

JLT733A User Manual

Version 1.0 Rev. 8

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Revision History

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1 Introduction

1.1 Overview

JLT733A is Pico LTE small cell. LTE small cell is a wireless network system based on 3GPP LTE (Long Term Evolution) technology; LTE small cell improves 3G technology's shortcomings of relatively slow transmission speed with high cost. This new generation wireless network system provides high speed data throughput with relatively economic cost using the existing Internet line or low cost backhaul.

1.2 Type of Small Cell

LTE small cell has a core similarity with WiFi technology where both system provide wireless traffic in residential and hotspots as inFigure 1. Difference is that WiFi uses ISM band while LTE small cell uses commercial frequency band operating within the commercial LTE network. Generally, small cell can easily be installed like WiFi AP while Picocell is recommended to be installed after cell planning by wireless operators.

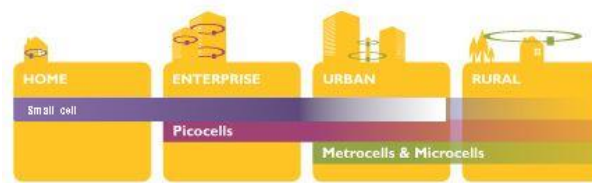


Figure 1: Types of Small Cell

1.3 Benefits

To satisfy the customer needs, LTE system must provide fast packet transmission with low cost to support high speed multimedia data service. With LTE small cell deployment, existing public Internet network can be shared wirelessly, thus it can offload the data traffic as Wi-Fi does. It can also provide the coverage extension effect with providing LTE service inside the buildings. The high efficiency with low cost makes the LTE small cell attractive to wireless operator to create new business model. Therefore, it brings better service experience to their customers.



Figure 2: Benefits of Small Cell

1.4 Network Block Diagram

Pico LTE small cell, JLT733A, provides wireless access to LTE UE, and it is connected to MME (Mobility Management Entity) for control plane signaling via S1-MME logical interface. For the user data service, JLT733A is connected to S-GW (Serving-Gateway) via S1-U logical interface. Connection between EPC and LTE small cells may go through HeNB-GW instead of directly getting connected to EPC. S-GW is connected to P-GW (PDN-Gateway) for external network access including Internet service.

JLT733A supports IPSec with Security-GW when it is deployed in public network. It carries out either USIM-based or Certificate-based authentication procedure for creating IPSec tunnel to Security-GW located in front of HeNB-GW. Security-GW may co-locate with HeNB-GW. In addition, it has been proved in the field to work seamlessly with our cutting-edge management system HeMS and SON server for plug and play-based configuration including automatic parameter setting, alarm reporting, statistics gathering and interference mitigation.

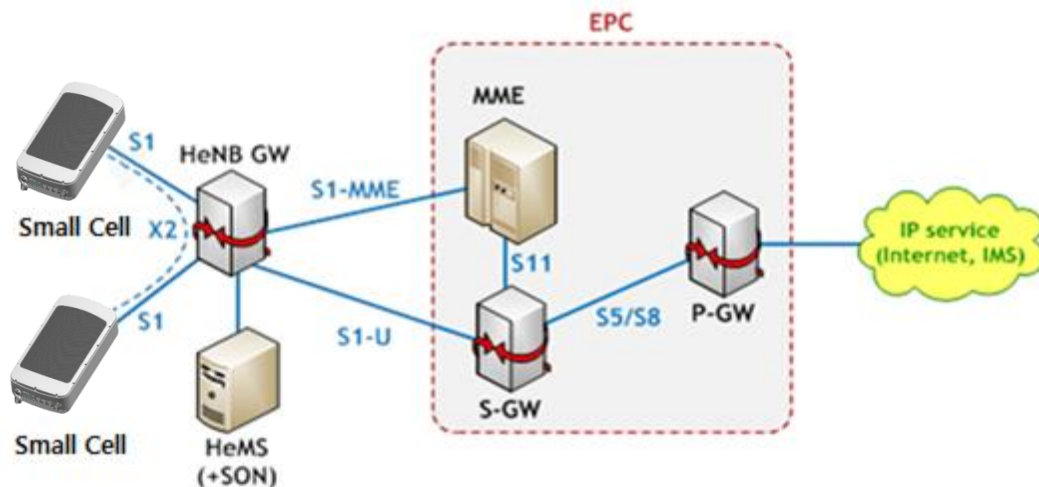


Figure 3: JLT733A and EPC Network Diagram

2 System Features

The JLT733A is Pico Base Station which supports a wide range of LTE interfaces. It provides an ideal cost-effective alternative to macro deployments for coverage and capacity needs, suitable for vertical market business including smart grid network and services at railways, campuses, mines, oil drilling sites, bay area, and harbors.

2.1 JLT733A System Main Functions

2.1.1 3GPP Standards

JLT733A supports 3GPP Release 10 and complies with following specifications.

TS Number	Title
32.453	Telecommunication management; Performance Management (PM); Performance measurements Home enhanced Node B (HeNB) Subsystem (HeMS).
32.425	Telecommunication management; Performance Management (PM); Performance measurements Evolved Universal Terrestrial Radio Access Network (E-UTRAN)
32.592	Telecommunication management; Home enhanced Node B (HeNB) Operations, Administration, Maintenance and Provisioning (OAM&P); Information model for Type 1 interface HeNB to HeNB Management System (HeMS)
32.593	Telecommunication management; Home enhanced Node B (HeNB) Operations, Administration, Maintenance and Provisioning (OAM&P); Procedure flows for Type 1 interface HeNB to HeNB Management System (HeMS)
32.594	Telecommunication management; Home enhanced Node B (HeNB) Operations, Administration, Maintenance and Provisioning (OAM&P); XML definitions for Type 1 interface HeNB to HeNB Management System (HeMS)
32.541	Telecommunication management; Self-Organizing Networks (SON); Self-healing concepts and requirements
36.104	Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception
36.211	Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation
36.212	Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding
36.213	Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures
36.214	Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements
36.300	Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial

	Radio Access Network (E-UTRAN); Overall description; Stage 2
36.314	Evolved Universal Terrestrial Radio Access (E-UTRA); Layer 2 – Measurements
36.321	Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification
36.322	Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification
36.323	Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification
36.331	Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification
36.412	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 signaling transport
36.413	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)
36.414	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 data transport
36.422	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 signaling transport
36.423	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 Application Protocol (X2AP)
36.424	Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 data transport
29.281	General Packet Radio System (GPRS) Tunneling Protocol User Plane (GTPv1-U)
33.401	3GPP System Architecture Evolution (SAE); Security architecture

Table 1: 3GPP Release 10 Standard Specifications

2.2 JLT733A System Specifications

JLT733A system specifications are described in Table 2.

Item	System specifications	Remarks
Supporting standards	3GPP Release 10 specified in Table 1	
Interface	S1-U / S1-MME / X2-CP / X2-U	
Access type	Open / Closed	
Synchronization	IEEE 1588v2 (optional), GPS, Air Sync (In-band)	
SON	Sniffing, Optimal output transmission, Automatic PCI allocation, EARFCN allocation, ANR	
Data service	PS, SMS, MMS, Video call	
Voice service	VoLTE, CSFB, Emergency calling	
Handover	S1 / X2 Handover	
Redirection	To UTRAN and GERAN	

Table 2: System Specification

2.3 JLT733A Main Functions

Main functions provided by JLT733A are listed in the Table 3.

Category	Functions
Initial Access	Attach / Detach
	Tracking Area Update
E-RAB	E-RAB Setup
	E-RAB Release
	E-RAB Modify
S1AP	S1AP- Reset
	S1AP- Setup
	S1AP- MME Configuration Update
	S1AP- eNB Configuration Update

X2AP	X2AP – Reset
	X2AP – Setup
	X2AP –eNB Configuration Update
Broadcast Message	MIB
	SIB1,SIB2,SIB3,SIB4,SIB5,SIB6, SIB7, SIB9, SIB10, SIB11, SIB12
PHY	DL / UL HARQ
	2x2 MIMO
Scheduler	RR (Round-Robin)
	PF (Proportional Fairness)
Supporting services	Data service
	Voice service (VoLTE)
	Video service
	SMS, MMS
	International roaming
PWS	CMAS, ETWS
Handover	S1 Handover
	X2 Handover
2G / 3G Interworking	CSFB w / o SI, Blind redirection
Neighbor Management	Manual Neighbor Management
	ANR (Automatic Neighbor Relation) function based on UE's measurement report
	ANR function based on built-in REM function (under development)
Security	Small cell authentication function (USIM-based, Certificate-based)
	Tunneling function to Security-GW (Se-GW)
	Encryption between UE and small cell, message integrity function
SON	Plug and play, ANR, automatic PCI, EARFCN and TAC allocation (under development)
Synchronization	IEEE 1588v2 (optional), GPS, Air Sync (In-band)

Table 3: Main Functions

2.4 Equipment Specifications

Item	Specification	Remarks
Active Users	100 Users	128 Users in the future
Bandwidth	10 / 20MHz	
WAN	RJ-45, 100/1000 BASE-T	
MGMT	RJ-45, 100/1000 BASE-T	
Integrated LTE Antenna	14dBi (Max)	Patch Antenna
Integrated GPS Antenna	RHCP	
Power Consumption	85W (TBD)	Max.
Rated Input Voltage	100 – 240Vac	
Dimension	543(W) x 310.8(H) x 149(D) mm Without Bracket	21.4(W) x 12.2(H) x 5.9(D) in Without Bracket
Volume	25.15 Liter	
Weight	16.0Kg (TBD) Without Bracket	35.2lb (TBD) Without Bracket
Material	Aluminum + ASA	
IP Grade	IP67	
Cooling	Nature Convection	

Table 4: System Specifications

2.5 Environmental Specifications

Item	Specification	Remarks
Operating Temp.	-30 – 55 °C	-22 – 131
Operating Humidity	0 – 95%	
Storage Temp.	-40 – 70 °C	-40 – 158
Storage Humidity	0 – 95%	

Table 5: Environmental Specifications

2.6 RF Specifications

2.6.1 Downlink transmission (for 20MHz BW)

Item	Specification	Remarks
Frequency Range	Band 48	20MHz Channel
Maximum Output Power (per 10 and 20MHz Channels)	EIRP 46.01 dBm for QPSK 46.99 dBm for 16QAM	Conducted Power 29.01 dBm for QPSK 29.99 dBm for 16QAM
EVM	≤8%	64QAM
RS Power	±2.1dB	
ACLR	≤-45dBc	
Spurious Emission	Category A	

Table 6: RF Specifications for DL Transmissions

2.6.2 Uplink Reception (for 20MHz BW)

Item	Specification	Remarks
Frequency Range	Band48	10 / 20MHz BW
Sensitivity	≤-96.5dBm	
Others	3GPP Standard	

Table 7: RF Specifications for UL Receptions

2.7 RF Block Description

JLT733A is based on LTE TDD technology consisting of downlink and uplink transmitted through different frequencies. Explanation for each path is described below:

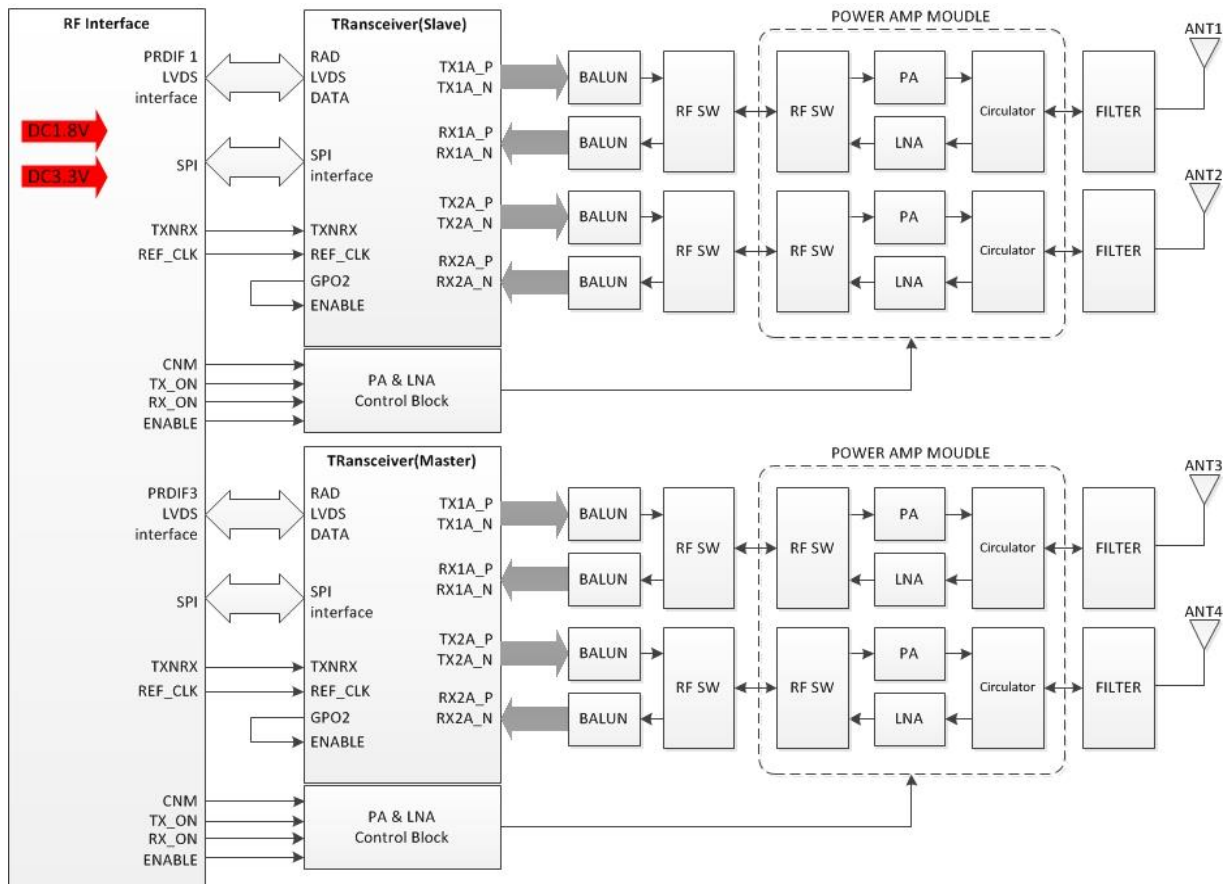


Figure 4: RF Block Diagram

A. Downlink (Tx)

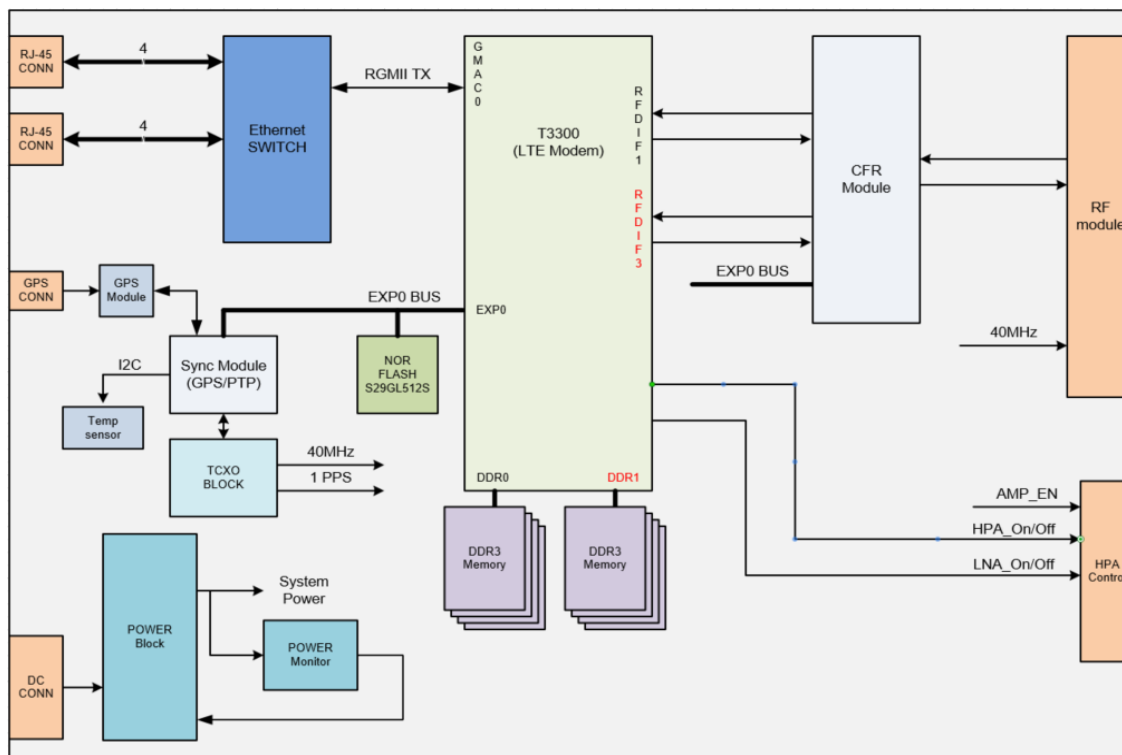
RF signal from transceiver enters Power AMP module through BALUN and a Filter. In Power AMP module, the signal is generated as the maximum level and this signal is transmitted via ANT after passing Filter (out of band's noise removal)

B. Uplink (Rx)

The RF signal from ANT enters filter (out of band's noise removal) and then enters Power AMP module. This signal is amplified via LNA and then enters Transceiver via a Filter and BALUN.

2.8 Digital block Description

JLT733A is equipped with 4Giga Byte DDR3 SDRAM and CPU(Intel/T3300) operating at 1000MHz



A. Modem Chip

Intel's T3300 Wireless Base Station System on Chip ("Transcede "T3300") delivers the required performance for next generation wireless networks such as Long Term Evolution (LTE), in a single System on Chip (SoC).

This SoC combines the latest Reduced Instruction Set Computer (RISC) processor technology with a high-performance Digital Signal Processing (DSP) array supporting a simplified programming model. The device offers hardware acceleration for application specific tasks, and a rich set of interfaces and features, which allow the Transcede 3300 to provide a completely integrated solution covering the needed processing capability from Internet Protocol (IP) (for example, S1) packets to IQ samples at extremely low power.

B. IEEE 1588v2

IEEE 1588v2 is a standard for precision time synchronization in local area networks. It works using exchange of special Precision Time Protocol (PTP) frames.

C. Ethernet

JLT733A has two external ports: WAN, MGMT ports.

D. RF

This block communicates with the RF transceiver (AD9363) and the baseband chip (T3300) is controlled by RF-SPI, and I/Q data is controlled by LVDS interface.

E. Power

The voltage range of power supplied by external source is 9V. It goes into power IC (DC/DC step down converter and LDO etc.)

2.9 Software block Description

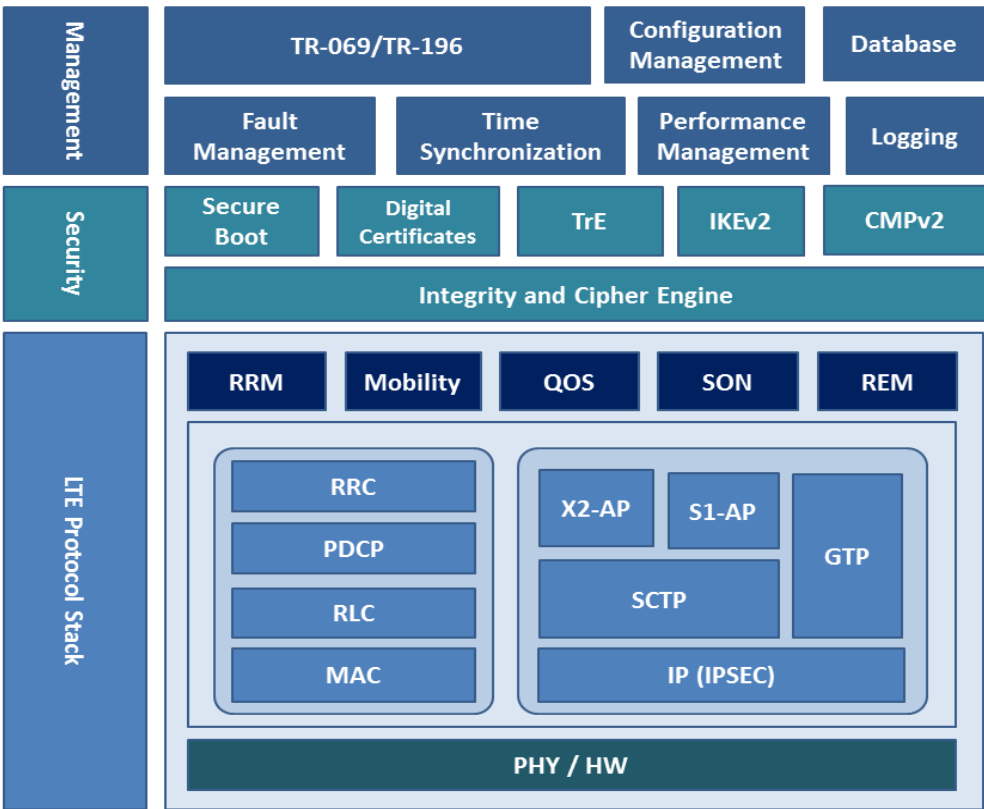


Figure 5: Software Block Diagram

2.9.1 LTE protocol Stack

The LTE Protocol Stack is composed of LTE protocols defined in 3GPP Release 10.

- PDCP (Packet Data Convergence Protocol)
Delivery and handling of user / control data including header compression and ciphering (defined in TS 36.323)
- RLC (Radio Link Control)
Data delivery between MAC and PDCP including segmentation and ARQ (defined in TS 36.322)
- MAC (Media Access Control)
Protocol mapping between transport channels and logical channels (defined in TS 36.321)
- RRC (Radio Resource Control)
Protocol to handle control plane signaling (defined in TS 36.331)
- S1AP (S1 Application Protocol)
Signaling protocol between HeNB and EPC (defined in TS 36.413)
- X2AP (X2 Application Protocol)
Signaling protocol between HeNBs to handle UE mobility (defined in TS 36.423)
- GTP (GPRS Tunneling Protocol)
Tunneling protocol for user plane (defined in TS 29.281)
- SCTP (Stream Control Transmission Protocol)
Transport protocol for S1 and X2 control interfaces (defined in TS 36.412)

The LTE Protocol Stack also includes blocks to support following higher layer functions.

- RRM (Radio Resource Management)
Management and control of radio resources including admission control and packet scheduling
- Mobility
Handling of mobility between cells with same or different frequencies through S1 and X2 links
- QoS (Quality of Service)
Provides QoS functions according to bearer types and associated parameters
- SON (Self Organizing Network)
Provides automatic configuration and parameter optimizations
- REM (Radio Environment Monitoring)
Measurement to identify surrounding cells for SON and ANR

2.9.2 Security

Security Layer covers security functions to interface with external entities and protect small cells from various security threats using built-in cryptographic functions.

- Secure Boot
Performs device integrity checks upon booting to verify all HeNB components
- Digital Certificates
Handles X.509 Certificates for HeNB security procedures
- IKEv2 (Internet Key Exchange Version 2)
Protocol between HeNB and Security Gateway to establish SAs (security associations)
- TrE (Trusted Environment)
Trustworthy environment for the execution of sensitive functions and the storage of sensitive data
- CMPv2 (Certificate Management Protocol Version 2)
Protocol for obtaining X.509 certificates through a PKI (Public Key Infrastructure)

2.9.3 Management

Management Layer provides management capabilities for HeNB and interfaces with upper layer managing entities.

- TR-069
HTTP / SOAP based Management protocol between HeNB and HeMS
- TR-196
Data model for provisioning of HeNB services
- Fault Management
Provides standard interfaces to manage HeNB faults and alarms
- Performance Management
Provides standard interfaces to manage HeNB performance data
- Configuration Management
Provides standard interface for HeNB configuration and provisioning
- Time Synchronization
Provides time synchronizing protocols (IEEE1588, NTP)
- Logging
Provides logging capabilities through built in volatile and non-volatile storages.
- Database
Maintains an internal database to manage configurations, statistics and status

3 Interface and LED Description

3.1 Interface and Connector

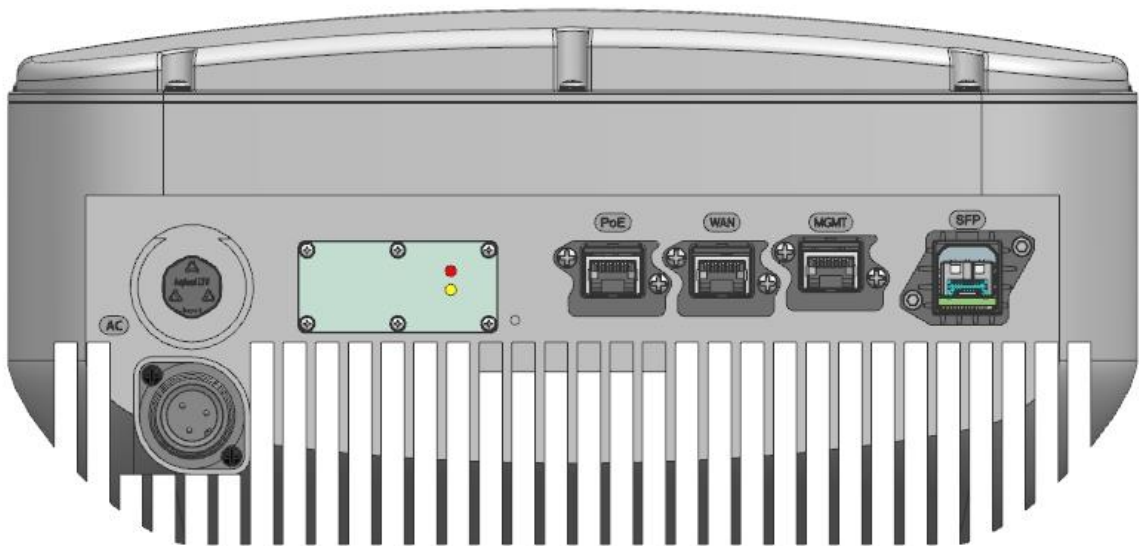


Figure 6: Interface & Connector

Interface	Type	Default value	Description
WAN	RJ-45	10.1.35.210	WAN connection
MGMT	RJ-45	10.0.0.1	Direct connection for management
CMOS UART	-	-	Debugging port (3.3V)
AC	-	-	AC power 100~240Vac
SFP			Optic
PoE			Power supply to provide power to the external PoE
Protective Vent	Vent M12		device Protective Vent

Table 8: Interface & Connector Description

3.2 LED

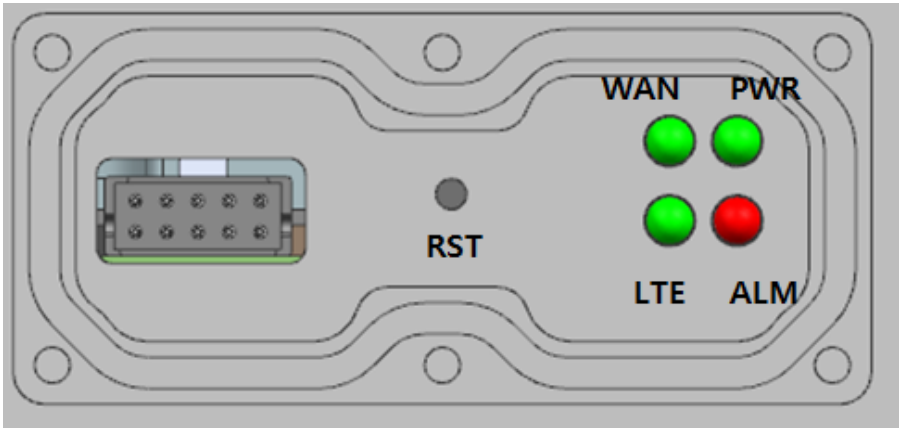


Figure 7: LED Description

LED	Intermittent Blink Green	Blink Green	Solid Green	Solid Red	Off
LTE	On Carrying Traffic	On, Booting/Rebooting	LTE On	-	LTE Off -
ALM	-	-		Alarm	No Alarm
WAN	Link	-	-	-	Not connected
PWR	-	-	Connected	-	Not connected

Table 9: LED Description

4 Initial Connection

4.1 Cable Connection

Connect a UTP cable from Control PC to local MGMT Port in Small Cell and set the static IP address in the PC to 10.0.0.100 as shown in Figure 8 or if you have a router you can configure network as described in Figure 9 and connect the UTP cable from WAN port to the router. You can have access to Small Cell through router from Control PC as well using the WAN IP if the router is configured accordingly.



Figure 8: Small Cell Direct Connection for Management

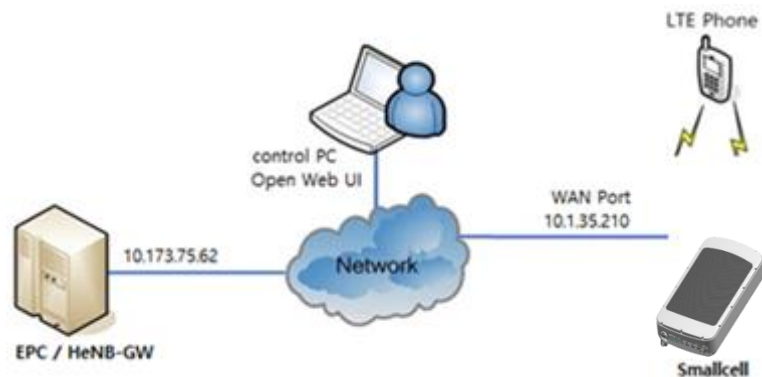


Figure 9: Small Cell Connection for Management via Network

4.2 Connection Test

First turn on the power of Small Cell and wait for the boot-up and if you make a direct connection from local MGMT Port check the connectivity of Small Cell with Control PC by examining Ping response from management IP address of local MGMT Port (IP Address: 10.0.0.1) as shown in Figure 10.

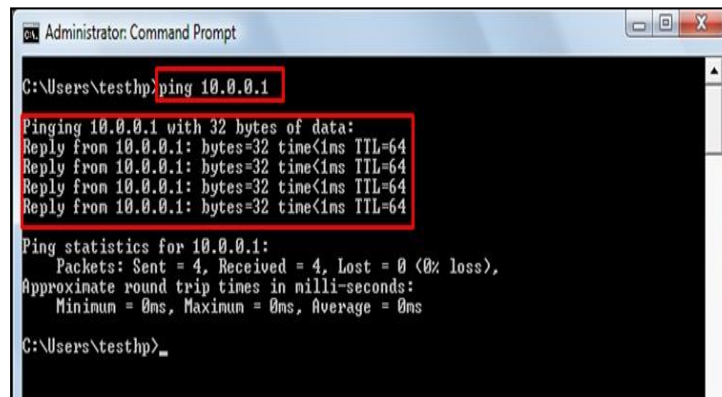


Figure 10: Ping Test from Control PC to Small Cell via local MGMT Port

5 Connection via Web GUI

If the Ping test to the management IP address 10.0.0.1 is successful, open a Web browser and type <http://10.0.0.1:8088> or <https://10.0.0.1> (IP address and port number of Small Cell for Web GUI) and press Enter key. As shown in Figure 11 and Figure 12, there will be a pop-up window and need to sign in with the following ID and password:

- ID: **admin**
- Password: **junismallcell**

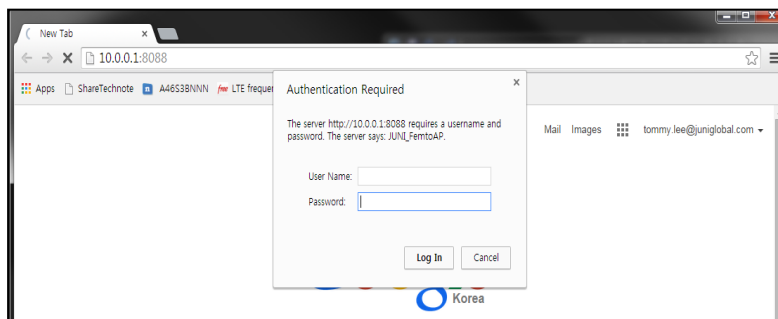


Figure 11: Web GUI of Small Cell

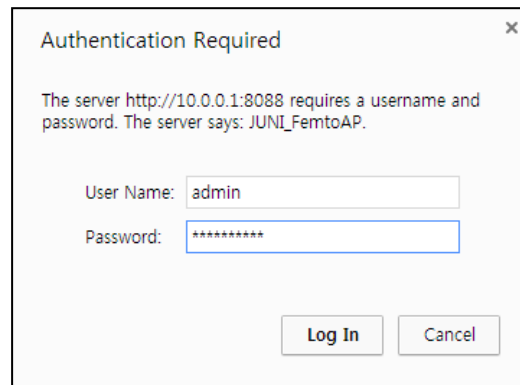


Figure 12: Pop-up Window for Sign-in

After signing in successfully, there will be a main page as shown in the Figure 13. The tree menu on the left side has sub-menus where the user can configure the settings and check information of the device. If you click the sub-menus, more information related to the categories will be displayed on the left side of the page.

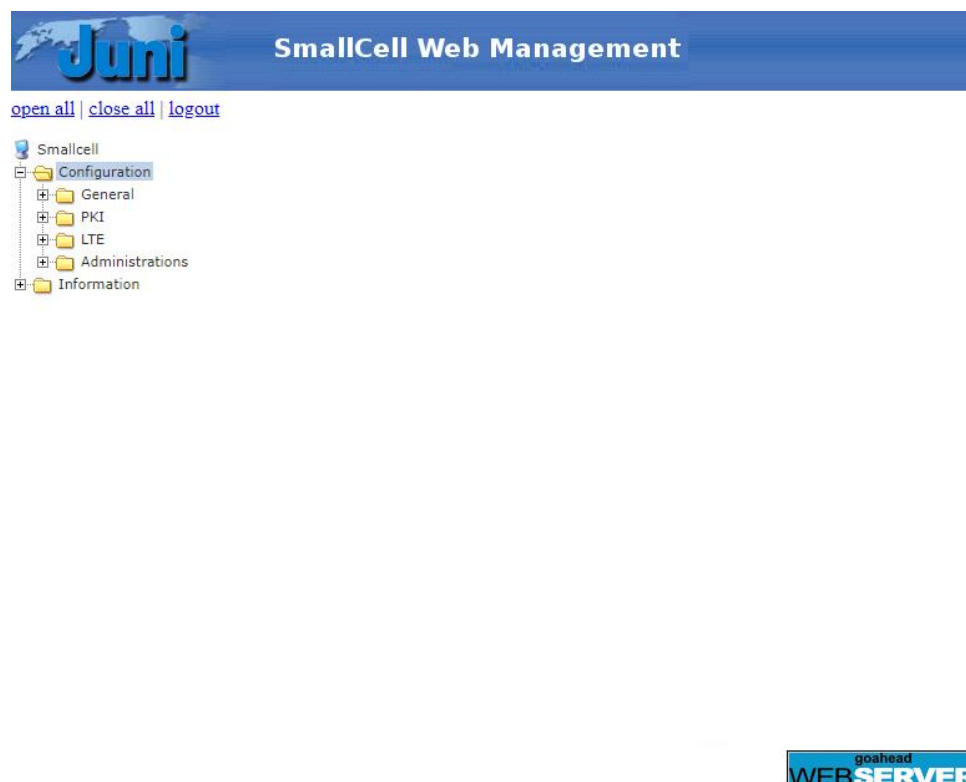


Figure 13: Main Page of Small Cell Web UI

6 Web GUI Operation

6.1 Web GUI Menu

Table 10 and Table 11 describe each menu where the user can configure and check the setting of Small Cell.

Menu Tree	Description
> Configuration	
>> General	
>>> Network Interface	Add, modify, and delete Network Interface. Configure IPv4/6, DHCP/Static IP and Vlan
>>> Network Function	Configure Vlan in each Interface
>>> Security Gateway	Enable or disable Security Gateway.
>>> DHCP Server	Enable or disable DHCP server in LAN port
>>> CWMP	Enable or disable CWMP for connecting HeMS and configure IP address of the HeMS as well.
>>> Clock sync & Sys time settings	Configure clock sync mode (GPS, IEEE 1588v2, Air sync) and NTP information. Also, Downlink Time Offset is configurable.
>>> WAN port	Configure Ethernet port information.
>>> Statistics Report	Configure the server information to which statistics data is uploaded.
>>> Optional Setting	Configure the Host name and IP address of the LAN port.
>>> Static Routing	Configure static routing information if necessary.
>>> SAS	Configure SAS if necessary.
>> PKI	
>>> eNodeB	Configure eNodeB private key and certificate information.
>>> CA Certificates	Import CA certificates.
>>> CMPv2	Configure CMP server information and select CMP request option.
>> LTE	
>>> Basic	Configure basic primary cell information including Cell ID, TAC, PCI, PLMN ID, EARFCN and TDD configurations etc.
>>> RF	Turn ON or OFF RF transmission and set the maximum transmit power for each antenna port.
>>> S1AP	Configure MME information.
>>> MR	Trigger quantity and threshold values can be configured.
>>> Neighbor Cell	Neighbor Cell configurations can be configured.
>>> UTRA Frequency	UTRA Frequency configurations can be configured.

>>> UTRA Neighbor Cell	UTRA Neighbor Cell configurations can be configured
>>> GERAN Frequency	GERAN Frequency configurations can be configured.
>>> GERAN Neighbor Cell	GERAN Neighbor Cell configurations can be configured.
>>> DSCP Mapping	Configure QCI to DSCP mapping.
>>> CSG	Configure access mode and CSG information.
>>> REM/SON	REM scan, SON (PCI Collision/Confusion, PCI Auto Allocation) can be configured.
>>> ESON	Configure ESON if necessary. PCI Auto Allocation, MRO and MLB can be configured.
>>> CA	Enable or Disable CA
>> Administrations	
>>> Settings	Manage system parameters for Small Cell by saving the amended system setting. Also, a new Configuration File can be imported for updating system setting or the current Configuration File can be exported. The system setting also can be rolled back to Factory default setting.
>>> Upgrade Firmware	Select a new firmware to be upgraded and apply it.
>>> Log Setting	Configure log levels and export volatile/non-volatile log files.
>>> Debug mask Setting	Configure debug masks used only for engineering purpose.
>>> Password Change	Configure a new password to access Web GUI.
>>> Remote Authentication	Configure Remote authentication settings
>>> Reboot	Reboot Small Cell. <i>If the amended setting was not saved before reboot, the values will be remained unchanged.</i>
> Information	
>> Update Period	Configure information update periods.
>> Device Info	Configure device information including MAC address, model name, serial number and SW/HW version etc.
>> CPU/Memory	Display memory and CPU load.
>> Process	Display processes information.
>> Status	Display SW process status and HW module status.
>> DHCP Info	Display DHCP client information.
>> IEEE1588 Info	Display IEEE1588 information and connection/locking status.
>> GPS Info	Display GPS locking status and information.
>> Resolved MME IP	Display current MME information.

>> RIP Info	Display current RIP information.
>> SAS Info	Display current SAS Information.
>> LTE Statistics	
>>> UE List	Display active UEs information.

Table 10: Description of Small Cell Web GUI Menu for CA Disabled

Menu Tree	Description
> Configuration	
>> General	
>>> Network Interface	Add, modify, and delete Network Interface. Configure IPv4/6, DHCP/Static IP and Vlan
>>> Network Function	Configure Vlan in each Interface
>>> Security Gateway	Enable or disable Security Gateway.
>>> DHCP Server	Enable or disable DHCP server in LAN port
>>> CWMP	Enable or disable CWMP for connecting HeMS and configure IP address of the HeMS as well.
>>> Clock sync & Sys time settings	Configure clock sync mode (GPS, IEEE 1588v2, Air sync) and NTP information. Also, Downlink Time Offset is configurable.
>>> WAN port	Configure Ethernet port information.
>>> Statistics Report	Configure the server information to which statistics data is uploaded.
>>> Optional Setting	Configure the Host name and IP address of the LAN port.
>>> Static Routing	Configure static routing information if necessary.
>>> SAS	Configure SAS if necessary.
>> PKI	
>>> eNodeB	Configure eNodeB private key and certificate information.
>>> CA Certificates	Import CA certificates.
>>> CMPv2	Configure CMP server information and select CMP request option.
>> LTE	
>>> CELL1	Primary Cell Configuration
>>>> Basic	Configure basic primary cell information including Cell ID, TAC, PCI, PLMN ID, EARFCN and TDD configurations etc.
>>>> RF	Turn ON or OFF RF transmission and set the maximum transmit power for each antenna port.
>>>> S1AP	Configure MME information.

>>>> MR	Trigger quantity and threshold values can be configured.
>>>> Neighbor Cell	Neighbor Cell configurations can be configured.
>>>> UTRA Frequency	UTRA Frequency configurations can be configured.
>>>> UTRA Neighbor Cell	UTRA Neighbor Cell configurations can be configured.
>>>> GERAN Frequency	GERAN Frequency configurations can be configured.
>>>> GERAN Neighbor Cell	GERAN Neighbor Cell configurations can be configured.
>>>> DSCP Mapping	Configure QCI to DSCP mapping.
>>>> CSG	Configure access mode and CSG information.
>>>> REM/SON	REM scan, SON (PCI Collision/Confusion, PCI Auto Allocation) can be configured.
>>> CELL2	Secondary Cell Configuration
>>>> Basic	Configure basic secondary cell information including Cell ID, PCI, Band Indicator, EARFCN and Channel Bandwidth configurations.
>>>> RF	Turn ON or OFF RF transmission and set the maximum transmit power for each antenna port.
>> Administrations	
>>> Settings	Manage system parameters for Small Cell by saving the amended system setting. Also, a new Configuration File can be imported for updating system setting or the current Configuration File can be exported. The system setting also can be rolled back to Factory default setting.
>>> Upgrade Firmware	Select a new firmware to be upgraded and apply it.
>>> Log Setting	Configure log levels and export volatile/non-volatile log files.
>>> Debug mask Setting	Configure debug masks used only for engineering purpose.
>>> Password Change	Configure a new password to access Web GUI.
>>> Remote Authentication	Configure Remote authentication settings
>>> Reboot	Reboot Small Cell. <i>If the amended setting was not saved before reboot, the values will be remained unchanged.</i>
> Information	
>> Update Period	Configure information update periods.
>> Device Info	Configure device information including MAC address, model name, serial number and SW/HW version etc.
>> CPU/Memory	Display memory and CPU load.
>> Process	Display processes information.

>> Status	Display SW process status and HW module status.
>> DHCP Info	Display DHCP client information.
>> IEEE1588 Info	Display IEEE1588 information and connection/locking status.
>> GPS Info	Display GPS locking status and information.
>> Resolved MME IP	Display current MME information.
>> RIP Info	Display current RIP information.
>> SAS Info	Display current SAS Information.
>> LTE Statistics	
>>> UE List	Display active UEs information.

Table 11: Description of Small Cell Web GUI Menu for CA Enable

6.2 Configuration Menu

6.2.1 General Menu

6.2.1.1 Network Interface

To configure the IP parameters in Small Cell, select Network Interface in the tree menu and it will display the Configuration page for Network setting.

[open all](#) | [close all](#) | [logout](#)

Smallcell

- Configuration
 - General
 - Network Interface**
 - Network Function
 - Security Gateway
 - DHCP Server
 - CWMP
 - Clock sync & SYS Time
 - WAN Port
 - Statistics Report
 - Optional Settings
 - Static Routing
 - SAS
 - PKI
 - LTE
 - Administrations
- Information

Network Interface

Registered Network Interfaces

- Registered virtual network interfaces (VIFs) are listed.
- To delete a VIF, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of VIF: 1

VIF 0	Modify	Delete			
Vlan ID	0	Vlan Priority	0	MTU	1500
IPv4	Enable ▼				
Connection type	DHCP ▼				
IPv6	Disable ▼				

Add a Network Interface

- You may add a new virtual network interface (VIF) upto 8 VIFs.
- To add, fill up the form below and press 'Add' button.

VIF Addition Form

Vlan ID	0	Vlan Priority	1	MTU	1500
IPv4	Disable ▼				
IPv6	Disable ▼				
Add Cancel					

DNS settings

DNS 1	168.126.63.1
DNS 2	0.0.0.0
DNS 3	0.0.0.0
Save Cancel	

Figure 14: DHCP Configuration for Network Connection

In Registered Network Interface, the user can configure Vlan ID, Vlan Priority, and size of MTU. The device supports IPv4/IPv6. A registered Network Interface can be modified and deleted in Registered Network Interfaces. Modified Network Interface's information will be applied after the unit reboot.

In Add a Network Interface page, the user can add a Network Interface. Click Add button and then new Network Interface will be added and shown in Registered Network Interface page.

There is a selection box to choose either DHCP or Static IP for Small Cell in connection type. Select DHCP and click on Modify, then the display shows as Figure 14. If no DHCP server is available, the IP address cannot be assigned to Small Cell.

On the other hand, if Static IP is selected, the user can configure the static IP address, Subnet Mask, Default GW manually. IP address configuration can be applied to the system after clicking Modify and rebooting device, as shown in the Figure 15 and Figure 16.

open all | close all | logout

Smallcell

Configuration

- General
- Network Interface
- Network Function
- Security Gateway
- DHCP Server
- CWMP
- Clock sync & SYS Time
- WAN Port
- Statistics Report
- Optional Settings
- Static Routing
- SAS
- PKI
- LTE
- Administrations
- Information

Network Interface

Registered Network Interfaces

- Registered virtual network interfaces (VIFs) are listed.
- To delete a VIF, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of VIF: 1

VIF 0	Modify	Delete
Vlan ID	0	Vlan Priority
		0
		MTU
		1500
IPv4	Enable	
Connection type	Static	
IP Address	10.1.45.161	
Subnet mask	255.255.255.0	
gateway	10.1.45.1	
IPv6	Disable	

Add a Network Interface

Figure 15: Network connection configuration page

10.1.45.163:8088/home.asp

SmallCell Web Management

open all | close all | logout

Smallcell

Configuration

- General
- PKI
- LTE
- Administrations
- Information

Figure 16: Static IP outcome after rebooting device

In Add a Network Interface, you can add a Network Interface. After configuring Vlan and network information, click Add button. Registered Network Interface's information was applied, as shown in the Figure 17 and Figure 18.

[open_all](#) | [close_all](#) | [logout](#)

Network Interface

Registered Network Interfaces

- Registered virtual network interfaces (VIFs) are listed.
- To delete a VIF, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of VIF: 1

VIF 0	Modify	Delete			
Vlan ID	0	Vlan Priority	0	MTU	1500
IPv4		Enable			
Connection type		Static			
IP Address		10.1.45.161			
Subnet mask		255.255.255.0			
gateway		10.1.45.1			
IPv6		Disable			

Add a Network Interface

- You may add a new virtual network interface (VIF) upto 8 VIFs.
- To add, fill up the form below and press 'Add' button.

VIF Addition Form

Vlan ID	22	Vlan Priority	1	MTU	1500
IPv4		Enable			
Connection type		Static			
IP Address		10.1.35.210			
Subnet mask		255.255.255.0			
gateway		10.1.35.1			
IPv6		Disable			

Add **Cancel**

Figure 17: Vlan Configuration

[open_all](#) | [close_all](#) | [logout](#)

Network Interface

Registered Network Interfaces

- Registered virtual network interfaces (VIFs) are listed.
- To delete a VIF, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of VIF: 2

VIF 0	Modify	Delete			
Vlan ID	0	Vlan Priority	0	MTU	1500
IPv4		Enable			
Connection type		Static			
IP Address		10.1.45.161			
Subnet mask		255.255.255.0			
gateway		10.1.45.1			
IPv6		Disable			

VIF 22 **Modify** **Delete**

Vlan ID	22	Vlan Priority	1	MTU	1500
IPv4		Enable			
Connection type		Static			
IP Address		10.1.35.210			
Subnet mask		255.255.255.0			
gateway		10.1.35.1			
IPv6		Disable			

Add a Network Interface

- You may add a new virtual network interface (VIF) upto 8 VIFs.
- To add, fill up the form below and press 'Add' button.

Figure 18: Registered Vlan Info

Also, other VLAN can be configured in the same way as mentioned above.

6.2.1.2 Network Function

In Network Function menu, can configure Vlan ID in each Interface. As shown Figure 18, Must have at least one registered Vlan ID in order to enable network function. Type correct Registered Virtual Network Interface (VIF) number you added in Network Interface Menu into each Interface in Network Function Setting page. Click Save button and OK button to apply your change.

[open all](#) | [close all](#) | [logout](#)

Network Functions Setting
You may configure Network functions setting.

VIF List	
Web	VIF 0
S1-U	VIF 0
S1-C	VIF 0
CWMP	VIF 0
IEEE-1588	VIF 0
IPSec	VIF 0
Default-Gateway	VIF 0

Figure 19: Network Function

6.2.1.3 Security Gateway

When Small Cell is connected to the environment where IPSec is enabled, Security-GW must be enabled and the user need to configure its IP address as shown in Figure 20

[open all](#) | [close all](#) | [logout](#)

Security Gateway Configuration
You may configure Security Gateway.

Security Gateway (SeGW)	
SeGW	Enable
SeGW IP or FQDN	10.1.35.211
IKE Port Number	500
IKE NAT-T Port Number	4500
Identity	(Blank to use subject DN of certificate)
Destination subnet	0.0.0.0/0 (Syntax: subnet/prefix[, subnet/prefix]... Use 0.0.0.0/0 to comply with SeGW's TSr)
Authentication Method	PSK
Passphrase for PSK	*****
Reauthentication	Disable
Rekey	Disable
Margin time	9m N[d]h[m]s (e.g. 10m for 10 minutes)
DPD interval	60 sec
Last assigned tunnel IP	0.0.0.0

Figure 20: Security-GW IP Address Configuration

6.2.1.4 DHCP Server

From the tree menu, select DHCP Server to move onto the DHCP server page for configuring enable/disable of DHCP. After changing DHCP Server and click Apply, the new configuration must be saved.

open all | close all | logout

Smallcell

- Configuration
 - General
 - Network Interface
 - Network Function
 - Security Gateway
 - DHCP Server**
 - CWMP
 - Clock sync & SYS Time
 - WAN Port
 - Statistics Report
 - Optional Settings
 - Static Routing
 - SAS
 - PKI
 - LTE
 - Administrations
 - Information

DHCP Server Setup

You may configure DHCPv4 server settings.

DHCPv4 Server

Enable/Disable DHCPv4 Server:

DHCPv4 Server Settings

Start IP Address:

End IP Address:

Lease Time:

WINS:

DNS Settings

DNS 1:

DNS 2:

DNS 3:

Apply Cancel

Figure 24: DHCP Server setup

6.2.1.5 CWMP

From the tree menu, select CWMP to move onto the CWMP Setup page for configuring enable/disable of CWMP and HeMS server IP address. After changing the HeMS server address and click Apply, the new configuration must be saved.

open all | close all | logout

Smallcell

- Configuration
 - General
 - Network Interface
 - Network Function
 - Security Gateway
 - DHCP Server
 - CWMP**
 - Clock sync & SYS Time
 - WAN Port
 - Statistics Report
 - Optional Settings
 - Static Routing
 - SAS
 - PKI
 - LTE
 - Administrations
 - Information

CWMP Setup

You may configure CWMP settings.

CWMP Mode

Enable/Disable CWMP:

CWMP Settings

SON mode:

Hems URL:
(http(s)://x.x.x.x:port)

Username:

Password:

Connection Retry Count:

Enable Periodic Inform: ☒

Periodic Inform Interval:

Connection request username:

Connection request password:

Save Cancel

Figure 21: CWMP Setup Menu

6.2.1.6 Clock sync & SYS time settings

From the tree menu, select Clock sync and Sys time settings to move onto System Time Settings configuring Disable, NTP, and GPS/IEEE1588. GPS Settings configuring Disable/Enable and GPS Holdover Time, IEEE1588 Settings configuring Disable/Enable, IEEE1588 Holdover Time, and the number of Master IP, Air Sync configuring Disable/Enable. Also, Downlink Time Offset can be configured. After changing Clock sync and Sys time settings and click Apply, the new configuration must be saved.

[open all](#) | [close all](#) | [logout](#)

System time, GPS, IEEE1588, and Air sync Settings

System time, GPS, IEEE1588, and Air sync Settings

WARNING: If any 'initial waiting period' is set to 'zero', the system will wait forever until the selected method gets synchronized.

System Time Settings

System time mode	GPS / IEEE1588 ▼
------------------	------------------

GPS Settings

Mode	Enable ▼
Initial Waiting Period	300 Second(s)
Holdover to RF off Timer	300 Second(s)
Relock to RF on Timer	300 Second(s)
Holdover to Reboot Timer	3600 Second(s)

IEEE1588 Settings

Mode	Enable ▼
Initial Waiting Period	1800 Second(s)
Sync. Interval	-5 (-7 ~ 7; default: -1)
Delay Request Interval	-5 (-7 ~ 7; default: -1)
No. of Master IP	1 ▼
Master IP address 1	0.0.0.0

Air Sync

Mode	Disable ▼
------	-----------

Downlink Time Offset Setting

WARNING: If you don't know what downlink time offset means, please do not modify the value down below. (default: 0)

Downlink Time Offset Setting

Offset	0 ns (-50000000 ~ 50000000; default: 0)
--------	--

Figure 22: Clock sync and System time settings



If any holdover time is set to 'zero', the system will wait forever until the selected method gets Synchronized.

6.2.1.7 WAN Port

From the tree menu, select WAN port to move onto Speed, Duplex mode, Auto Negotiation setting page as shown in Figure 23.

After changing Wan Ethernet port and click Apply, the new configuration must be saved.

open_all | close_all | logout

Smallcell

- Configuration
 - General
 - Network Interface
 - Network Function
 - Security Gateway
 - DHCP Server
 - CWMP
 - Clock sync & SYS Time
 - WAN Port
 - Statistics Report

WAN Ethernet Port Control

You may configure ethernet port settings for the WAN.

WAN Port Configuration	
Speed	1G bps ▼
Duplex Mode	Full Duplex ▼
Auto Negotiation	Enable ▼

Apply Cancel

Figure 23: WAN Port Setup Menu

6.2.1.8 Statistics Report

Statistic Report should be configured to transfer the statistic of Small Cell to statistic management server (e.g. HeMS server). From the tree menu, select Statistics Report to move onto the Mode, IP address, User ID, Password page as shown in Figure 24

After changing the Statistics Report and click Apply, the new configuration must be saved.

open_all | close_all | logout

Smallcell

- Configuration
 - General
 - Network Interface
 - Network Function
 - Security Gateway
 - DHCP Server
 - CWMP
 - Clock sync & SYS Time
 - WAN Port
 - Statistics Report
 - Optional Settings

Statistics Report Configuration

You may configure Statistics Report settings.

Ftp server configuration	
Mode	Enable ▼
IP address	0.0.0.0
User ID	juni
Password	*****

Apply Cancel

Figure 24: Statistics Report setup Menu

6.2.1.9 Optional Settings

From the tree menu, select Optional Settings to move onto the MGMT port configuring host name, IP address, and subnet mask. After changing Optional Settings and click Apply, the new configuration must be saved.

Optional Setting	
Host Name	Smallcell
Management IPv4 Address	10.0.0.1
Subnet Mask	255.255.255.0

Save Cancel

Figure 25: Optional Setting

6.2.1.10 Static Routing

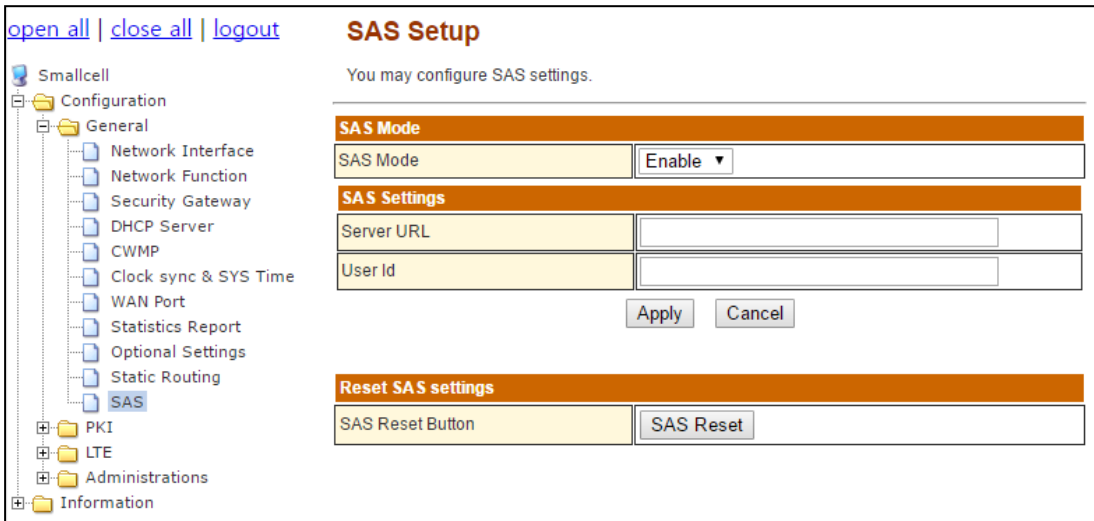
From the tree menu, the user can add/delete the “Static Routing” menu. To configure the static route information, the user must enter values for name, target, mask and gateway. Configuration must be saved to work properly.

Add static route		ADD	Cancel
IP Type	IPv4		
Name			
IP Address			
Mask(or prefixlen)			
Gateway			

Figure 26: Static Routing

6.2.1.11 SAS

User can be enable/disable the SAS. From the tree menu, select SAS to move onto the SAS Setup page. After changing the SAS setup and click Apply, the new configuration must be saved.



6.2.2 PKI Menu

PKI (Public Key Infrastructure) section controls eNodeB private key and certificate, CA certificate, and CMP request messages. The section contains three individual pages i.e., eNodeB, CA Certificate, and CMPv2.

6.2.2.1 eNodeB

eNodeB private key and certificate can be handled in 'eNodeB' page.

The first table, called 'eNodeB Private Key', controls eNodeB private keys. There are two options can be chosen one at a time. The first option, called 'Generate key internally', allows to generate eNodeB private key internally and this will be continued in CSR table. The second option, called 'Import key externally', allows to import an eNodeB private key paired with eNodeB certificate which will also be mentioned in eNodeB Certificate table. Generating or importing private key will delete current private key stored in the eNodeB if any exists. Also, passphrase may be required to import a private key.

The second table, called 'eNodeB Certificate', allows to import an eNodeB certificate which must be paired with the private key imported above. The box displays the information of current eNodeB certificate stored in the eNodeB. If any exists, current certificate will be deleted when new certificate is imported.

The third table in CSR section, called 'eNodeB CSR (Certificate Signing Request)', allows to generate CSR based on current private key and to export the generated CSR. User specific subject DN can be inserted or just AP specific CN value will be used as subject DN which is a format of model-serial Number as a default.

The fourth, last, table in PKI Status section, called 'Private key and Certificates Status', shows current status of PKI system i.e., pairness of private key and certificate, validity of certificate, and trust chain between certificate and CA certificate. The last one will be mentioned again in CA Certificates page later.

[open all](#) | [close all](#) | [logout](#)

Smallcell

Configuration

General

Network Interface

Network Function

Security Gateway

DHCP Server

CWMP

Clock sync & SYS Time

WAN Port

Statistics Report

Optional Settings

Static Routing

SAS

PKI

eNodeB

CA Certificates

CMPv2

LTE

Administrations

Information

eNodeB Private Key and Certificate

Management of private key and certificate for eNodeB

- You can import private key and certificate from external files.
- Alternatively, you can generate private key internally.

eNodeB Private Key

Select private key source

☐ Generate key internally
☒ Import key externally

Select private key file

Choose File No file chosen

Passphrase of private key file

(Blank for no passphrase)

Import

Cancel

eNodeB Certificate

No certificate for eNodeB

Select certificate file

Choose File No file chosen

Import

Cancel

CSR - Certificate signing request for eNodeB

- You can generate and export CSR for CA administrator to sign certificate. Generate private key first for CSR.
- Syntax of subject DN: 'RDN/RDN/..RDN' where RDN is 'attribute=value'.

eNodeB CSR (Certificate Signing Request)

Input subject DN and Generate CSR

/CN=JLT740-74TT010D5B00010

Generate CSR

Export

Cancel

PKI Status

Private key and Certificates Status	
Private key / certificate pair	FAILED
Certificate validity	FAILED
Certificate trust chain	FAILED

Figure 27: eNodeB Private Key and Certificate

6.2.2.2 CA Certificates

CA certificates can be handled in 'CA Certificates' page. This page allows to import and delete CA certificates and shows the information of selected CA certificate in a box. To pass the trust chain status (the last status in the table mentioned above), the current eNodeB certificate must be issued by current CA certificate which is stored in the eNodeB.



Figure 28: Trusted CA Certificates

6.2.2.3 CMPv2

CMP can be handled in 'CMPv2' page. In the first table, named 'CMP Server Information', all the CMP server configurations can be set up such as CMP server URL and port number. Also, Key Update Request margin time can be configured with unit of days, which decides automatically to send Key Update Request (KUR) to CMP server depending on KUR days.

In the second table, named 'CMPv2 Request', all the CMP actions can be handled manually. There are three request options can be chosen one at a time.

The first option, called 'IR-by Ref. value and IAK' (IAK based IR), sends Initial Request (IR) message with reference value and shared secret (IAK: Initial Authentication Key) for initial registration. Reference value and IAK should be provided by the vendor.

The second option, called 'IR-by the installed certificate' (certificate-based IR), sends IR with pre-installed eNodeB private key and certificate issued by the vendor. eNodeB private key and certificate should be provided by the vendor and pre-installed before sending the IR. Please reference section 6.2.2.1 eNodeB and 6.2.2.2 CA Certificate to install the proper private key and certificates.

The third, last, option, called 'KUR-for certificate renewal' (certificate renewal), sends Key Update Request message for prompt Key Update.

In the 'Result of CMPv2 Request' page, it shows the information and/or logs of actions done by the three options above.

[open all](#) | [close all](#) | [logout](#)

Smallcell

Configuration

General

PKI

eNodeB

CA Certificates

CMPv2

LTE

Administrations

Information

CMPv2 - Online Certificate Mangement Protocol

CMP Server Information

- Set CMP server's IP address, port number, and recipient DN
- 'Margin time for KUR' is how long before eNodeB's certificate expiry should attempts to renew certificate by CMP 'kur' procedure begin.

CMP Setting

CMP server URL (IP address or FQDN[<i>port</i>][<i>/path/to</i>])	10.1.35.100:4711
Margin time for automatic KUR (Certificate renewal ahead of expiry)	30 days (1~9999, 0:disable)
Recipient DN (For sending automatic CMP IR)	

ApplyCancel

CMPv2 Requests

- You can send CMP 'ir' message for Initial Registration/Certification.
- For IAK based IR, input the reference value and IAK (shared secret) registered to CA. For certificate based IR, eNodeB private key and certificate issued by vendor should be installed first.
- You can send CMP 'kur' message for prompt Key Update (certificate renewal).

CMP Request for Initial Registration/Certification or Key Update

Select CMP Request	☒ IR - by Ref. value and IAK ☐ IR - by the installed certificate ☐ KUR - for certificate renewal
Recipient DN	
Subject DN	
Reference value	183.117.157.0/27
IAK (Initial Autentication Key)	

SendCancel

Result of CMPv2 Request

Figure 29: CMPv2

6.2.3 LTE Menu

When CA is disabled, the LTE menu of one cell configuration is shown as shown in Figure 30 below.

When CA is enabled, two cell (CELL1 & CELL2) configurations are displayed as shown in Figure 31 below.

[open all](#) | [close all](#) | [logout](#)

- Smallcell
- Configuration
 - General
 - PKI
 - LTE
 - Basic
 - RF
 - SIAP
 - MR
 - LA
 - Neighbor Cell
 - UTRA Frequency
 - UTRA Neighbor Cell
 - GERAN Frequency
 - GERAN Neighbor Cell
 - DSCP Mapping
 - CSG
 - REM/SDN
 - ESON
 - CA
 - Administrations
 - Information

eNodeB Basic Configuration

You may configure LTE basic settings.

eNodeB Basic Configuration	
eNodeB Type	Home ▼
Cell ID	12345
TA Code	23456
PCI	101
Freq Band Indicator	42
eNodeB ID	SL00000001
eNodeB Name	UL740
DL EARFCN	43200
UL EARFCN	43200
Bandwidth	20
No. of PLMN ID	1 ▼
PLMN ID 1	00101
Cell reserved for operator use 1	Not Reserved ▼
Cell Barred	Not Barred ▼
Intra Freq Reselection	Allowed ▼
q-RxLevMin (-77 ~ -22)	-65 x2 dBm (SIB1)
Subframe Assignment	sa2 ▼
Special Subframe Patterns	ssp4 ▼

E-UTRA frequency	
No. of E-UTRA	2 ▼

EUTRA Frequency 1	
DL EARFCN	43200
UL EARFCN	43200
CELL Reselection Priority	7
Offset Frequency	0 dB ▼
HIO Restrict	Disable ▼

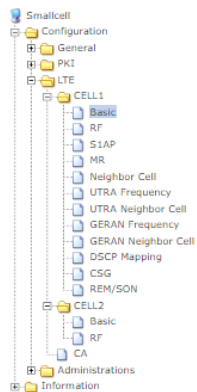
EUTRA Frequency 2	
DL EARFCN	43398
UL EARFCN	43398
CELL Reselection Priority	7
Offset Frequency	0 dB ▼
HIO Restrict	Disable ▼

Smallcell PCI	
Start	500
Range	0

ANR Configuration	
ANR X2 Trigger	Enable ▼

[Save](#) [Cancel](#)

Figure 30: eNodeB Basic Configuration MENU (CA Disable)

[open all](#) | [close all](#) | [logout](#)


<CA Enable – Cell 1>

eNodeB Basic Configuration

You may configure LTE basic settings.

eNodeB Basic Configuration	
eNodeB Type	Home ▼
Cell ID	12345
TA Code	23456
PCI	101
Freq Band Indicator	48
eNodeB ID	SL00000001
eNodeB Name	JL740
DL EARFCN	56340
UL EARFCN	56340
Bandwidth	20
No. of PLMN ID	1 ▼
PLMN ID 1	00101
Cell reserved for operator use 1	Not Reserved ▼
Cell Barred	Not Barred ▼
Intra Freq Reselection	Allowed ▼
q-RxLevMin (-77 ~ -22)	-65 x2 dBm (SIB1)
Subframe Assignment	sa2 ▼
Special Subframe Patterns	ssp4 ▼
E-UTRA frequency	
No. of E-UTRA	2 ▼
EUTRA Frequency 1	
DL EARFCN	56340
UL EARFCN	56340
CELL Reselection Priority	7
Offset Frequency	0 dB ▼
HO Restrict	Disable ▼
EUTRA Frequency 2	
DL EARFCN	56538
UL EARFCN	56538
CELL Reselection Priority	7
Offset Frequency	0 dB ▼
HO Restrict	Disable ▼
Smallcell PCI	
Start	500
Range	0
ANR Configuration	
ANR X2 Trigger	Enable ▼

<CA Enable – Cell 2>

eNodeB Basic Configuration

You may configure LTE basic settings.

Cell info	
CELL ID	22345
PCI	201
Freq Band Indicator	42
DL EARFCN	43398
UL EARFCN	43398
Bandwidth	20

Figure 31: eNodeB Basic Configuration MENU (CA Enable)

CA enable/disable can be set in the CA menu as shown Figure 32 below.

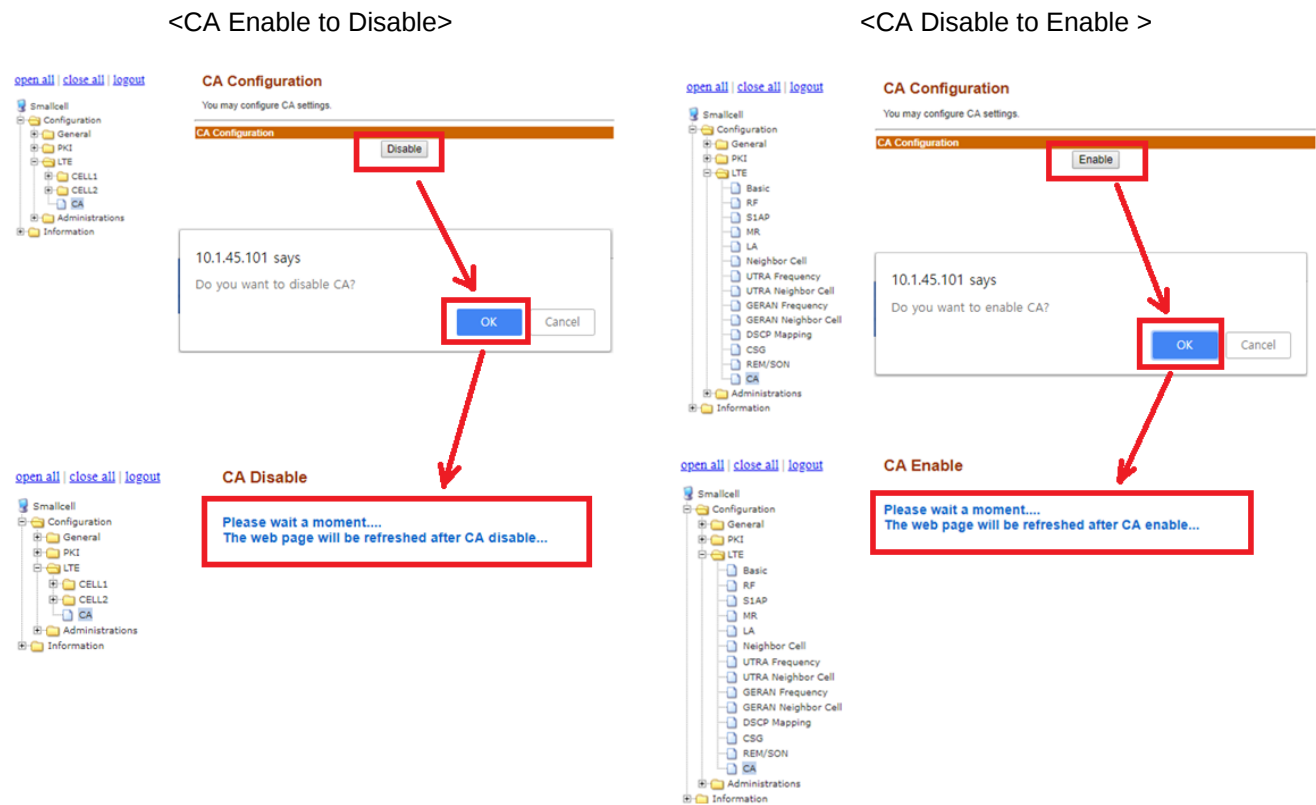


Figure 32: CA Enable/Disable MENU

6.2.3.1 Basic

From the tree menu, select Basic to move onto the eNodeB basic system parameters setting page as shown in Figure 30. eNodeB basic system parameters including TDD configuration (Subframe Assignment and Special Subframe Pattern) can be amended by clicking Apply button.



When the Basic configuraiton settings has been changed, it must be save button click and reboot to apply the changes.

Main Parameter	Description
eNodeB Basic Configuration	
eNodeB Type	eNodeB type for the serving cell (Macro or Home).
Cell ID	E-UTRAN Cell Identifier (ECI). Value should be put in decimal form.
TA Code	Tracking area code. Value should be put in decimal form.
PCI	Physical Cell Identifier for the serving cell.
Freq Band Indicator	E-UTRA operating band (broadcast in SIB1).
DL/UL EARFCN	DL/UL serving EARFCN.
Bandwidth	System bandwidth in MHz.
PLMN ID	PLMN ID (MCC+MNC).
Subframe Assignment	Defines the DL/UL subframe configuration for TD-LTE.
Special Subframe Patterns	Defines the configuration of the special subframe for TD-LTE.
E-UTRA frequency	
DL/UL EARFCN	DL/UL EARFCN list. EARFCN set must include the serving DL/UL EUTRA.
CELL Reselection Priority	Cell reselection priority for specific EUTRA frequency.
Offset Frequency	OffSetFreq value for specific EUTRA frequency.
HO Restrict	Restrict HO for the EUTRA frequency which is configured to HO Restrict = "Enable".
Small Cell PCI	
Start	The lowest PCI value in the PCI range allowed to trigger peer IP address acquisition procedure for X2 HO when "ANR X2 Trigger = Enable".
Range	Number of PCIs in the PCI range allowed to trigger peer IP address acquisition procedure including "start". When set to zero, small cell PCI range is not configured.
ANR Configuration	
ANR X2 Trigger	Enable/Disable triggering X2 setup for the neighbor EUTRA cells acquired via ANR procedure.

Table 12: Basic Configuration Parameter Information

6.2.3.2 RF

From the tree menu, select RF to move onto the RF Configuration page to turn the RF module on or off.

The green UN-BLOCK status (as shown in the Figure 33) indicates the RF is turned on and can be switched off by clicking the BLOCK button. (RF will be switched ON only if the Small Cell has the S1 connection with MME.)

The red BLOCK status (as shown in Figure 34) indicates the RF is turned off but can be switched on by clicking UN-BLOCK button. (RF can be switched OFF even though Small Cell has the S1 connection with MME.) If you want to change Tx Power, insert the number of value and apply button click. Then Tx power will be changed.

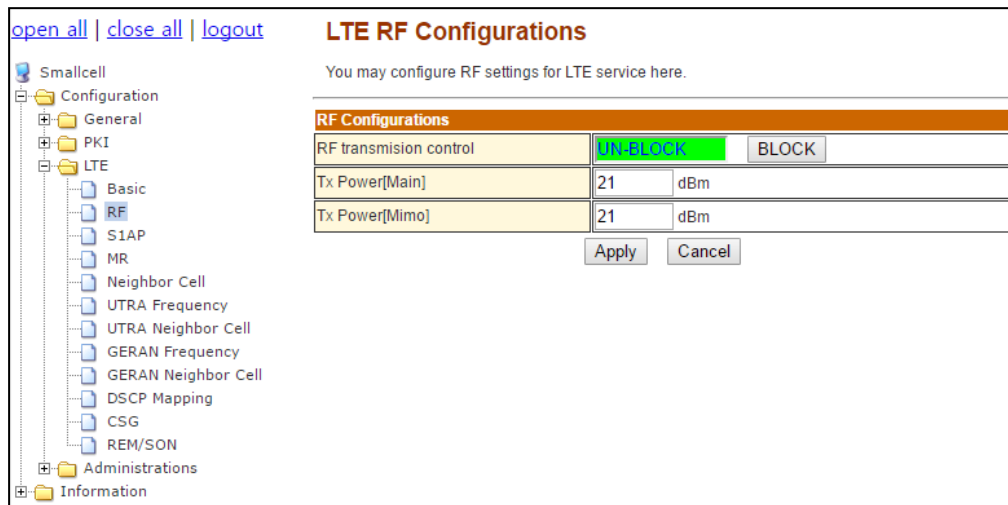


Figure 33: RF Un-block

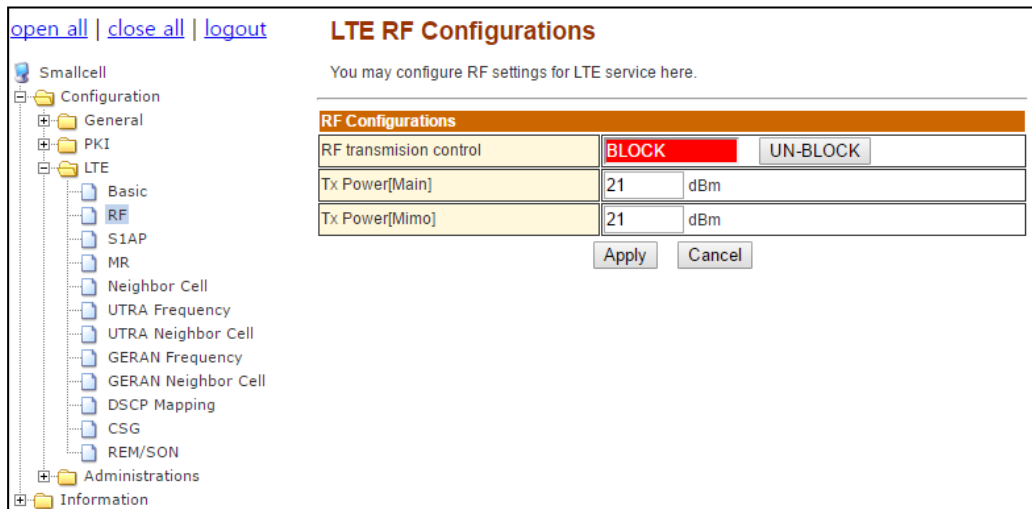


Figure 34: RF Block

6.2.3.3 S1AP

From the tree menu, select S1AP to move onto the S1AP setup page. Insert the number of MME and MME IP address and click the Save button.

[open all](#) | [close all](#) | [logout](#)

Smallcell

Configuration

General

PKI

LTE

Basic

RF

S1AP

MR

Neighbor Cell

UTRA Frequency

UTRA Neighbor Cell

GERAN Frequency

GERAN Neighbor Cell

DSCP Mapping

CSG

REM/SON

Administrations

Information

MME Setup

You may configure MME settings.

MME List	
No. of MME	1
MME IP Address 1 or FQDN	10.1.45.51
PLMN ID	

Save

Cancel

Figure 35: MME Setup