

Table 0-12. Base Station Test Page

	Field/Control	Description
		<ul style="list-style-type: none"> Run as Master – Starts the test with the radio as the master. Run as Slave – Starts the test with the radio as the slave.
④	Control Buttons	<ul style="list-style-type: none"> Reboot – reboots the system.

Notes:

- Executing any of the tests from this page requires a reboot of the system to return the radio to normal operation.

Base Station Admin Page

The screenshot shows the 'Aeronix 802.16 Tactical Radio' Base Station Admin Page. The browser address bar shows 'http://10.80.4.45/80216d/Admin.htm'. The page title is 'Aeronix 802.16 Tactical Radio'. On the left is a sidebar with buttons: Home, S/W Config, Radio Control, Service Flows, Registered SSs, ACM Params, Status, Bit Status, Maintenance, Network Status, Power Settings, Test, Admin (highlighted), S/W Update, Version, Save Settings, Contact, Logout.

Key Management

Slot	Key Tag	Owner
0	356274DC0000356274DC356274F8356274E00003356275000006	User
1	356274DC0001356274DC356274F8356274E00004356275000009	User
2	356274DC0004356274DC356274F8356274E0000735627500000C	User
3	356274DC0009356274DC356274F8356274E0000C35627500000F	User
4	356274DC0010356274DC356274F8356274E00013356275000012	User

Current Eff. Key: 2 Effective Key: Key 2

Account Management

Account Name	User Type
bin	Crypto Officer
daemon	User

Table 0-13. Base Station Admin Page		
	Field/Control	Description
①	Key Management	Provides the crypto user with the capability to choose the active key slot by selecting the slot from the drop down menu and clicking the set button.
②	Account Management	Provides each user with the capability to change their account passwords.

Base Station Software Update Page

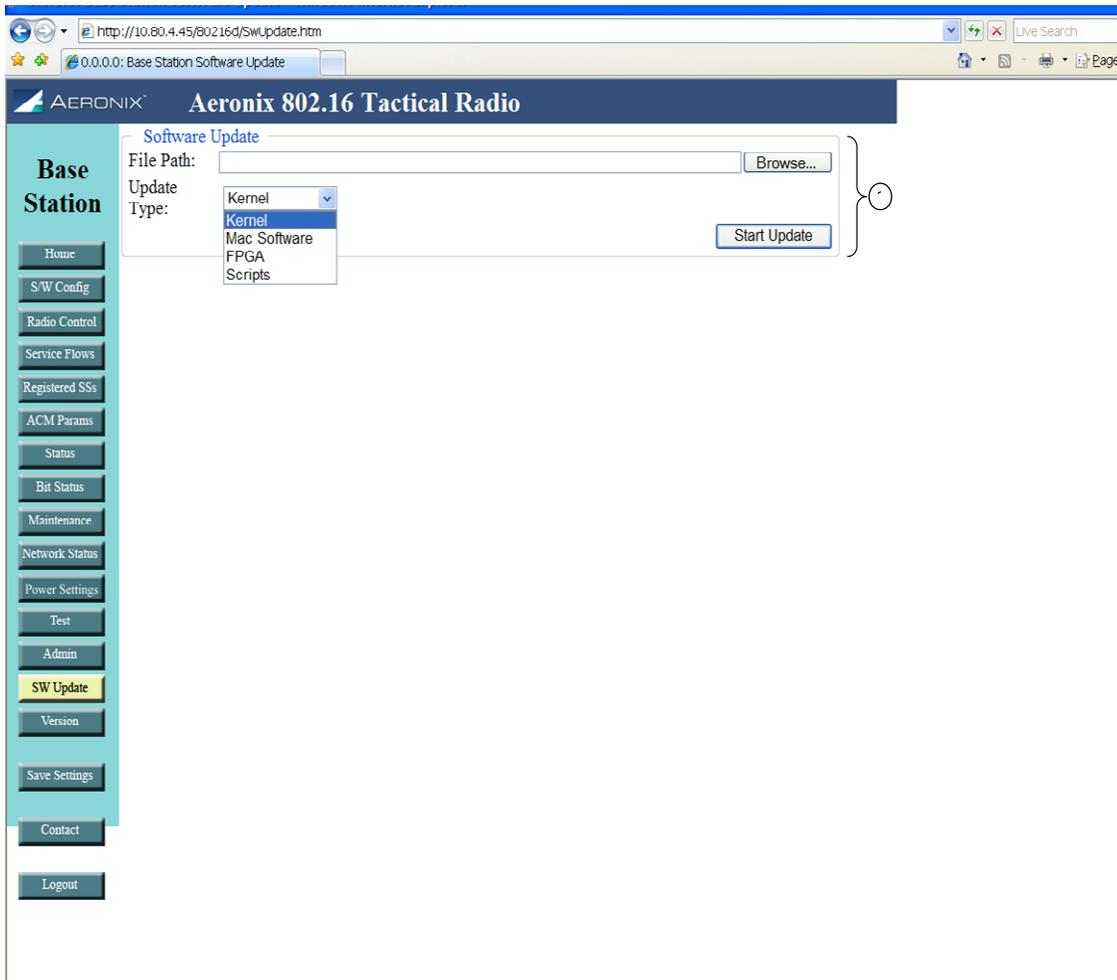


Table 0-14. Base Station Software Update Page		
	Field/Control	Description
①	Software Update	Provides the crypto user with the capability to update the software on the unit. <ul style="list-style-type: none"> • File Path – location of the new file to

Table 0-14. Base Station Software Update Page		
	Field/Control	Description
		update on the unit. <ul style="list-style-type: none"> Update type – the type of file on the unit to update. Start update button – initiates the update process

Base Station Version Page

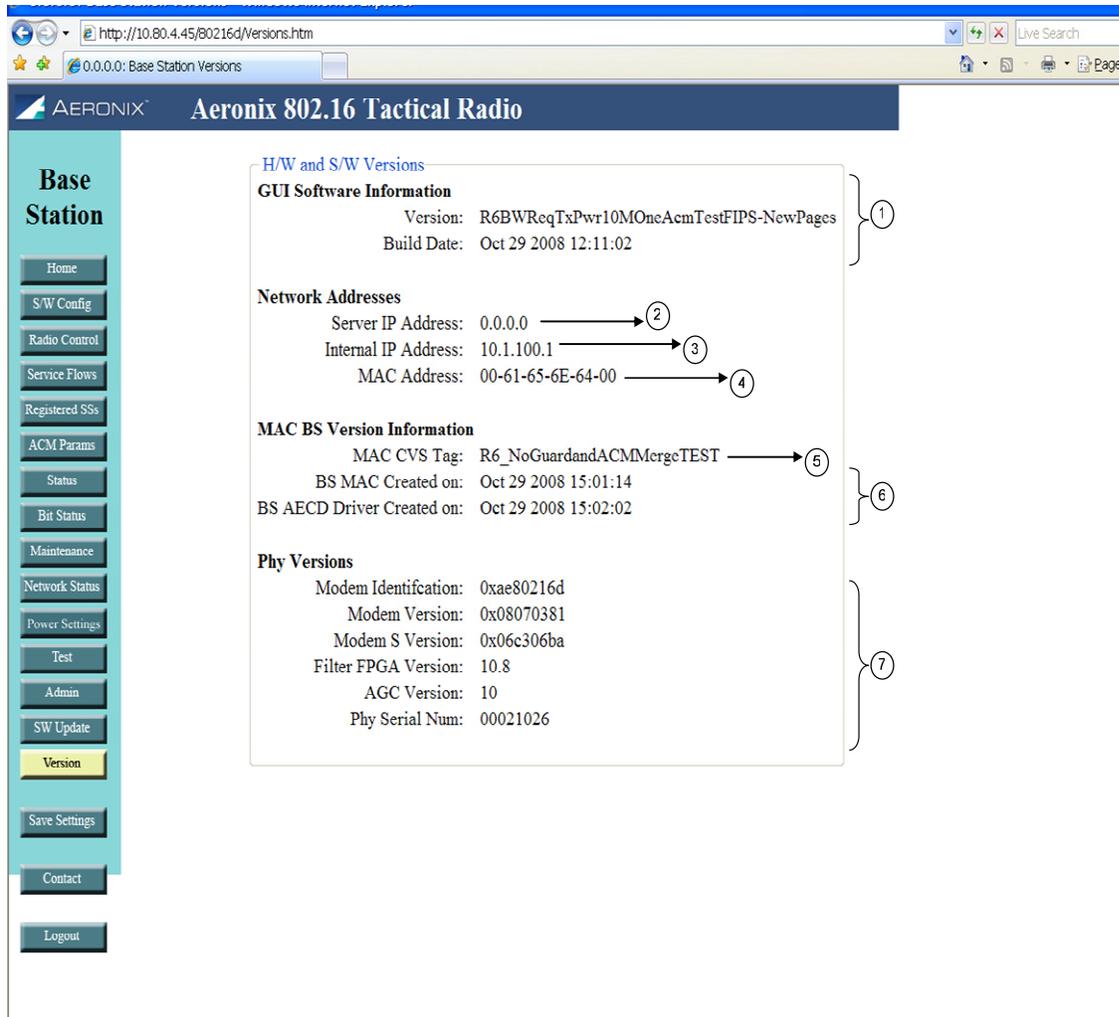


Table 0-15. Base Station Version Page		
	Field/Control	Description
①	GUI Software Information	Date and Time of current GUI build
②	Server IP Address	Ethernet IP Address of Base Station
③	Internal IP Address	MAC S/W network interface IP Address

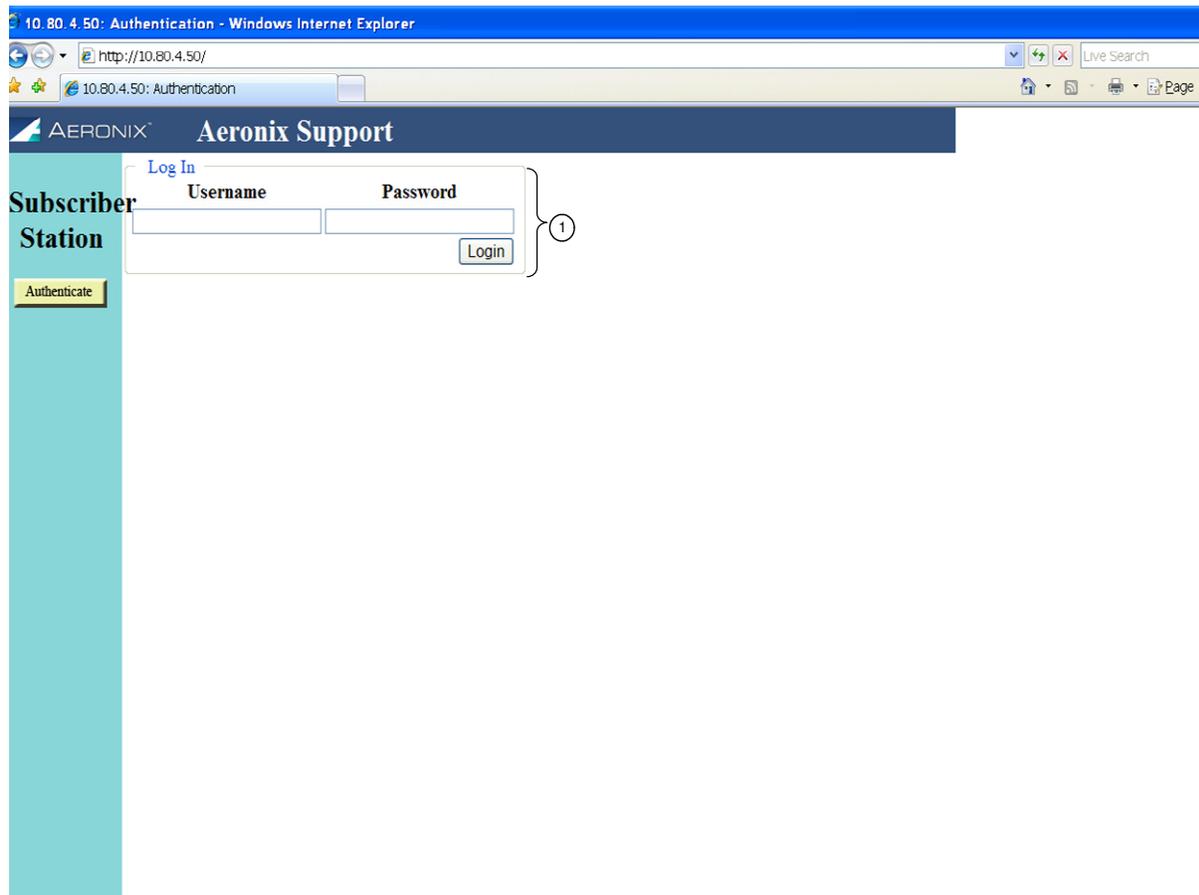
Table 0-15. Base Station Version Page		
	Field/Control	Description
④	MAC Address	MAC H/W Address of Base Station network interface
⑤	MAC CVS Tag	BS MAC S/W current version
⑥	BS MAC Dates	BS MAC modules build date and time
⑦	Phy Versions	Firmware versions for PHY and Serial Number of PHY hardware

Base Station Contact Page

The contact page provides contact information for the 802.16 product.

Subscriber Station Login Page

The subscriber station requires a login for access to configuration screens. The subscriber station contains one crypto officer login and one user login. Access to certain configuration items is restricted for the user login.



	Link	Description
①	Login	Location to provide the username and password

Subscriber Station Home Page

The subscriber station home page contains HTML links to the status and configuration pages for the 802.16 radio product family.

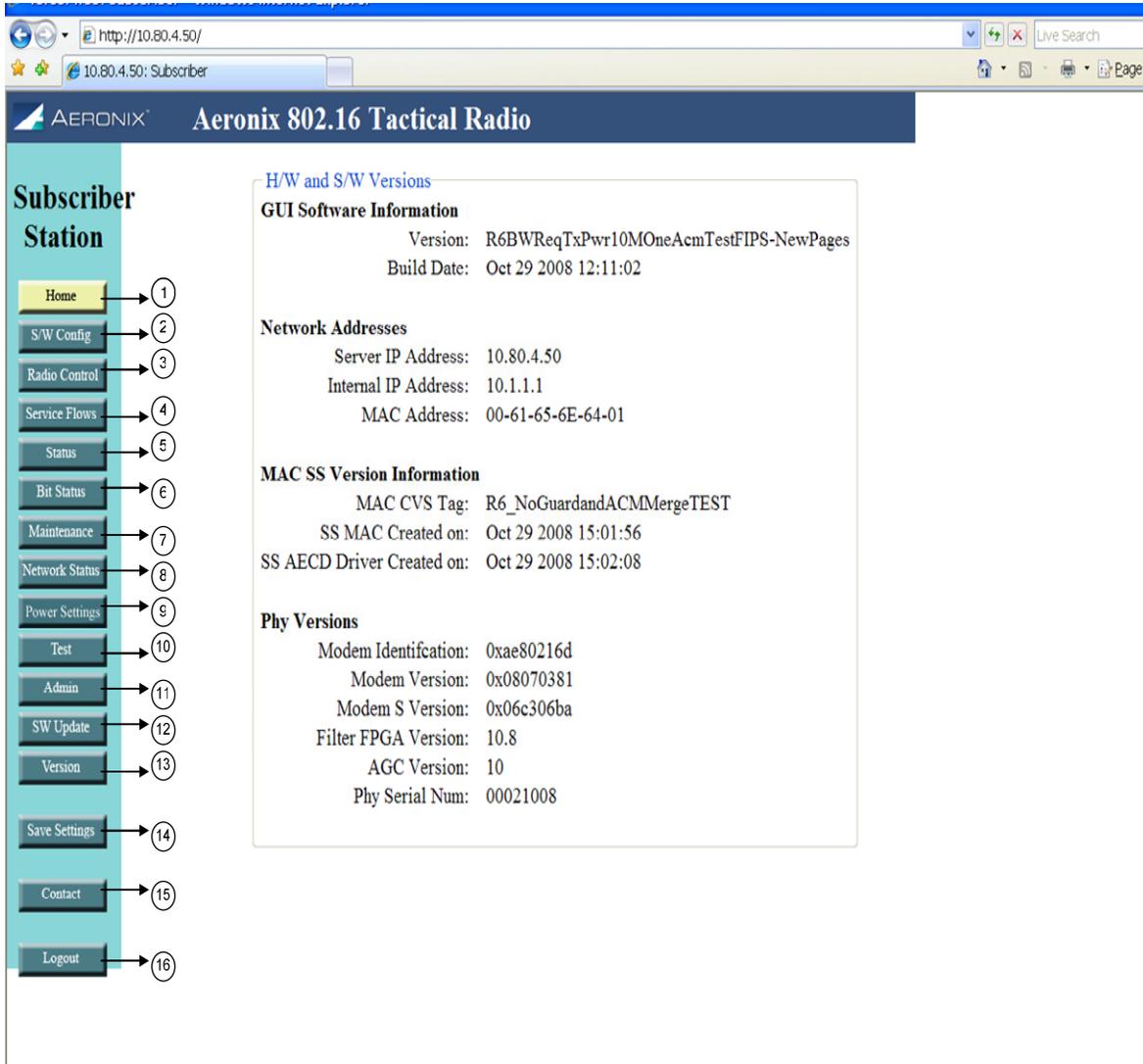


Table 0-17. Subscriber Station Home Page

	Field/Control	Description
①	Home	HTML Link to the Home page that displays network access information as well as the hardware and software version information.
②	SW Config	HTML Link to the software configuration page; the configuration page contains the needed tools to define and configure the external systems interaction with the 802.16 radio.
③	Radio Control	HTML Link to the Radio Control Page; the radio control page contains channel, initial ranging and TRANSEC parameters. The user has limited capabilities for TRANSEC and keying.

Table 0-17. Subscriber Station Home Page		
	Field/Control	Description
④	Service Flow	HTML Link to the Service Flow page; the service flow page displays the current service flows within the node and the current state of each service flow; this page is used to enable or disable the ARQ.
⑤	Status	HTML Link to the Status page; the status page contains operating status of the radio.
⑥	Bit Status	HTML Link to the Bit Status results page. This page provides results of the test executed at startup.
⑦	Maintenance	HTML Link to the Maintenance; the maintenance page contains information for debugging and antenna pointing.
⑧	Network Status	HTML Link to the Network Status page; this page provides transmit and receive status for the Ethernet interface.
⑨	Power Settings	HTML link to the Power Settings page; this page provides the capability to enter gain settings and cable loss settings for ranging purposes.
⑩	Test	HTML link to the Test page for running either a CW test or BER test.
⑪	Admin	HTML Link to the administration page. This page provides TRANSEC key selection and password changing capabilities. The user login does not have access to the TRANSEC key selection functions.
⑫	Software Update	HTML Link to the software update page. This page provides the capability to update the software to the crypto officer only.
⑬	Version	HTML Link to Version page; the version page contains the hardware and software version information.
⑭	Save Settings	Save Settings control key will save the current selected values in each GUI screen to the Base Station database. Additions, modifications or deletions are not permanently saved to the database unless this control key is selected.
⑮	Contact	HTML Link to the Contact Page; the contact page contains Aeronix Inc. contact information.
⑯	Logout	The logout control key logs the current user out of the system.

Subscriber Station Software Configuration Page

This page is for display only and shows the classifier rules received from the base station.

The screenshot shows a web browser window titled "10.80.4.50: Subscriber Configuration - Windows Internet Explorer". The address bar shows "http://10.80.4.50/80216d/Configuration.htm". The page header is "AERONIX Aeronix 802.16 Tactical Radio". On the left is a "Subscriber Station" menu with buttons for Home, S/W Config, Radio Control, Service Flows, Status, Bit Status, Maintenance, Network Status, Power Settings, Test, Admin, SW Update, Version, Save Settings, Contact, and Logout. The main content area is titled "Class Rules" and contains a table with the following data:

Index	SF	Src MAC	Src Mask	Dest MAC	Dest MASK
1	5	00-61-65-6E-64-01	FF-FF-FF-FF-FF-FF	00-61-65-6E-64-00	FF-FF-FF-FF-FF-FF
2	5	00-61-65-6E-64-01	FF-FF-FF-FF-FF-FF	00-61-65-6E-64-02	FF-FF-FF-FF-FF-FF

A circled number "1" is placed to the right of the table, with a bracket pointing to the entire table.

Subscriber Station Radio Control Page

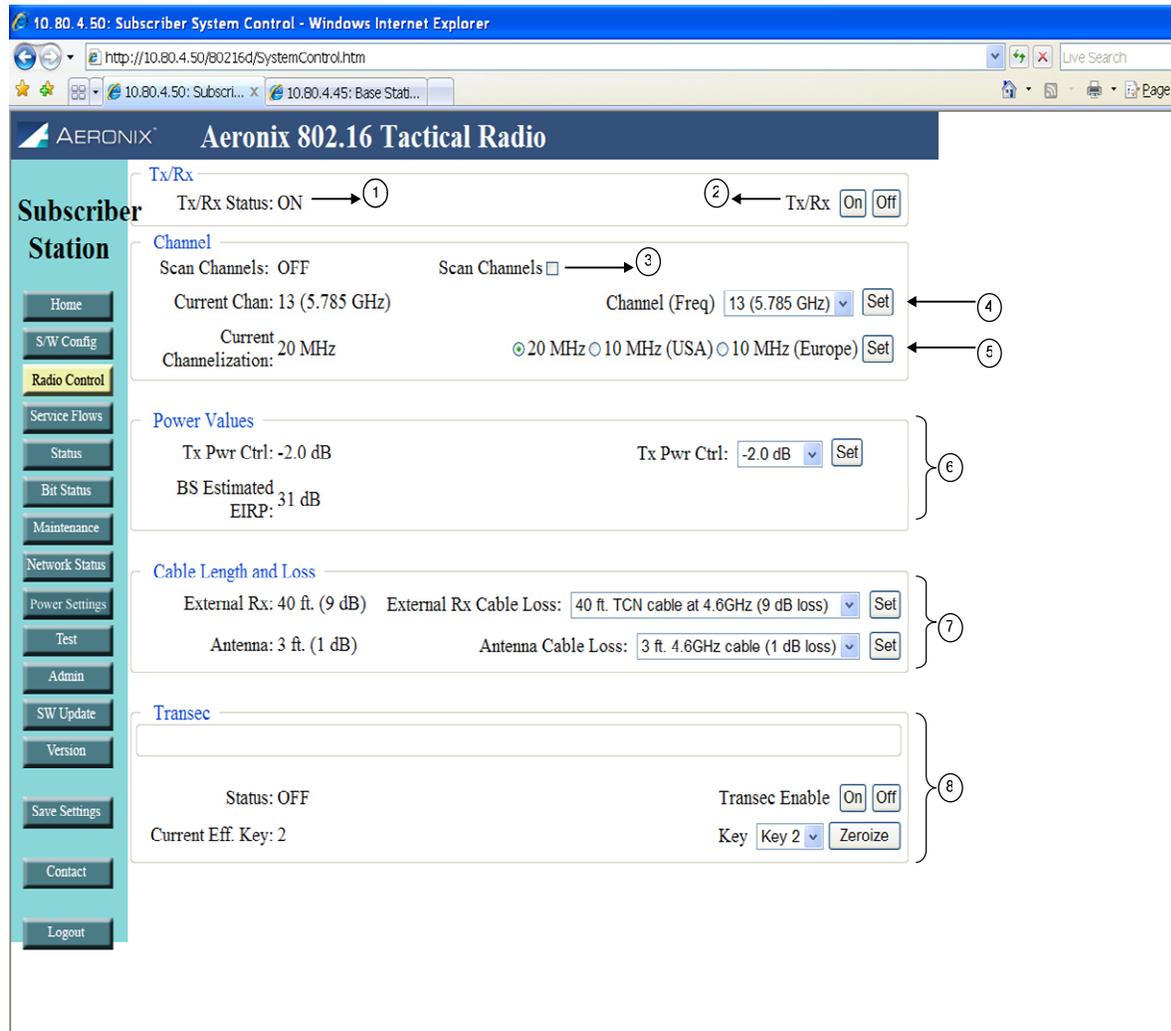


Table 0-18. Subscriber Station Radio Control Page		
	Field/Control	Description
①	Tx/Rx Status	The Tx/Rx Status indicates if the user has selected the Tx/Rx control on or off.
②	Tx/Rx On and Off Buttons	Buttons to select the Tx/Rx function to be turned on or off. When turned off the subscriber will not transmit or receive.
③	Scan Channels	Scan Channels allows the subscriber to scan all channels in a frequency band searching for a valid base station signal. Select the box to turn scan channels on. The scan channels display of the left of the screen shows the current scan channels setting. If scan channels is off the subscriber only uses the current channel.
④	Channel	Displays channel information for the subscriber station. <ul style="list-style-type: none"> Current Channel – displays the current channel of the subscriber station.

Table 0-18. Subscriber Station Radio Control Page		
	Field/Control	Description
		<ul style="list-style-type: none"> • Channel (Freq) – drop down to choose a different channel for the subscriber station. • Set Button – changes the current channel of the subscriber station to the channel selected by the channel (freq) drop down.
⑤	Channelization	<p>Allows the user to choose the channelization of the radio.</p> <ul style="list-style-type: none"> • Cur Channelization – Displays the current channelization setting of the radio. • Channelization Selection – Allows the selection of channelization. The 10MHz Europe is not enabled in this release. • Set Button – changes the current channelization selected by the user.
⑥	Power Values	<p>Allows the user to adjust the transmit power of the radio.</p> <ul style="list-style-type: none"> • Tx Pwr Ctrl – the value on the left of the screen shows the current setting. The drop down on the right side of the screen allows the user to choose a different setting. Any grey value in the drop down is not currently supported in the product. • Set Button – changes the transmit power control parameter to the chosen value from the drop down. • BS Estimated EIRP – the value is an estimated EIRP based upon configuration settings and received RSSI readings.
⑦	Cable Length	<p>Allows the user to define certain cable length values. The choices are defined on the Power Settings configuration page by a privileged user.</p> <ul style="list-style-type: none"> • External Rx – the current cable length and loss defined in the system for the external receive cable. • External Rx Cable Loss – drop down to choose the receive cable length and loss in dB for the external receive cable. • Set Button – changes the external receive cable loss parameter in the radio. • Antenna – the current cable length and loss defined in the system for the antenna cable. • Antenna Cable Loss – drop down to choose the antenna cable loss parameter. • Set Button – changes the antenna cable loss parameter in the radio.
⑧	Transec	<p>Displays the settings for Transec capability.</p> <ul style="list-style-type: none"> • Status - Displays whether Transec is on or off on the base station.

Table 0-18. Subscriber Station Radio Control Page		
	Field/Control	Description
		<ul style="list-style-type: none">• Transec On/Off – buttons to turn Transec on or off. The crypto user is the only user that can turn Transec off.• Current Effective Key – displays the key slot of the current effective key. The current key is selected on the Admin page by the crypto officer.• Key – drop down to select a key slot to zeroize.• Zeroize – button to initiate the zeroization of the key slot selected in the key drop down.

Subscriber Station Service Flow Page

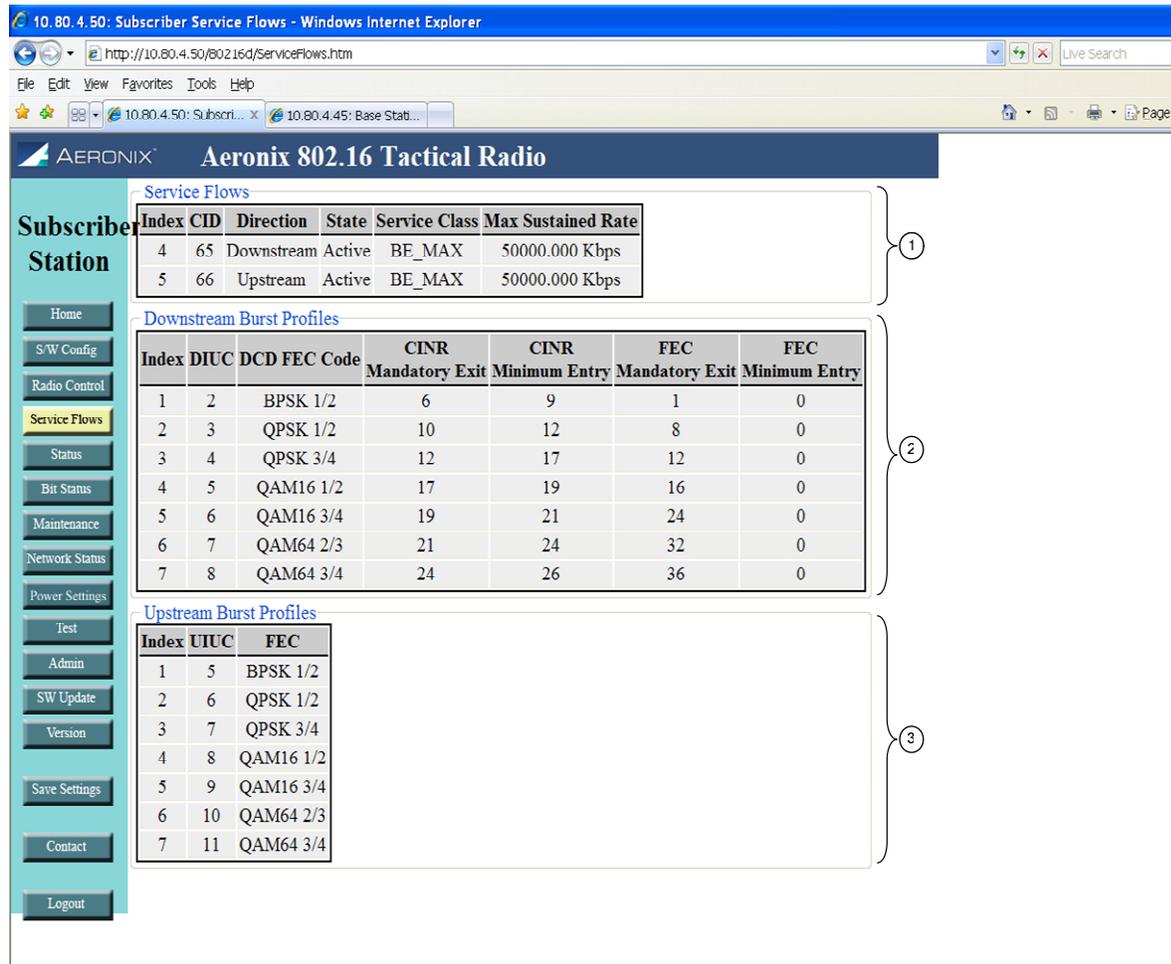


Table 0-19. Subscriber Station Service Flow Page

	Field	Description
①	Service Flows	<p>Displays every service flow that is currently configured in the base station for the subscriber station. Displays the following fields:</p> <ul style="list-style-type: none"> • Index - Actual index number assigned to the service flow. • CID - Basic CID for this service flow. • Direction - Direction is either upstream or downstream. • State - States can be Provisioned, Admitted, or Active. Provisioned is a service flow that was configured but the subscriber has not yet established communication with the base station. Admitted is a state in which a subscriber is registered and allowed in the system but is not yet flowing traffic. Active is a flow that currently has traffic or the ability to pass traffic. • Service Class - The textual name of a configured

Table 0-19. Subscriber Station Service Flow Page		
	Field	Description
		<p>service class that the node is using for QOS parameters.</p> <ul style="list-style-type: none"> • Max Sustained Rate - QOS parameter that defines the maximum sustained rate that will be made available to the flow.
②	Downstream Burst Profiles	<p>Displays the downstream burst profiles which define the FEC types that the base station uses for transmissions. These fields are configured on the base station.</p> <p>Entry Fields (display only):</p> <ul style="list-style-type: none"> • Index - the index into the burst profile table for the entry. This field is not entered by the user. • DIUC – the DIUC for the entry. This field is not entered by the user. • DCD FEC Code – drop down menu to choose the FEC to use for the burst profile. This defines the modulation type and forward error correction. • CINR Mandatory Exit – Threshold value of CINR in dB that is used as a decision point to exit the use of this profile. Valid values are 1-65. • CINR Minimum Entry - Threshold value of CINR in dB that is used as a decision point to enter the use of this profile. Valid values are 1-65. • FEC Mandatory Exit – Threshold value of FEC errors that is used as a decision point for exiting a current modulation. The unit of this value is bits per symbol. • FEC Mandatory Entry – Threshold value of FEC errors that is used as a decision point for entering a modulation. The unit of this value is bits per symbol.
③	Upstream Burst Profiles	<p>Displays the upstream burst profiles which define the FEC types that the subscriber stations use for transmissions. The current implementation uses the same values for upstream as downstream for CINR and FEC entry and exit.</p> <p>Entry Fields (display only):</p> <ul style="list-style-type: none"> • Index - the index into the burst profile table for the entry. • UIUC – the UIUC for the entry. <p>FEC – type of modulation and forward error correction of the burst profile.</p>

Subscriber Station Status Page

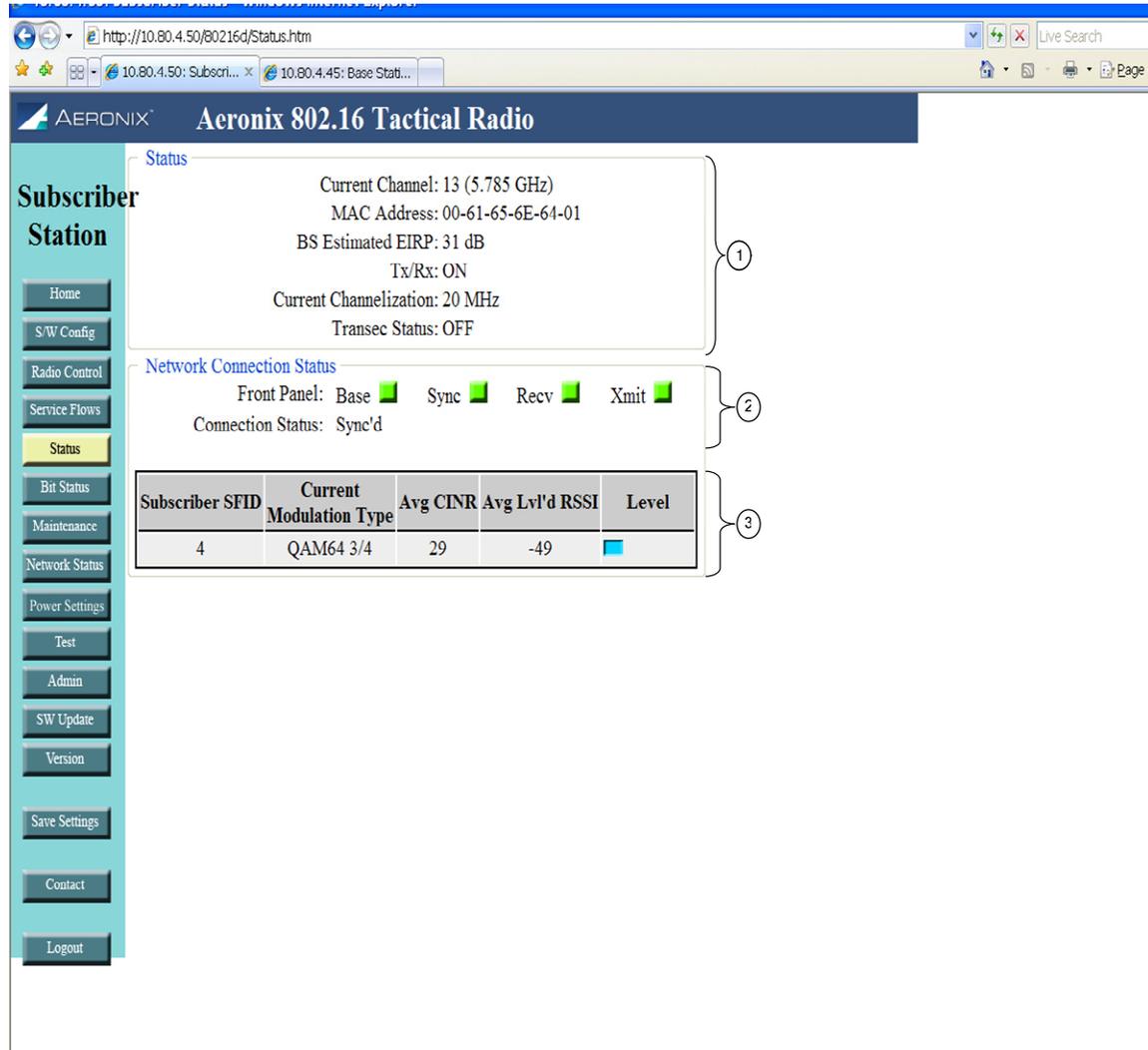


Table 0-20. Subscriber Station Status Page		
	Field/Control	Description
①	Status	<p>Status displays a subset of current settings.</p> <ul style="list-style-type: none"> • Current Channel – the current 802.16 specified channel that the subscriber station uses for transmit and receive in scan channels is disabled. • MAC Address – The IEEE 802.16 MAC address of the subscriber station. • BS Estimated EIRP – Displays the estimated EIRP of the subscriber station based upon user configured gain a loss values. • Tx/Rx - Status indicating whether the base station Tx/Rx capability is currently on or off. • Current Channelization– displays the

Table 0-20. Subscriber Station Status Page		
	Field/Control	Description
		channelization of the subscriber station. <ul style="list-style-type: none"> • Transec Status – displays the current status of Transec (on.off)
②	Network Connection Status	<ul style="list-style-type: none"> • Front Panel - Displays the PHY status lights on an interval basis. • Connection Status – The status of the connection from the perspective of the MAC.
③	Status Table	Displays the status of each subscriber connection. <ul style="list-style-type: none"> • Subscriber SFID - Contains the service flow ID of the downstream service flow to the subscriber. • Current Modulation Type – Contains the current modulation/FEC type for the receive connection. The display show the modulation of the receive frame at the time sampled. • Avg CINR – Displays the average CINR value for the receive connection. • Avg Leveled RSSI – Displays the average leveled RSSI value for the receive connection. The value is calculated from the receive loss and gain values entered by the user and the actual RSSI value received by the PHY. • Level – Displays the level of the RSSI.

Subscriber Station Bit Status Page

This page shows the results of the bit tests executed at startup. The names and number of tests may change due to FIPS requirement changes.

The screenshot shows a web browser window with the URL `http://10.80.4.50/80216d/BitStatus.htm`. The browser tabs show `10.80.4.50: Subscri...` and `10.80.4.45: Base Stati...`. The page header features the Aeronix logo and the title **Aeronix 802.16 Tactical Radio**. On the left, a vertical sidebar titled **Subscriber Station** contains a list of navigation buttons: Home, S/W Config, Radio Control, Service Flows, Status, **Bit Status** (highlighted), Maintenance, Network Status, Power Settings, Test, Admin, SW Update, Version, Save Settings, Contact, and Logout. The main content area displays the **Bit Status** information:

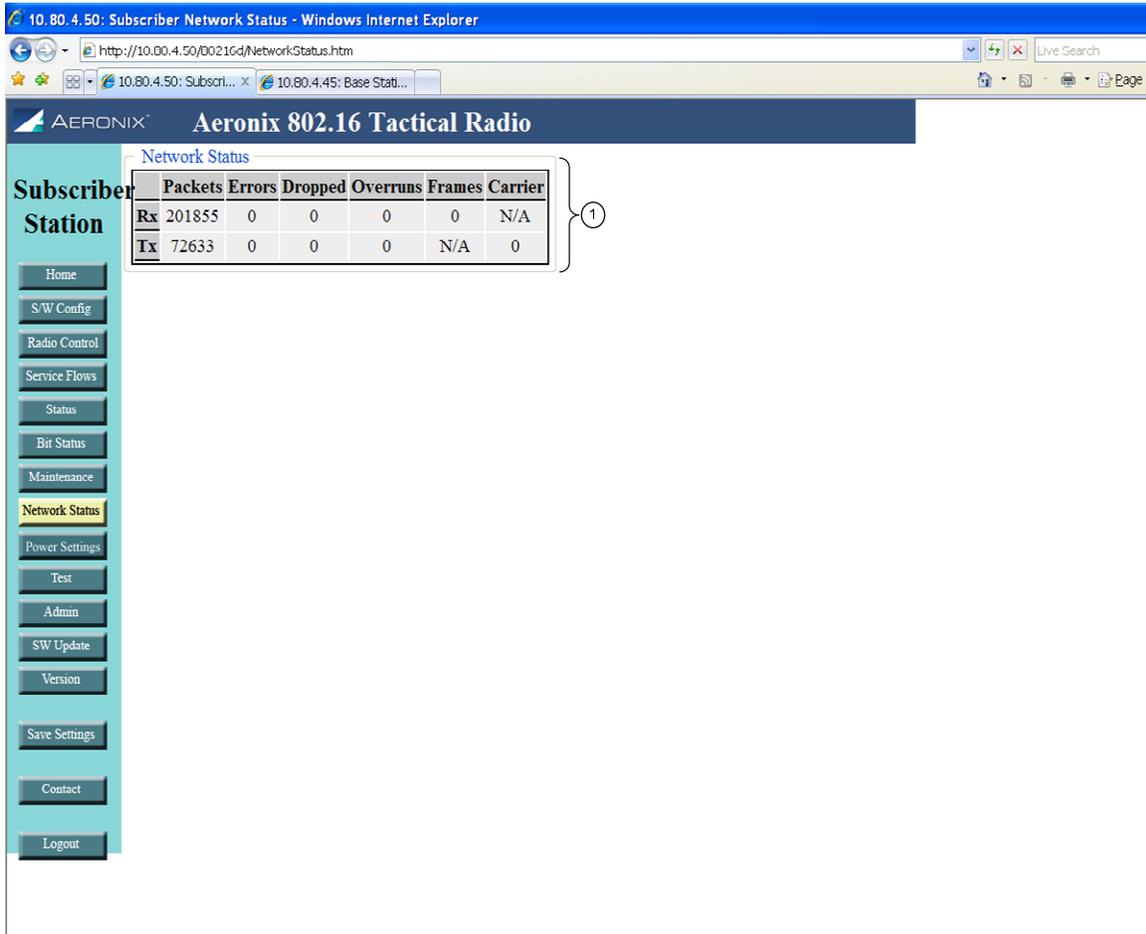
Bit Status
Kernel Bit Status
RAM Test: OK
Flash Test: OK
Kernel Status: OK
Network Status: OK
Phy Link: UP

Subscriber Station Maintenance Page

Table 0-21. Subscriber Station Maintenance Page		
	Field/Control	Description
①	Node Maintenance	Provides a method of rebooting the system without a power cycle. Provides a method to revert back to the default database.
②	Channel Maintenance Status	Provides some additional values on a connection basis for debugging and antenna pointing purposes. <ul style="list-style-type: none"> • Current CINR – the instantaneous CINR for the connection. • Average CINR – the average CINR of the connection over a period of received frames. • Current RSSI – the instantaneous RSSI for the connection. • Average RSSI – the average RSSI of the connection over a period of received

Table 0-21. Subscriber Station Maintenance Page		
	Field/Control	Description
		<p>frames.</p> <ul style="list-style-type: none"> • Current Leveled RSSI – the current leveled RSSI value for the connection. The leveled RSSI reflects the loss and gain values from the output of the PHY (including the transmit power attenuation value) to the PA/LNA. • Average Leveled RSSI – the average leveled RSSI value of the connection over a period of received frames. • Average Frequency Offset – the average frequency offset of the connection over a period of received frames. • FEC Corrected Bits – the instantaneous forward error correction corrected bits • Average FEC Corrected Bits – the average forward error correction corrected bits for the connection
③	Tx/Rx Maintenance Status	<p>Provides the Tx and Rx frame counts and well as error counts for debugging.</p> <ul style="list-style-type: none"> • Rx Frames – the number of frames received • Invalid Frames – the number of frames received that were invalid • CRCs Rx – the number of CRCs received • Reset Rx – the number of times the receive path has been reset • Tx Frames – the number of frame transmitted • Tx Drop – the number of transmit frames that were dropped by the classifiers
④	Ranging Environment	<p>Provides the gain and loss settings used for ranging purposes and EIRP calculations. These settings are configured on the Power Settings and Radio Control pages.</p>
⑤	PHY Temperature	<p>Provides the temperature of the PHY card inside of the radio box.</p>

Subscriber Station Network Status Page



	Field/Control	Description
①	Network Status	Displays the number of transmitted and received frames on the network side of the radio. This reflects the eth0 interface in a non-bridging configuration and the mybridge interface in a bridging configuration.

Subscriber Station Power Settings Page

Subscriber Station

Home
S/W Config
Radio Control
Service Flows
Status
Bit Status
Maintenance
Network Status
Power Settings
Test
Admin
SW Update
Version
Save Settings
Contact
Logout

Static Gain and Loss

Gain:		Loss:	
PA Tx Gain:	38 dB	Internal Rx Cable Loss:	1 dB
LNA Rx Gain:	32 dB	Internal Tx Cable Loss:	1 dB
Antenna Gain:	6 dB		

External Rx Cable Menu

External Rx Cable Loss:	Comments:
40 ft. 9 dB	TCN cable at 4.6GHz
40 ft. 10 dB	TCN cable at 5.8GHz
47 ft. 9 dB	VWP cable at 4.6GHz

External Tx Cable Menu

External Tx Cable Loss:	Comments:
40 ft. 9 dB	TCN cable at 4.6GHz
40 ft. 10 dB	TCN cable at 5.8GHz
47 ft. 9 dB	VWP cable at 4.6GHz

Antenna Cable Menu

Antenna Cable Loss:	Comments:
3 ft. 1 dB	4.6GHz cable
6 ft. 1 dB	5.8GHz cable
0 ft. 0 dB	

Table 0-23. Subscriber Station Power Settings Page		
	Field/Control	Description
①	Static Gain and Loss	<ul style="list-style-type: none"> • PA Tx Gain – the transmit gain of the power amplifier located outside of the radio • LNA Rx Gain – the receive gain of the low noise amplifier located outside of the radio • Antenna Gain – the gain of the antenna located outside of the radio • Internal Rx Cable Loss - the loss of the cable and any other components in the receive path inside of the radio box but external to the PHY • Internal Tx Cable Loss – the loss of the cable and any other components in the transmit path inside of the radio box but external to the PHY • Attenuation – the change in transmit power of the PHY
②	External Rx Cable Menu	<ul style="list-style-type: none"> • Contains up to three entries for external receive cable loss values. This value represents the receive cable between the radio unit and the receive LNA. The user inputs the length of the cable in feet and the loss value in dB. The comment field is optional. The first value entered will be the default value that gets used initially for ranging, leveled RSSI and EIRP calculations. To change the values used go to the Radio Control page.
③	External Tx Cable Menu	<ul style="list-style-type: none"> • Contains up to three entries for the transmit cable loss values. This value represents the cable between the radio unit and the transmit power amplifier. The user inputs the length of the cable in feet and the loss value in dB. The comment field is optional.
④	Antenna Cable Menu	<ul style="list-style-type: none"> • Contains up to three entries for the antenna cable loss values. This value represents the cable between the power head and the antenna. The user inputs the length of the cable in feet and the loss value in dB. The comment field is optional.

Notes:

- The Set button in each section is used to place the current values entered into the database.

Subscriber Station Test Page

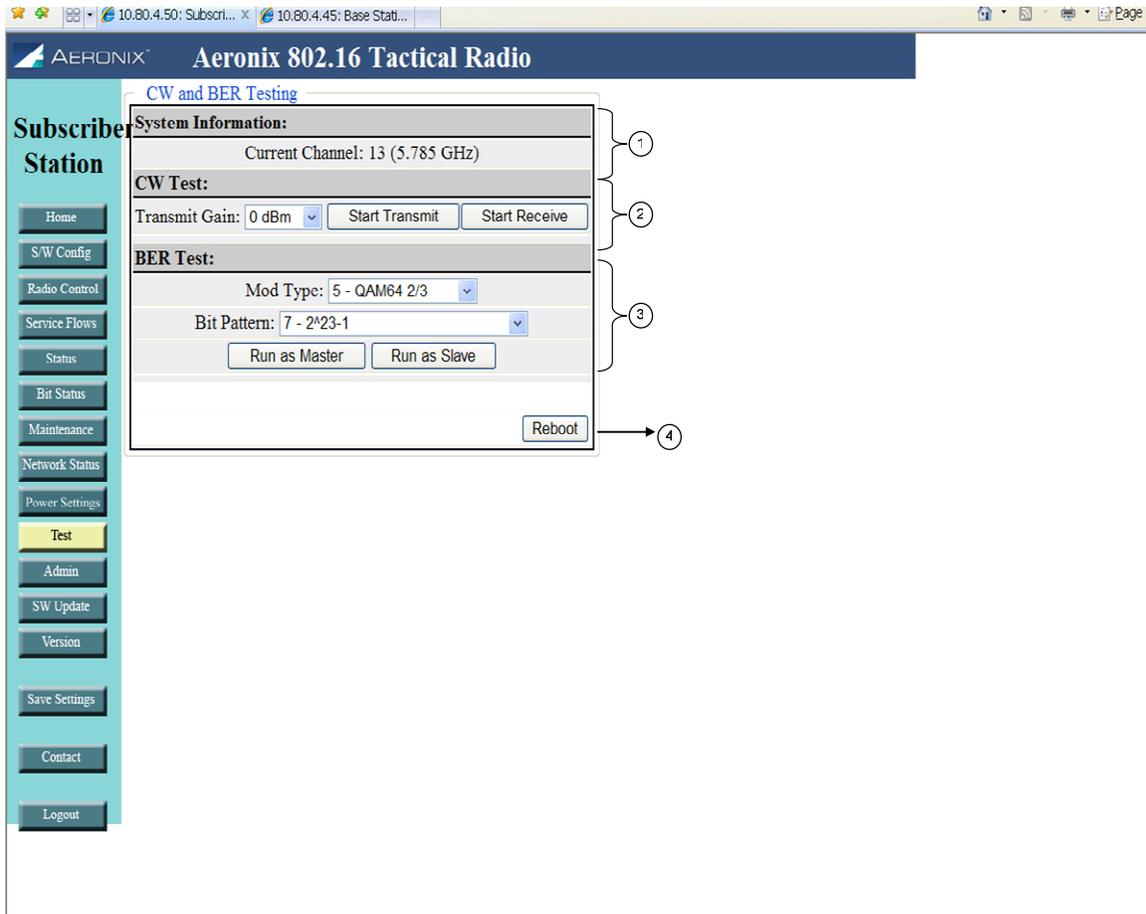


Table 0-24. Subscriber Station Test Page

	Field/Control	Description
①	System Information	Provides the current channel information of the radio
②	CW Test	Provides the capability to execute a continuous waveform test. <ul style="list-style-type: none"> • Transmit Gain – Selection of the transmit gain desired from the pull down menu. • Start Transmit – Starts the transmission of a CW • Start Receive – Starts the receive of a CW
③	BER Test	Provides the capability to execute a bit error rate test. <ul style="list-style-type: none"> • Mod Type – Defines the modulation type used during the test. • Bit Pattern – Define the bit patter used during the test. • Run as Master – Starts the test with the radio as the master.

Table 0-24. Subscriber Station Test Page

	Field/Control	Description
		<ul style="list-style-type: none"> Run as Slave – Starts the test with the radio as the slave.
④	Control Buttons	<ul style="list-style-type: none"> Reboot – reboots the system.

Notes:

- Executing any of the tests from this page requires a reboot of the system to return the radio to normal operation.

Subscriber Admin Page

Subscriber Station

- Home
- S/W Config
- Radio Control
- Service Flows
- Status
- Bit Status
- Maintenance
- Network Status
- Power Settings
- Test
- Admin
- SW Update Administration
- Version
- Save Settings
- Contact
- Logout

Key Management

Slot	Key Tag	Owner
0	346274DC0000346274DC346274F8346274E00003346275000006	User
1	346274DC0001346274DC346274F8346274E00004346275000009	User
2	346274DC0004346274DC346274F8346274E0000734627500000C	User
3	346274DC0009346274DC346274F8346274E0000C34627500000F	User
4	346274DC0010346274DC346274F8346274E00013346275000012	User

Current Eff. Key: 2 Effective Key: Key 2

Account Management

Account Name	User Type
bin	Crypto Officer
daemon	User

Table 0-25. Subscriber Station Admin Page		
	Field/Control	Description
①	Key Management	Provides the crypto user with the capability to choose the active key slot by selecting the slot from the drop down menu and clicking the set button.
②	Account Management	Provides each user with the capability to change account passwords.

Subscriber Software Update Page

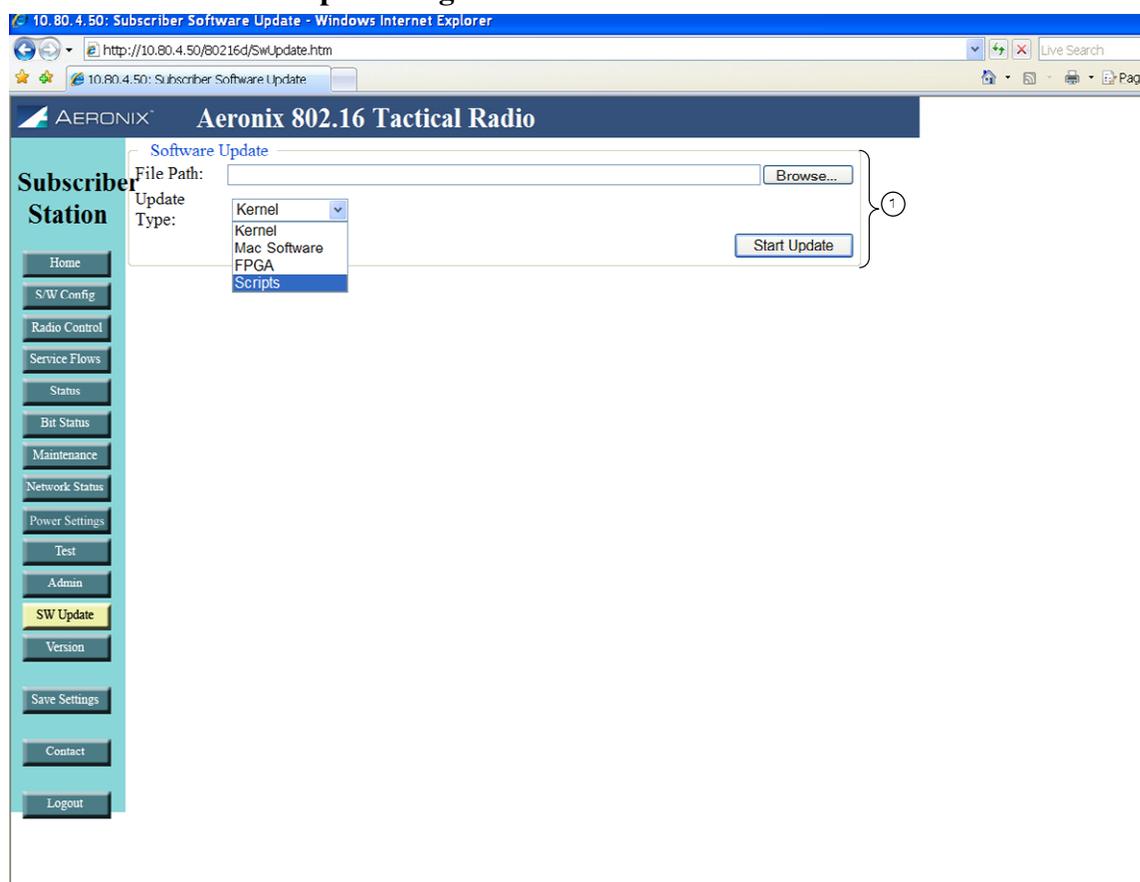


Table 0-26. Subscriber Station Software Update Page		
	Field/Control	Description
①	Software Update	Provides the crypto user with the capability to choose to update the software on the unit. <ul style="list-style-type: none"> • File Path – location of the file to update on the unit. • Update type – the type of file on the unit to update.

Table 0-26. Subscriber Station Software Update Page		
	Field/Control	Description
		<ul style="list-style-type: none"> Start update button – initiates the update process

Subscriber Station Version Page

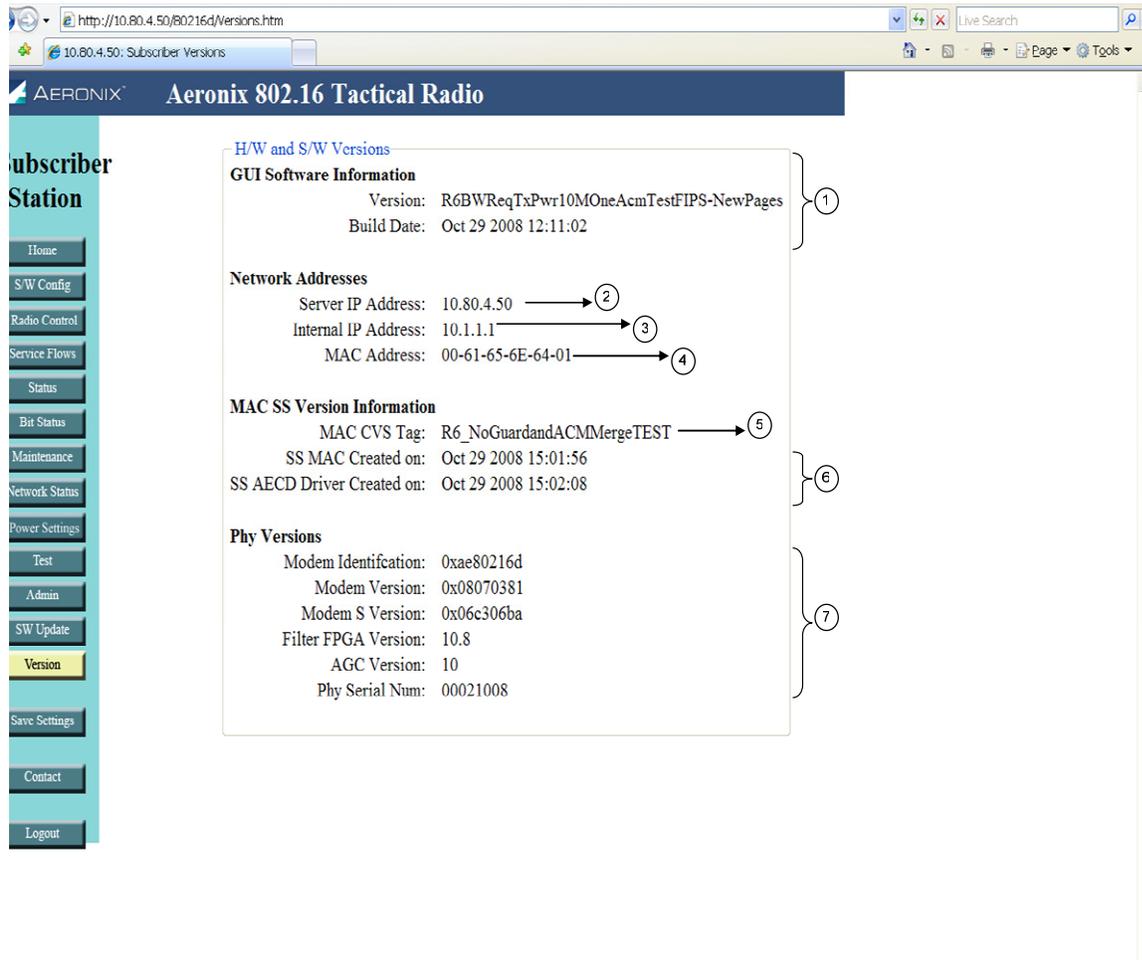


Table 0-27. Subscriber Station Version Page		
	Field/Control	Description
①	GUI Software Information	Date and Time of current GUI build
②	Server IP Address	Ethernet IP Address of Base Station
③	Internal IP Address	MAC S/W network interface IP Address
④	MAC Address	MAC H/W Address of SS network interface
⑤	MAC CVS Tag	SS MAC S/W current version
⑥	BS MAC Dates	SS MAC modules build date and time

Table 0-27. Subscriber Station Version Page		
	Field/Control	Description
⑦	Phy Versions	Firmware versions for PHY and Serial Number of PHY

Contact Page

The contact page provides contact information for the 802.16 product.

5.0 SYSTEM SETUP AND CONFIGURATION EXAMPLE

5.1 Bridging Mode Scenario

Setup a simple BS – SS Bridging configuration with one external network node on the SS and on external node on the BS. For a user scenario you should substitute users' addresses for BS, SS, PC1, and PC2.

In the bridging mode, use of internal MAC addresses is required. For the current radios the BS MAC is 00:61:65:6e:64:00 and SS MAC is 00:61:65:6e:64:nn where nn equals the subscriber number configured in the start script.

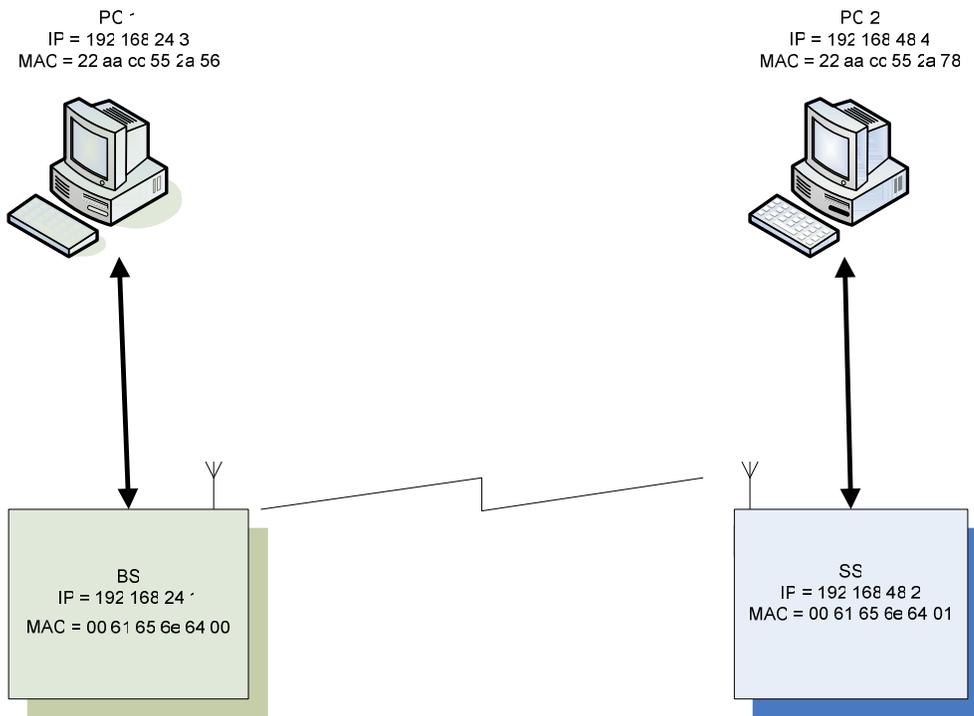


Figure 13. Example Bridging Setup Scenario

5.2 Bridging Base Station Configuration Mode

- 1) Turn AER16 Power ON.
- 2) Connect to AER16 Users Port with terminal emulator. (Baud = 115200, 8-N-1 no flow control)
- 3) `$ cd /mnt/jffs2`
- 4) `$ cp startShimBridgeBS start`
- 5) `$ vi start`
 - a. Change ifconfig line to use desired IP address“192.168.24.1”
 - b. Save file.

- 6) If you have upgraded to a release of code that has database changes, now is the time to remove your old databases. Please refer to the release notes of each release to determine if a remove of the database is necessary.
`rm /mnt/jffs2/database/*`
- 7) Open shell to radio and execute “reboot” to reboot the radio. < *reboot the machine or cycle power*>
- 8) From PC 1, bring up Internet Explorer.
- 9) In Internet explorer, put the following in the address field:
 - a. `http://192.168.24.1`
- 10) Follow the <S/W Config> link to the configuration page.
- 11) Configure a Service Class: A few default service classes are configured automatically. One of these may be sufficient for your needs and this step can be skipped.
 - a. Schedule Type = Best Effort, Latency = 80, Jitter = 20, Priority = 1
 - b. SC 1: (Name = “Gold”, Max Rate = 50,000 Kbps, Min Rate = 1,000 Kbps)
- 12) Now configure 2 Provisioned Service Flows (upstream and downstream) for the PCs and specify the desired bandwidth by choosing the appropriate service class. In bridging mode the MAC addresses in the service flows should be the one of the subscriber station. One can remove any existing service flows that are not being used prior to configuring additional ones.
 - a. SF 1: (SF Index = 4, MAC= 00 61 65 6e 64 01, Direction=Upstream, Service Class = Gold, State = Provisioned)
 - b. SF 2: (SF Index = 5, MAC= 00 61 65 6e 64 01, Direction=Downstream, Service Class = Gold, State = Provisioned)
- 13) Remove any existing classifiers then configure the classifiers. The classifiers allow data to flow through the system across the specified service flows. Shown below are the classifiers for the upstream and downstream service flows configured previously. This example shows the configuration of classifiers using MAC addresses. The SF Index must match the SF Index of the corresponding service flow.
 - a. Class 1: (SF Index = 4, Src Mac = 22 aa cc 55 2a 78, Dst Mac = 22 aa cc 55 2a 56, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - b. Class 2: (SF Index = 5, Src Mac = 22 aa cc 55 2a 56, Dst Mac = 22 aa cc 55 2a 78, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
- 14) Follow the <Radio Control> Link.
- 15) Select the desired channel from the Channel (Freq) drop down menu. One should select a frequency that is in the same band as power head being used.
- 16) Click the Set button next to the drop down.
- 17) Set Tx/Rx to ON if it is not.
- 18) Configure the Tx gain and hit the corresponding set button.
- 19) Enable or disable TRANSEC.
- 20) If TRANSEC is enabled, enter the KEY and hit the corresponding Load Now button or make no changes and run with the default key.

- 21) Click the Save Settings button to save the newly selected values to the database.
- 22) Proceed to SS configuration.

5.3 Bridging Subscriber Station Configuration Mode

1. Turn Power ON.
2. Connect to Users Port with terminal emulator. (Baud = 115200, 8-N-1 no flow control)
3. \$ cp startShimBridgeSS start
4. \$ cd /mnt/jffs2
5. \$ vi start
 - a. Change ifconfig line to use desired IP address“192.168.24.2”
 - b. Change this line ‘insmod macss.ko subscriberNumber=1’ to = the desired subscriber number
 - c. Save file.
6. If you have upgraded to a release of code that has database changes, now is the time to remove you old databases. Please refer to the release notes of each release to determine if a remove of the database is necessary. If removal is necessary, type:

```
rm /mnt/jffs2/database/*
```
7. Reboot the unit by typing “reboot” at the console prompt or power cycle the unit.
8. From PC 2, bring up an Internet browser. Make sure you have configured the PC network parameters.
9. In the browser, put the following in the address field:
 - a. <http://192.168.24.2>
10. Follow the <Radio Control> Link.
11. Select the desired channel from the Channel (Freq) drop down menu. The channel should match that of the base station.
12. Set Tx/Rx to ON.
13. Enable or disable TRANSEC to match the selection of the base station.
14. If TRANSEC is enabled, enter the KEY and hit the corresponding Load Now button or make no changes and run with the default key.
15. Click the Save Settings button to save the newly selected values to the database

5.3.1 Bridging Base Station Configuration Mode with two subscribers

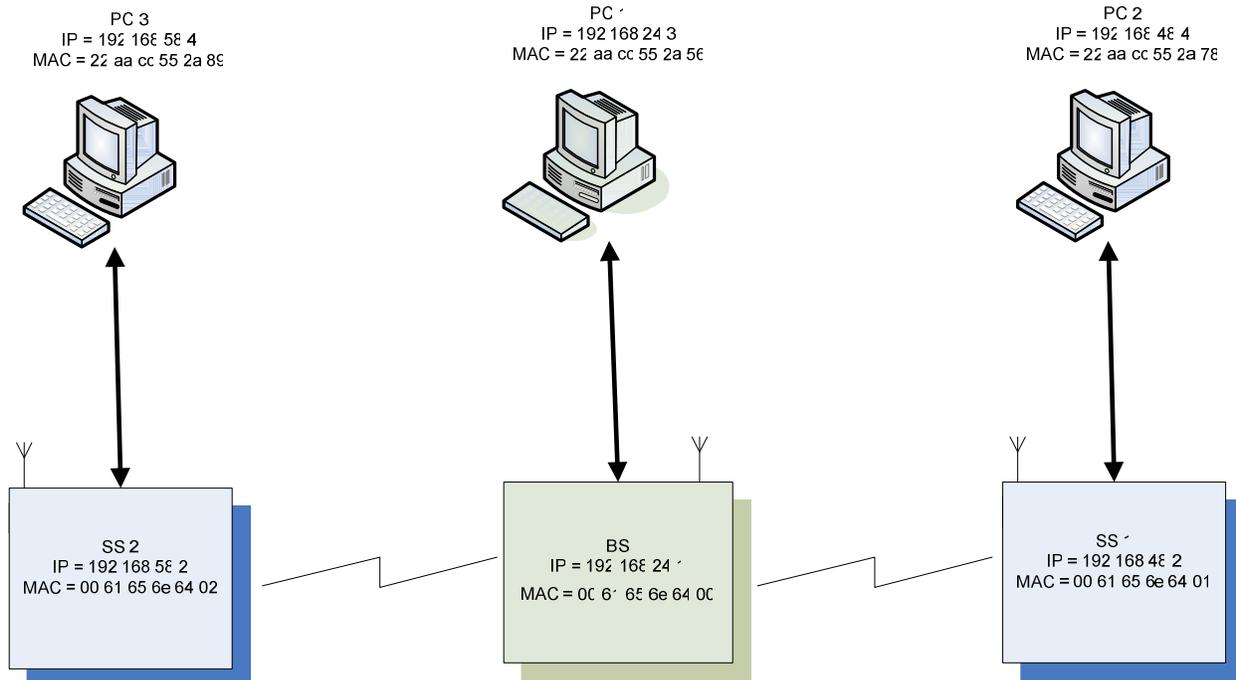


Figure 13.1 Example Bridging Setup Scenario 2 subscribers

- 1) Turn AER16 Power ON.
- 2) Connect to AER16 Users Port with terminal emulator. (Baud = 115200, 8-N-1 no flow control)
- 3) `$ cd /mnt/jffs2`
- 4) `$ cp startShimBridgeBS start`
- 5) `$ vi start`
 - a. Change ifconfig line to use desired IP address "192.168.24.1"
 - b. Save file.
- 6) If you have upgraded to a release of code that has database changes, now is the time to remove your old databases. Please refer to the release notes of each release to determine if a remove of the database is necessary.


```
rm /mnt/jffs2/database/*
```
- 7) Open shell to radio and execute "reboot" to reboot the radio. *< reboot the machine or cycle power >*
- 8) From PC 1, bring up Internet Explorer.
- 9) In Internet explorer, put the following in the address field:
 - a. `http://192.168.24.1`
- 10) Follow the `<S/W Config>` link to the configuration page.

- 11) Configure a Service Class: A few default service classes are configured automatically. One of these may be sufficient for your needs and this step can be skipped.
- Schedule Type = Best Effort, Latency = 80, Jitter = 20, Priority = 1
 - SC 1: (Name = "Gold", Max Rate = 50,000 Kbps, Min Rate = 1,000 Kbps)
- 12) Now configure 2 Provisioned Service Flows (upstream and downstream) for the PCs and specify the desired bandwidth by choosing the appropriate service class. In bridging mode the MAC addresses in the service flows should be the one of the subscriber station. One can remove any existing service flows that are not being used prior to configuring additional ones.
- SF 1: (SF Index = 4, MAC= 00 61 65 6e 64 01, Direction=Upstream, Service Class = Gold, State = Provisioned)
 - SF 2: (SF Index = 5, MAC= 00 61 65 6e 64 01, Direction=Downstream, Service Class = Gold, State = Provisioned)
 - SF 1: (SF Index = 6, MAC= 00 61 65 6e 64 02, Direction=Upstream, Service Class = Gold, State = Provisioned)
 - SF 2: (SF Index = 7, MAC= 00 61 65 6e 64 02, Direction=Downstream, Service Class = Gold, State = Provisioned)
- 13) Remove any existing classifiers then configure the classifiers. The classifiers allow data to flow through the system across the specified service flows. Shown below are the classifiers for the upstream and downstream service flows configured previously. This example shows the configuration of classifiers using MAC addresses. The SF Index must match the SF Index of the corresponding service flow.
- Class 1: (SF Index = 4, Src Mac = 22 aa cc 55 2a 78, Dst Mac = 22 aa cc 55 2a 56, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 2: (SF Index = 5, Src Mac = 22 aa cc 55 2a 56, Dst Mac = 22 aa cc 55 2a 78, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 3: (SF Index = 6, Src Mac = 22 aa cc 55 2a 89, Dst Mac = 22 aa cc 55 2a 56, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 4: (SF Index = 7, Src Mac = 22 aa cc 55 2a 56, Dst Mac = 22 aa cc 55 2a 89, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 5: (SF Index = 4, Src Mac = 22 aa cc 55 2a 78, Dst Mac = 22 aa cc 55 2a 89, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 6: Check forward flag (SF Index = 5, Src Mac = 22 aa cc 55 2a 89, Dst Mac = 22 aa cc 55 2a 78, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 7: (SF Index = 6, Src Mac = 22 aa cc 55 2a 89, Dst Mac = 22 aa cc 55 2a 78, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - Class 8: Check forward flag (SF Index = 7, Src Mac = 22 aa cc 55 2a 78, Dst Mac = 22 aa cc 55 2a 89, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
- 14) Follow the <Radio Control> Link.
- 15) Select the desired channel from the Channel (Freq) drop down menu. One should select a frequency that is in the same band as power head being used.
- 16) Click the Set button next to the drop down.

- 17) Set Tx/Rx to ON if it is not.
- 18) Configure the Tx gain and hit the corresponding set button.
- 19) Enable or disable TRANSEC.
- 20) If TRANSEC is enabled, enter the KEY and hit the corresponding Load Now button or make no changes and run with the default key.
- 21) Click the Save Settings button to save the newly selected values to the database.
- 22) Proceed to SS configuration.

5.4 Non-Bridging Mode Scenario

Setup a simple BS – SS non-bridging configuration with one external network node on the SS and on external node on the BS. For a user scenario you should substitute user’s addresses for BS, SS, PC1, and PC2.

In the non-bridging mode, use of internal MAC addresses is required. For the current radios the BS MAC is 00:61:65:6e:64:00 and SS MAC is 00:61:65:6e:64:nn where nn equals the subscriber number configured in the start script.

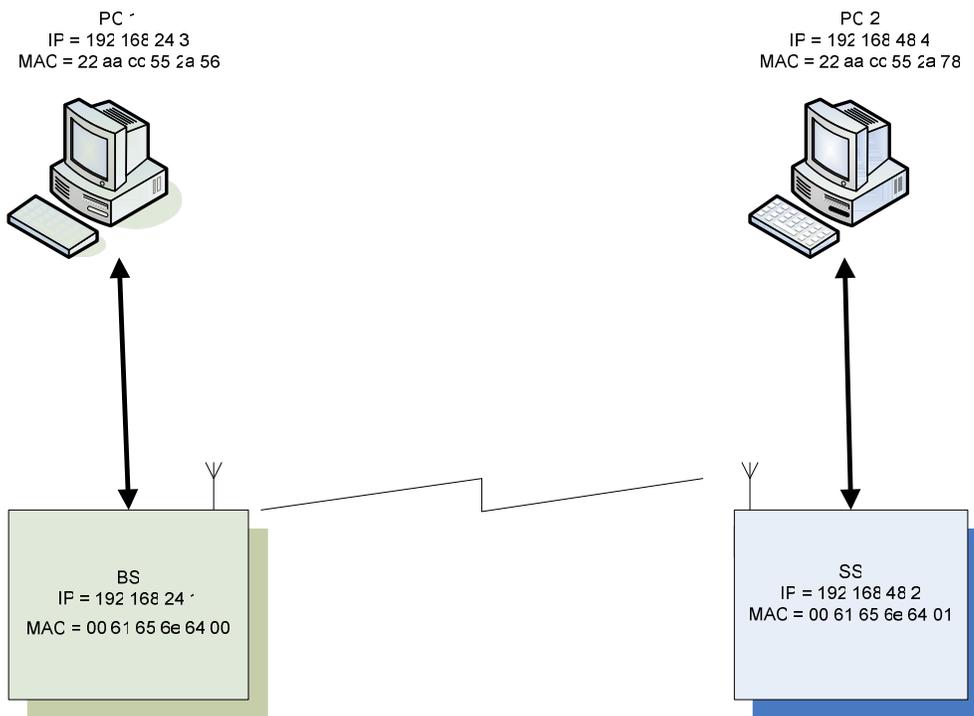


Figure 14. Example Non-Bridging Setup Scenario

5.5 Non-Bridging Base Station Configuration Mode

1. Turn AER16 Power ON.
2. Connect to AER16 Users Port with terminal emulator. (Baud = 115200, 8-N-1 no flow control)
3. `$ cd /mnt/jffs2`
4. `$ cp startShimBS start`
5. `$ vi start`
 - a. Change 'ifconfig eth0' line to use desired IP address "192.168.24.1"
 - b. Modify the "route add" line to have the appropriate -net address. For the net address use "192.168.48.0".
 - c. Save file.
6. If you have upgraded to a release of code that has database changes, now is the time to remove you old databases. Please refer to the release notes of each release to determine if a removal of the database is necessary. If removal is necessary, type:
`rm /mnt/jffs2/database/*`
7. Reboot the unit by typing "reboot" at the console prompt or power cycle the unit.
8. From PC 1, bring up an Internet browser. Make sure you have configured the PC network parameters.
9. In the browser, put the following in the address field:
 - a. `http://192.168.24.1`
10. Follow the <S/W Config> link to the configuration page.
11. Configure a Service Class: A few default service classes are configured automatically. One of these may be sufficient for your needs and this step can be skipped.
 - a. Schedule Type = Best Effort, latency = 80, Jitter = 20, Priority = 1
 - b. SC 1: (Name = "Gold", Max Rate = 50,000 Kbps, Min Rate = 1,000 Kbps)
12. Now configure 2 Provisioned Service Flows (upstream and downstream) for the PCs and specify the desired bandwidth by choosing the appropriate service class if they do not already exist. To display the MAC address of the radio, open a shell and execute "ifconfig | more".
 - a. SF 1: (SF Index = 4, MAC= 00 61 65 6e 64 01, Direction=Upstream, Service Class = Gold, State = Provisioned)
 - b. SF 2: (SF Index = 5, MAC= 00 61 65 6e 64 01, Direction=Downstream, Service Class = Gold, State = Provisioned)
13. Remove any existing classifiers that are not needed and then configure the classifiers. Classifiers allow data to flow through the system across the specified service flows. Below are the classifiers for the upstream and downstream service flows configured using MAC addresses. The SF Index must match the SF Index of the corresponding service flow.
 - a. Class 1: (SF Index = 4, Src Mac = 00 61 65 6e 64 01, Dst Mac = 00 61 65 6e 64 00, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)

- b. Class 2: (SF Index = 5, Src Mac = 00 61 65 6e 64 00, Dst Mac = 00 61 65 6e 64 01, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
14. Follow the <Radio Control> Link.
15. Select the desired channel from the Channel (Freq) drop down menu.
16. Click the Set button next to the drop down.
17. Set Tx/Rx to ON if it is not.
18. Configure the max distance for SS acquisition.
19. Click the set button in the ranging environment section of the Radio Control screen.
20. Enable or disable TRANSEC.
21. If TRANSEC is enabled, enter the KEY and hit the corresponding Load Now button or make no changes and run with the default key.
22. Click the Save Settings button to save the newly selected values to the database.
23. Proceed to SS configuration.

5.6 Non-Bridging Subscriber Station Configuration Mode

1. Turn Power ON.
2. Connect to Users Port with terminal emulator. (Baud = 115200, 8-N-1 no flow control)
3. `$ cd /mnt/jffs2`
4. `$ cp startShimSS start`
5. `vi start`
 - a. Change 'ifconfig eth0' line to use desired IP address "192.168.48.2"
 - b. Change this line 'insmod macss.ko subscriberNumber=1' to = the desired subscriber number. If multiple subscribers increase number accordingly.
 - c. Modify the "route add" line to have the appropriate -net address. For the net address use "192.168.24.0".
 - d. Save the file.
6. If you have upgraded to a release of code that has database changes, now is the time to remove you old databases. Please refer to the release notes of each release to determine if a remove of the database is necessary. If removal is necessary, type:
`rm /mnt/jffs2/database/*`
7. Reboot the unit by typing "reboot" at the console prompt or power cycle the unit.
8. From PC 2, bring up an Internet browser. Make sure you have configured the PC network parameters.
9. In the browser, put the following in the address field:
 - a. `http://192.168.48.2`
10. Follow the <Radio Control> Link.
11. Select the desired channel from the Channel (Freq) drop down menu. The channel should match that of the base station.
12. Set Tx/Rx to ON.
13. Enable or disable TRANSEC to match the selection of the base station.
14. If TRANSEC is enabled, enter the KEY and hit the corresponding Load Now button or make no changes and run with the default key.
15. Click the Save Settings button to save the newly selected values to the database.

5.6.1 Non-Bridging Base Station Configuration Mode with Two subscribers

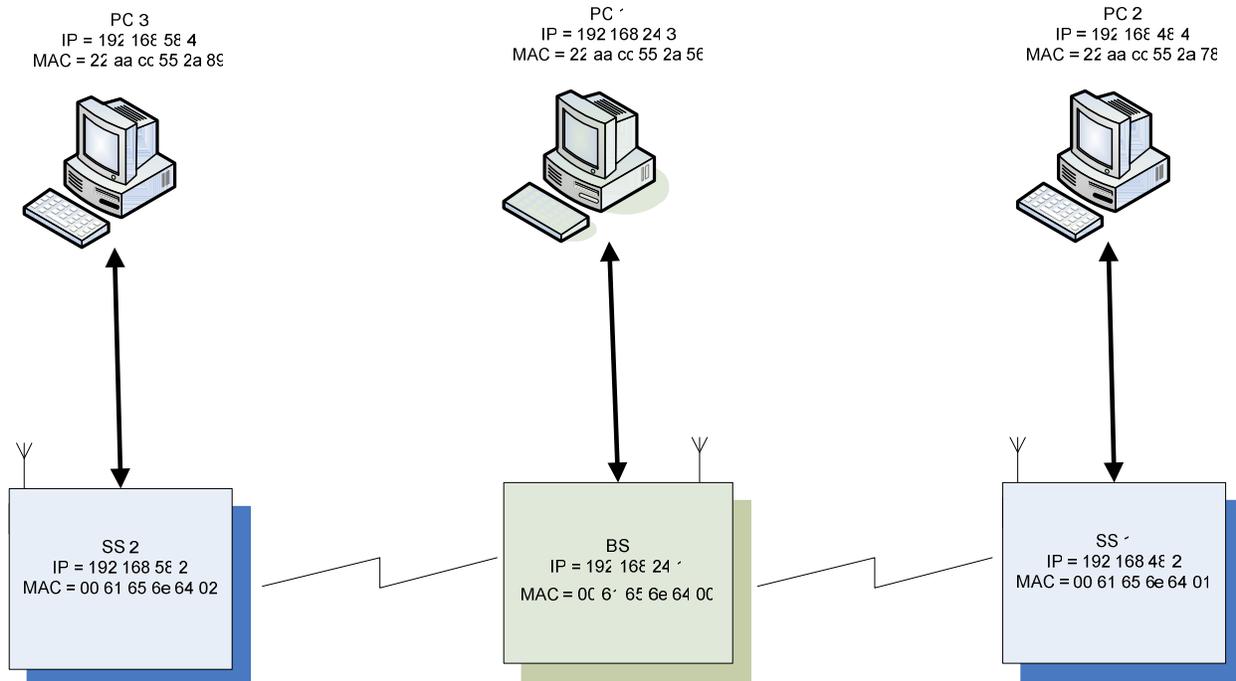


Figure 14.1 Non –Bridging Example with 2 Subscribers

1. Turn AER16 Power ON.
2. Connect to AER16 Users Port with terminal emulator. (Baud = 115200, 8-N-1 no flow control)
3. `$ cd /mnt/jffs2`
4. `$ cp startShimBS start`
5. `$ vi start`
 - a. Change 'ifconfig eth0' line to use desired IP address "192.168.24.1"
 - b. Modify the "route add" line to have the appropriate -net address. For the net address use "192.168.48.0".
 - c. Save file.
6. If you have upgraded to a release of code that has database changes, now is the time to remove you old databases. Please refer to the release notes of each release to determine if a removal of the database is necessary. If removal is necessary, type:


```
rm /mnt/jffs2/database/*
```
7. Reboot the unit by typing "reboot" at the console prompt or power cycle the unit.
8. From PC 1, bring up an Internet browser. Make sure you have configured the PC network parameters.
9. In the browser, put the following in the address field:

- a. <http://192.168.24.1>
10. Follow the <S/W Config> link to the configuration page.
11. Configure a Service Class: A few default service classes are configured automatically. One of these may be sufficient for your needs and this step can be skipped.
 - 1) Schedule Type = Best Effort, latency = 80, Jitter = 20, Priority = 1
 - 2) SC 1: (Name = “Gold”, Max Rate = 50,000 Kbps, Min Rate = 1,000 Kbps)
12. Now configure 2 Provisioned Service Flows (upstream and downstream) for the PCs and specify the desired bandwidth by choosing the appropriate service class if they do not already exist. To display the MAC address of the radio, open a shell and execute “ifconfig | more”.
 - a. SF 1: (SF Index = 4, MAC= 00 61 65 6e 64 01, Direction=Upstream, Service Class = Gold, State = Provisioned)
 - b. SF 2: (SF Index = 5, MAC= 00 61 65 6e 64 01, Direction=Downstream, Service Class = Gold, State = Provisioned)
 - c. SF 1: (SF Index = 6, MAC= 00 61 65 6e 64 02, Direction=Upstream, Service Class = Gold, State = Provisioned)
 - d. SF 2: (SF Index = 7, MAC= 00 61 65 6e 64 02, Direction=Downstream, Service Class = Gold, State = Provisioned)
13. Remove any existing classifiers that are not needed and then configure the classifiers. Classifiers allow data to flow through the system across the specified service flows. Below are the classifiers for the upstream and downstream service flows configured using MAC addresses. The SF Index must match the SF Index of the corresponding service flow.
 - a. Class 1: (SF Index = 4, Src Mac = 00 61 65 6e 64 01, Dst Mac = 00 61 65 6e 64 00, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - b. Class 2: (SF Index = 5, Src Mac = 00 61 65 6e 64 00, Dst Mac = 00 61 65 6e 64 01, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - c. Class 3: (SF Index = 6, Src Mac = 00 61 65 6e 64 02, Dst Mac = 00 61 65 6e 64 00, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - d. Class 4: (SF Index = 7, Src Mac = 00 61 65 6e 64 00, Dst Mac = 00 61 65 6e 64 02, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - e. Class 5: (SF Index = 4, Src Mac = 00 61 65 6e 64 01, Dst Mac = 00 61 65 6e 64 02, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - f. Class 6: Check forward flag (SF Index = 5, Src Mac = 00 61 65 6e 64 02, Dst Mac = 00 61 65 6e 64 01, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - g. Class 5: (SF Index = 6, Src Mac = 00 61 65 6e 64 02, Dst Mac = 00 61 65 6e 64 01, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
 - h. Class 6: Check forward flag (SF Index = 7, Src Mac = 00 61 65 6e 64 01, Dst Mac = 00 61 65 6e 64 02, Src Mask = ff ff ff ff ff ff, Dst Mask = ff ff ff ff ff ff)
14. Follow the <Radio Control> Link.
15. Select the desired channel from the Channel (Freq) drop down menu.
16. Click the Set button next to the drop down.

17. Set Tx/Rx to ON if it is not.
18. Configure the max distance for SS acquisition.
19. Click the set button in the ranging environment section of the Radio Control screen.
20. Enable or disable TRANSEC.
21. If TRANSEC is enabled, enter the KEY and hit the corresponding Load Now button or make no changes and run with the default key.
22. Click the Save Settings button to save the newly selected values to the database.
23. Proceed to SS configuration.

6.0 PERFORMANCE

Radio Performance

The 802.16 Radio meets or exceeds the performance parameters listed in Table 6-1.

Table 6-1. Modem Performance			
Parameter	Value		Units
Band 1 Channel Center Frequencies	5.745, 5.765, 5.785, 5.805, 5.825	+/- 1 ppm @ 25 °C	GHz
Band 2 Channel Center Frequencies	4.52, 4.54, 4.56, 4.58, 4.6, 4.62, 4.64, 4.66, 4.68	+/- 1.5 ppm -40 °C to +70 °C	GHz
Transmitter:	25 °C	-40 °C to +70 °C	
Average (RMS) Output Power	0 +/-1dB		dBm
Peak Output Power	+27 +/-1dB	25 °C value - 3dBm/+1.5dBm	dBm
Transmit 1dB Output Compression	+37		dBm
VSWR	2:1		
Channel Bandwidth	15.6		MHz
LO leakage	15.3		dBm
Receiver:			
Input Damage Level	13		dBm
Input 1 dB compression ¹	-7.8	-9.4 to -6.4	dBm
Input 1 dB compression ²	-6.4	-7.2 to -5.7	dBm
Input Third Order Intercept ¹	3	2 to 4.7	dBm
Input Third Order Intercept ²	7.8	6.9 to 8.5	dBm
LO leakage	-25		dBm
VSWR	2:1		
Noise Figure	8 db Max	25 °C value +/- 1 dB	dB

¹ With front end attenuator off

² With front end attenuator on

6.1 Receiver Sensitivity

The sensitivity of the 802.16 Modem Module receiver conforms to Section 8.3.11.1 of the IEEE 802.16D5-2004 specification. The receiver Signal to Noise Ratio (SNR) assumptions are listed in Table 6-2.

Table 6-2. Receiver SNR Assumptions			
Modulation	Coding Rate	Receiver SNR (dB)	Receiver Sensitivity (8dB NF & 5dB IL)
BPSK	1/2	6.4	-85.6 dBm
QPSK	1/2	9.4	-82.6 dBm
	3/4	11.2	-80.8 dBm
16 QAM	1/2	16.4	-75.6 dBm
	3/4	18.2	-73.8 dBm
64 QAM	2/3	22.7	-69.3 dBm
	3/4	24.4	-67.6 dBm

6.2 User Data Rates

The 802.16 Modem Module PHY modulates and de-modulates the data packets as specified in Table 5-3 . The user throughput for the 10 MHz and 20 MHz bandwidths can be found in Table

Table 6-3. User Data Rates 10 MHz 20 MHz Bandwidth									
Modulation	Cyclic prefix	Uncoded block size (bytes/symbol)	Coded block size (bytes)	Overall coding rate	RS code	CC code rate	10MHz BW Burst Data rate (Mbs)	20 MHz BW Burst Data rate (Mbs)	SNR Eb/No
BPSK	1/4	4	24	1/6	(12,4,4)	1/2	1	2	
BPSK	1/4	12	24	1/2	None	1/2	3	6	6.4
BPSK	1/4	24	24	NA	None	NA	6	12	11(est)
QPSK	1/4	24	48	1/2	(32,24,4)	2/3	6	12	9.4
QPSK	1/4	36	48	3/4	(40,36,3)	5/6	10	18	11.2
QPSK	1/4	48	48	NA	None	NA	13	24	14(est)
16-QAM	1/4	48	96	1/2	(64,48,8)	2/3	13	24	16.4
16-QAM	1/4	72	96	3/4	(80,72,4)	5/6	20	36	18.2
16-QAM	1/4	96	96	NA	None	NA	27	48	19(est)
64-QAM	1/4	96	144	2/3	(108,96,6)	3/4	27	48	22.7
64-QAM	1/8	96	144	2/3	(108,96,6)	3/4	30	53.33	22.7
64-QAM	1/8	108	144	3/4	(120,108,6)	5/6	34	60	24.4
64-QAM	1/16	108	144	3/4	(120,108,6)	5/6	36	63.53	24.4
64-QAM	1/32	108	144	3/4	(120,108,6)	5/6	37	65.45	24.4
64-QAM	1/4	144	144	NA	None	NA	41	72	25(est)
8PSK	1/4	32	72	8/18	(48,32,8)	2/3	9	16	
8PSK	1/4	42	72	7/12	(54,42,6)	3/4	12	21	
8PSK	1/4	72	72	NA	None	NA	20	36	
16PSK	1/4	48	96	1/2	(64,48,8)	2/3	13	24	
16PSK	1/4	72	96	3/4	(80,72,4)	5/6	20	36	
16PSK	1/4	96	96	NA	None	NA	27	48	

Table 5-5 User Throughput for 10 MHz Channel Bandwidth vs Number of Nodes in the Network

Modulation	Coded Link Rate	1 Node Link Thruput Mb/s	2 Node Link Thruput Mb/s	3 Node Link Thruput Mb/s	4 Node Link Thruput Mb/s	5 Node Link Thruput Mb/s	6 Node Link Thruput Mb/s	7 Node Link Thruput Mb/s	8 Node Link Thruput Mb/s	9 - 20 Node Link Thruput Mb/s
BPSK 1/2	6 Mbps	2.6	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.3
QPSK 1/2	12 Mbps	5.1	5.0	5.0	4.9	4.9	4.8	4.8	4.7	4.7
QPSK 3/4	18 Mbps	7.6	7.5	7.4	7.4	7.3	7.2	7.1	7.1	7.0
16-QAM 1/2	24 Mbps	10.2	10.1	10.0	9.9	9.8	9.7	9.6	9.5	9.4
16-QAM 3/4	36 Mbps	15.3	15.1	15.0	14.8	14.7	14.5	14.4	14.2	14.1
64-QAM 2/3	48 Mbps	20.4	20.2	20.0	19.8	19.6	19.4	19.2	19.0	18.8
64-QAM 3/4	54 Mbps	23.0	22.7	22.5	22.3	22.0	21.8	21.6	21.3	21.1
8-PSK 1/2	18 Mbps	7.7	7.6	7.5	7.4	7.3	7.3	7.2	7.1	7.0
16-PSK 1/2	24 Mbps	10.2	10.1	10.0	9.9	9.8	9.7	9.6	9.5	9.4
16-PSK 3/4	36 Mbps	15.3	15.1	15.0	14.8	14.7	14.5	14.4	14.2	14.1

Table 5-4 User Throughput for 20 MHz Channel Bandwidth vs Number of Nodes in the Network

Modulation	Coded Link Rate	1 Node Link Thruput Mb/s	2 Node Link Thruput Mb/s	3 Node Link Thruput Mb/s	4 Node Link Thruput Mb/s	5 Node Link Thruput Mb/s	6 Node Link Thruput Mb/s	7 Node Link Thruput Mb/s	8 Node Link Thruput Mb/s	9 - 20 Nodes Link Thruput Mb/s
BPSK 1/2	6 Mbps	5.1	5.0	5.0	4.9	4.9	4.8	4.8	4.7	4.7
QPSK 1/2	12 Mbps	10.2	10.1	10.0	9.9	9.8	9.7	9.6	9.5	9.4
QPSK 3/4	18 Mbps	15.2	15.0	14.9	14.7	14.6	14.4	14.3	14.1	14.0
16-QAM 1/2	24 Mbps	20.4	20.2	20.0	19.8	19.6	19.4	19.2	19.0	18.8
16-QAM 3/4	36 Mbps	30.6	30.3	30.0	29.7	29.4	29.1	28.8	28.5	28.2
64-QAM 2/3	48 Mbps	40.8	40.4	40.0	39.6	39.2	38.8	38.4	37.9	37.5
64-QAM 3/4	54 Mbps	45.9	45.4	45.0	44.5	44.1	43.6	43.1	42.7	42.2
8-PSK 1/2	18 Mbps	15.3	15.1	15.0	14.8	14.7	14.5	14.4	14.2	14.1
16-PSK 1/2	24 Mbps	20.4	20.2	20.0	19.8	19.6	19.4	19.2	19.0	18.8
16-PSK 3/4	36 Mbps	30.6	30.3	30.0	29.7	29.4	29.1	28.8	28.5	28.2

APPENDIX: DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

The section provides the necessary definitions, acronyms, and abbreviations relevant to this document and necessary in order to understand this document.

ACID – ARQ Channel ID

ARQ – Automatic Repeat Request

ATM – Asynchronous Transfer Mode

Authentication – Verification of the source of information

BS – Base Station

CCV – Clock Comparison Value

CDMA – Code Division Multiple Access

CID – Connection Identifier

CINR – Carrier to Interference and Noise Ratio

CS – Convergence Sub-layer

DCD – Downlink Channel Descriptor

DFS – Dynamic Frequency Selection

DIUC – Downlink Interval Usage Code

DL – Downlink

EIRP – Effective Isotropic Radiated Power

GPS – Global Positioning System

H-ARQ – Hybrid Automatic Repeat Request

HMAC – Hashed Message Authentication Code

HW – Hardware

Instantiate – Create an entity from an abstraction.

Integrity – Verification that the information has not been altered.

I/O – Input/Output

IP – Internet Protocol

JTRS – Joint Tactical Radio System

MAC – Media Access Control

MSB – Most Significant Bit

OFDM – Orthogonal Frequency Division Multiplexing

OFDMA – Orthogonal Frequency Division Multiple Access

OS – Operating System

PDU – Payload Data Unit
PHS – Payload Header Suppression
PHY – Physical Layer
PKM – Privacy Key Management
QoS – Quality of Service
RSSI – Received Signal Strength Indicator
RTG – Receive/Transmit Transition Gap
SDU – Service Data Unit
SFID – Service Flow ID
SS – Subscriber Station
SW – Software
TCP – Transmission Control Protocol
TLV – Type Length Value
TRANSEC – Transmission Security
TTG – Transmit/Receive Transition Gap
UCD – Uplink Channel Descriptor
UDP – User Datagram Protocol
UIUC – Uplink Interval Usage Code
UL - Uplink
VLAN – Virtual Local Area Network