state.

Loading a Radio Firmware Image

Note: Before loading a radio firmware module you **MUST** remove any SIM card inserted in the SkyRouter and then perform a restart. Any changes made to the radio configuration will be automatically saved in designated network area identified by the IMEI found on an installed SIM card.

Note: The firmware image currently installed in the radio can be confirmed on the Radio Firmware screen under the top-level Provisioning category as shown in Figure 1 below.

Radio Firmware Programming

Radio Firmware Update

To begin the radio firmware update process, select from the options below and put the device in Radio Update Mode.

This operation **CANNOT** be cancelled after it has been initiated.

Current Firmware:

Sprint - SWI9X15C_05.05.63.01

Select a Network:

Select One ...
Select One ...
AT&T - SWI9X15C_05.05.58.00_ATT_005.026_000
Verizon - SWI9X15C_05.05.58.01_Verizon_005.029_000
Sprint - SWI9X15C_05.05.63.01_Sprint_005.035_000
Generic - SWI9X15C_05.05.58.00_Generic_005.025_000

Back

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To load a radio firmware image perform the following steps:

1. Verify that no SIM is installed in the SkyRouter
2. Select the image to be loaded on the Radio Firmware Update screen
3. Press the Start Update button
4. Done

Note – Loading a radio firmware image can take two to three minutes

Configure the Radio Firmware and Performing Network Activation

This portion of the process will require a SIM card for the network being configured. The steps to be performed differ somewhat between legacy CDMA carriers and legacy GSM carriers because in the legacy CDMA case the APNs to be used are downloaded from the network at activation time and are, in some cases specific to the type of network service being provisioned.

As previously explained, the area assigned for saving wireless configuration settings, i.e. APN and Connection state is determined by components of the IMEI found on the SIM card. Therefore, the configuration portion of this process requires that a SIM card issued by a carrier matching the currently loaded radio firmware image **must** be installed to insure that configuration changes are saved in the area associated with the installed firmware image.

Configuring and Saving the Installed Image on Legacy GSM Carrier Networks

[For the purposes of this document, a legacy GSM carrier is AT&T, or any other carrier except Sprint and Verizon Wireless]

Procedure

1. Install a SIM card matching the current network firmware image.
2. Power up SkyRouter.
3. On the wireless configuration screen verify that the correct APN is selected.

Ctek Series 4550 SkyRouter Back

Wireless Interface Configuration

Data Connection Configuration

Connection State: Disabled ▼

Default SIM: SIM A ▼

Network Connection Configuration

Network Type: Auto ▼

APN Profile Configuration Select an APN to Update/Add

<input type="radio"/> APN 1	Profile Name: <input type="text" value="otasn"/>	Authentication: None ▼	PDP Type: IPv4 ▼
	Username: <input type="text"/>	Password: <input type="text"/>	
<input checked="" type="radio"/> APN 3	Profile Name: <input type="text" value="spl1436.i.dlsn"/>	Authentication: None ▼	PDP Type: IPv4 ▼
	Username: <input type="text"/>	Password: <input type="text"/>	
<input type="radio"/> APN 9	Profile Name: <input type="text" value="cinet.spcs"/>	Authentication: None ▼	PDP Type: IPv4 & IPv6 ▼
	Username: <input type="text"/>	Password: <input type="text"/>	
<input type="radio"/> APN 16	Profile Name: <input type="text" value="spl1436.i.dlsn"/>	Authentication: None ▼	PDP Type: IPv4 ▼
	Username: <input type="text"/>	Password: <input type="text"/>	

Delete Update Home

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4. If a different APN is required, select the APN using the radial buttons. Then clear the fields and enter the correct settings.

5. Select enabled or disabled for the Connection State and click update button.
6. If this unit is going to be used as a template for subsequent configurations perform a backup using the “Entire System” described at the bottom of this document.
7. Restart the unit. It should connect to the network and the Link LED should be on
8. Done

Once these steps are completed, the selected APN and WAN connection status are saved in the appropriate firmware area. If a template configuration has been created, it can be cloned to additional machines using the “Entire System” restore option of the backup/restore feature.

Configure and Save Current Image on Sprint and Verizon Wireless

[For the purposes of this document, a legacy CDMA carrier is Sprint or Verizon Wireless]

Legacy CDMA carriers download APN information as a part of the activation process. Typically, these carriers download a table of APNs assigned to specific numbered slots between 1 and 16. From the factory the firmware image for both legacy CDMA carriers has default APNs assigned by slot number. However, there are no assurances that the slot number order will be preserved over time. In addition, the table of APNs downloaded is, in many cases specific to the type of account assigned to the SIM card. Examples would be Datalink and Mobile Private Network (MPN) accounts vs. a standard Internet account

The net effect of all of this is that is that the user has two choices. Either they can configure each SkyRouter at network activation time or, if pre-activation configuration is desired, at least one SkyRouter will need to be activate on that network with the specific account type desired. Once the template configuration has been created, it can be cloned to additional machines using the “Entire System” restore option of the backup/restore feature.

Procedure

1. Install a SIM card matching the current network firmware image and desired account type
2. Power up SkyRouter
3. Wait for the network activation to complete. Activation will be complete when the unit has received the phone number and IP address associated with the SIM card in use.
4. On the wireless configuration screen verify that the correct APN is selected
5. If a different APN is required, select the correct APN from the pull-down list
6. Select enabled or disabled for the WAN connection state and update
7. If this unit is going to be used as a template for subsequent configurations perform a backup using the “Entire System” selection found under the Tools menu.
8. Restart the unit. It should connect to the network and the Link LED should be on
9. Done

Activate a Unit (CDMA or GSM) Using a Template

1. Perform an “Entire System” restore using a template previously created with the Backup/Restore feature
2. **Note:** For step 1 use the Backup/Restore feature found under the Tools menu
3. Power down the unit
4. Insert an active SIM card for the network that was installed when the template was created
5. Power up unit
6. Verify a network connection (Link LED) on the desired APN.
7. Done

Ctek uses the basic processes described herein to provide users with a multi-network configuration process designed for production environments. For additional information on this multi-network automatic configuration process, see TechNote TN033.

Entire System Backup

1. Select Tools on the router home page
2. Make sure a USB flash drive is connected to the router then click the Backup/Restore button.
3. Select the Entire System radial button.

The screenshot displays the web interface for a Series 4550 SkyRouter. At the top left, the text "Series 4550 SkyRouter" is visible. On the top right, there are three buttons: "Home", "Back", and "Detach USB". A red horizontal bar across the middle contains the text "System Backup/Restore Utilities". Below this bar, the heading "Select a Module" is followed by a list of radio buttons: "Automation Control", "Entire System" (which is selected), "Product Branding", "Firmware Updates", and "Logs". At the bottom of the interface, there are three buttons: "Backup", "Restore/Install", and "Back". The footer text reads "Ctek Automation & Wireless Solutions © Ctek 2017".

- Click the Backup button.
- Type in the name you would like to call this Backup.

Series 4550 SkyRouter Home
Back
Detach USB

System Backup/Restore Utilities

Create Entire System Backup

Save As:

Save Back

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- If saved it will show you a message on a green bar telling you it was successful.

Series 4550 SkyRouter Home
Back
Detach USB

System Backup/Restore Utilities

Entire System successfully saved to radio.conf

Select a Module

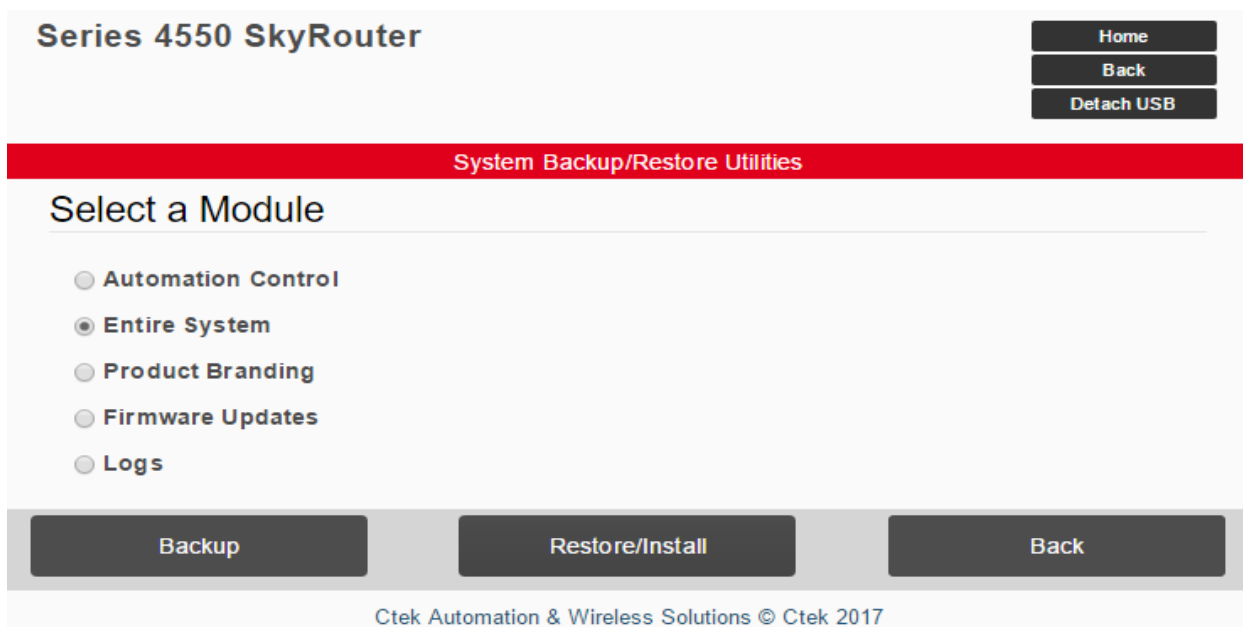
- Automation Control
- Entire System
- Product Branding
- Firmware Updates
- Logs

Backup Restore/Install Back

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Restore from System Backup

1. Select Tools on the router home page
2. Make sure a USB flash drive is connected to the router then click the Backup/Restore button.
3. Select the Entire System radial button.



4. Select the Restore/Install button.
5. On the next screen select the Backup to load in the drop down window. (**note:** will only list files saved in the correct directory. In this case it would be the /SkyRouter/Entire System/ directory of the flash drive.



6. If installed it will show you a message on a green bar telling you it was successful.

The screenshot displays the 'Series 4550 SkyRouter' interface. At the top right, there are three buttons: 'Home', 'Back', and 'Detach USB'. A red banner across the middle reads 'System Backup/Restore Utilities'. Below this, a green message box states 'Configuration radio.conf successfully installed'. Underneath, the section 'Select a Module' is followed by a list of radio button options: 'Automation Control', 'Entire System', 'Product Branding', 'Firmware Updates', and 'Logs'. At the bottom, there are three buttons: 'Backup', 'Restore/Install', and 'Back'. The footer text reads 'Ctek Automation & Wireless Solutions © Ctek 2017'.