

# **ELT-622PI User Manual**

## **(CBRS)**

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**April 17, 2024**

## Revision History

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# 1 Introduction

## 1.1 Overview

ELT-622PI is enterprise 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 cellcan easily be installed like WiFi AP while Picocell is recommended to be installed after cell planning by wireless operators.

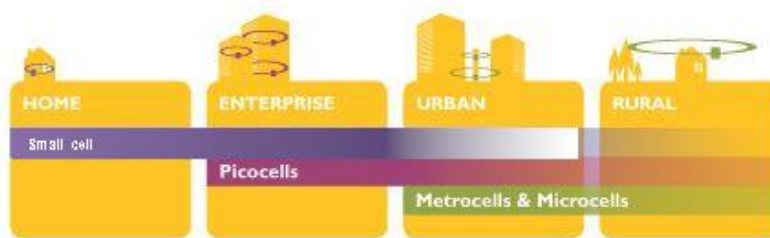


Figure 1: Types of Small Cell

## 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 WiFi 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.

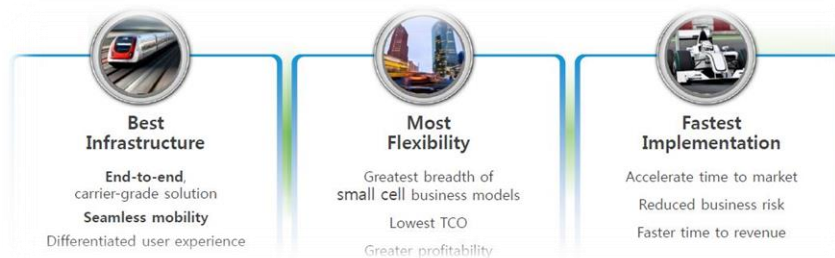


Figure 2: Benefits of Small Cell



## 1.4 Network Block Diagram

LTE Enterprise small cell AP, ELT-622PI, 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, ELT-622PI 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. ELT-622PI 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-located 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.

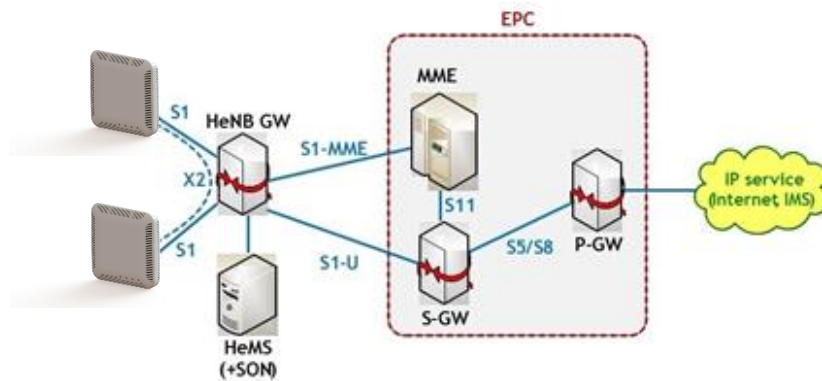


Figure 3: ELT-622PI and EPC Network Diagram

## 2 Characteristics

ELT-622PI has three external ports: WAN, Bridge and Management ports. For time/frequency synchronization IEEE 1588v2, GPS and Air sync are provided.

### 2.1 ELT-622PI System Main Functions

#### 2.1.1 3GPP Standards

ELT-622PI supports 3GPP Release 9 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 9 Standard Specifications**

### 2.1.2 ELT-622PI System Specifications

ELT-622PI system specifications are described in Table 2.

Item	System specifications	Remarks
Supporting standards	3GPP Release 9 specified in Table 1	
Interface	S1-U/S1-MME/X2-CP/X2-U	
Access type	Open/Closed	
Synchronization	IEEE 1588v2, GPS, Air Sync	
SON	REM, Automatic PCI/EARFCN/TAC allocation, ANR	Under development
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**

### 2.1.3 ELT-622PI Main Functions

Main functions provided by ELT-622PI 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, GPS, Air Sync

**Table 3: Main Functions**

## 2.2 Equipment Specifications

Item	Specification	Remarks
Active Users	32 Users	
Bandwidth	10/20 MHz	
WAN	RJ-45, 100/1000 BASE-T	
Bridge	RJ-45, 100/1000 BASE-T	
MGMT	RJ-45, 100/1000 BASE-T	Local Management
Integrated LTE Antenna	7 dBi	Max.
PoE (PD)	IEEE 802.3at-2009	TBD
Power Consumption	18Watts (12V/1.5A)	Max.

**Table 4: System Specifications**

## 2.3 Environmental Specifications

Item	Specification	Remarks
Operating Temp.	-5 – 40°C	23 – 104°F
Operating Humidity	5 – 80%	
Storage Temp.	-40 – 70°C	-40 – 158°F
Storage Humidity	10 – 95%	

**Table 5: Environmental Specifications**

## 2.4 AC/DC Adapter Specifications

Item	Specification	Remarks
Input Voltage Range	90 – 264Vac	
Rated Frequency	50 – 60Hz	
Input Current	1.5A	Max.
Input Leakage Current	3.5mA	
Output Voltage Range	11.4 – 12.6Vdc	
Output Current	3.5A	Max. load

## 2.5 RF Specifications

### 2.5.1 Downlink transmission (for 20MHz BW)

Item	Specification	Remarks
Frequency Range	Band48	10/20 MHz BW
Maximum Output Power	Total 25 dBm	+22dBm/Path
EVM	≤8%	64QAM
Frequency Error	±0.1 ppm	
Transmitter OFF Power	≤-85 dBm	
Total Power Dynamic Range	≥20.0 dB	20 MHz BW
Time Alignment Error	≤65 ns	
RS Power	±2.1 dB	
Occupied bandwidth	<18 MHz	20 MHz BW
ACLR	≤-45 dBc	
Spurious Emission	Category A	
Others	3GPP Standard	

**Table 6: RF Specifications for DL Transmissions**

### 2.5.2 Uplink Reception (for 20MHz BW)

Item	Specification	Remarks
Frequency Range	Band48	10/20 MHz BW
Reference Sensitivity	$\leq -96.5$ dBm	
Dynamic Range	$\leq -65.2$ dBm	16QAM
In-Channel Selectivity	$\leq -93.5$ dBm	QPSK
Adjacent Channel Selectivity	$\leq -90.5$ dBm	QPSK
Blocking	$\leq -90.5$ dBm	QPSK
Others	3GPP Standard	

**Table 7: RF Specifications for UL Receptions**

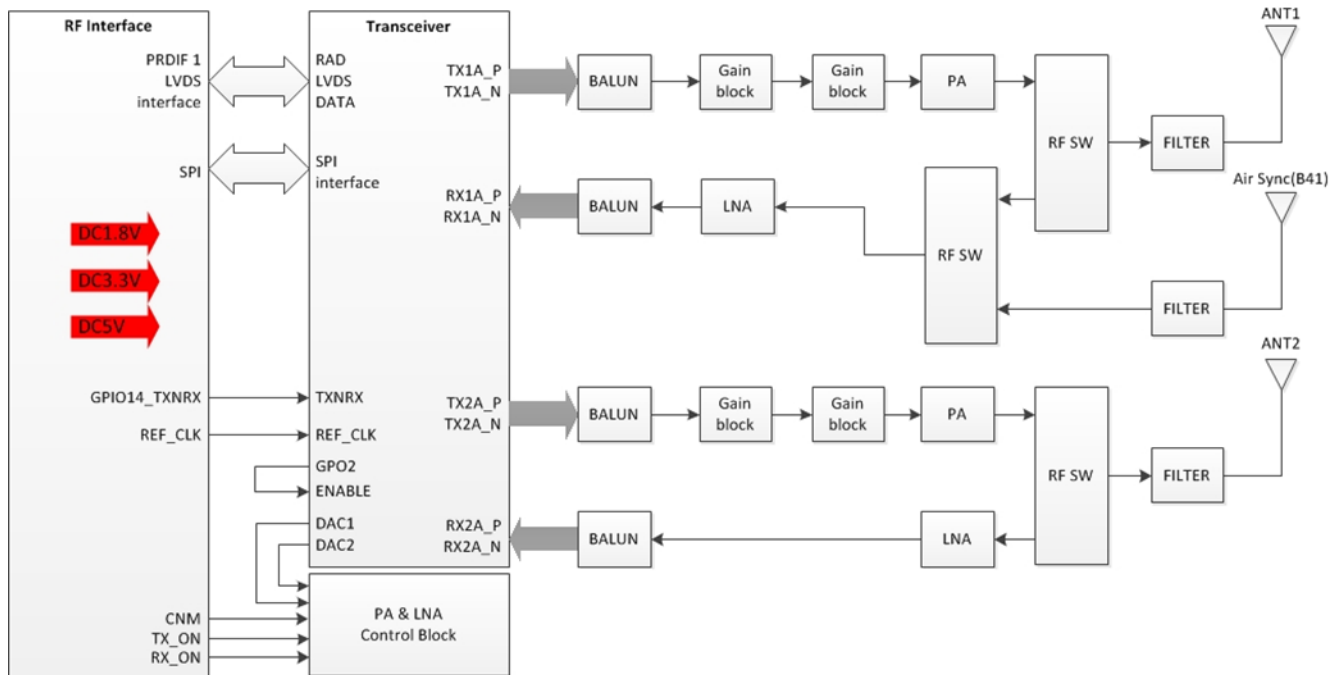
### 2.5.3 Mechincial Specifications

Item	Specification	Remarks
Dimension	200(W) x 205(H) x 51(D)mm Without bracket	7.9(W) x 8.1(H) x 2.0(D)in Without bracket
Volume	2.09Liter	
Weight	<900 Gram With antenna, Without adapter and bracket	< 2.0 lb With antenna, Without adapter and bracket
Material	PC+ABS	
IP Grade	IP30	
Cooling	Nature Convection	

**Table 8: Mechanical Specifications**

## 2.6 RF Block Description

ELT-622PI is based on LTE TDD technology consisting of downlink and uplink transmitted through the same frequency. Explanation for each path is described below:



**Figure 4: RF Block Diagram**

- A. Downlink(Tx)  
RF signal from transceiver generates the maximum output when passing BALUN, Gain Block and PA. This maximized output is transmitted via Antenna after out of band's noise is removed via Filter and then RF Switch.
- B. Uplink (Rx)  
The RF signal from Antenna passes through RF Switch after out of band's noise is removed via Filter. Original signal is amplified via LNA and entered into transceiver.



## 2.7 Digital block Description

ELT-622PI is equipped with 2 Giga Byte DDR3 SDRAM and CPU(Intel/T2200) operating at 1000MHz.

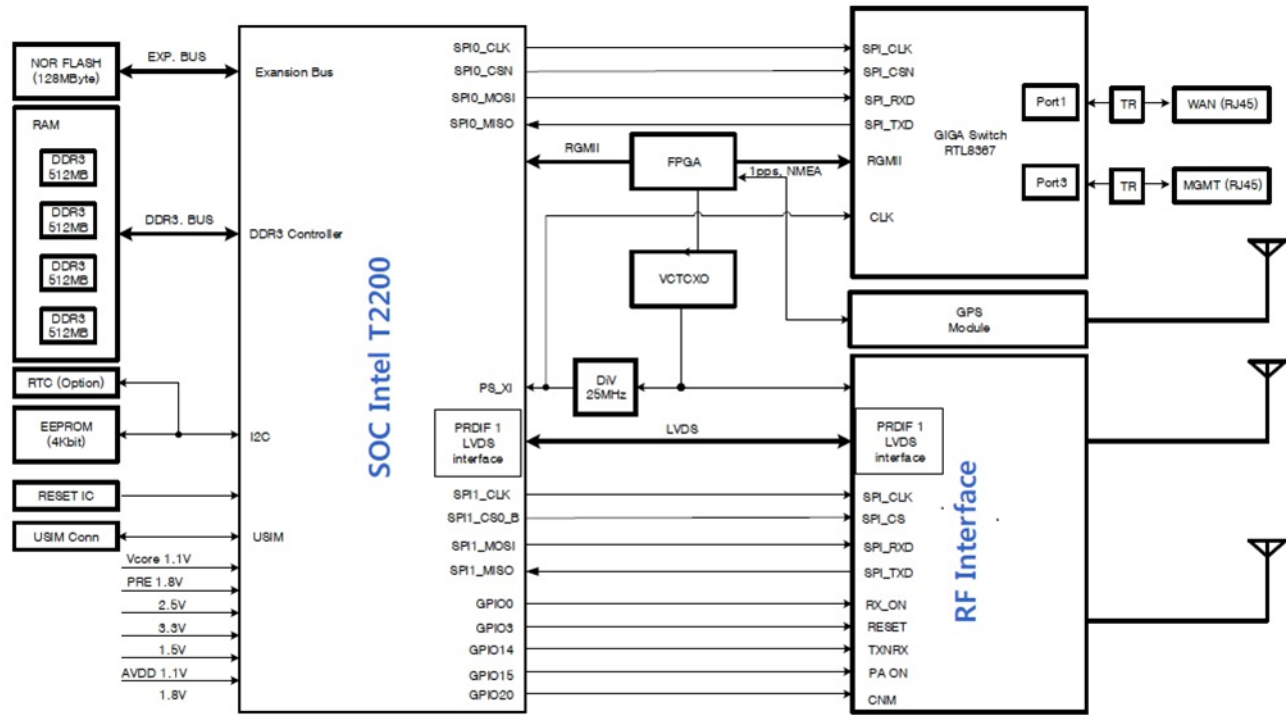


Figure 5: Digital Block Diagram

### A. Modem Chip

Intel's T2200 Wireless Base Station System on Chip ("Transcede 2200" or "T2200") 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 2200 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. GPS

Provides timing synchronization using 1 pps signal received from GPS satellites.

- D. Ethernet  
ELT-622PI has three external ports: WAN, Bridge and Management ports.
- E. RF  
This block communicates with the RF transceiver(AD9363) and the baseband chip(T2200) is controlled by RF-SPI, and I/Q data is controlled by LVDS interface.
- F. Power  
The voltage range of power supplied by external source is 12V.It goes into power IC (DC/DC step down converter and LDO etc.).

## 2.8 Software block Description

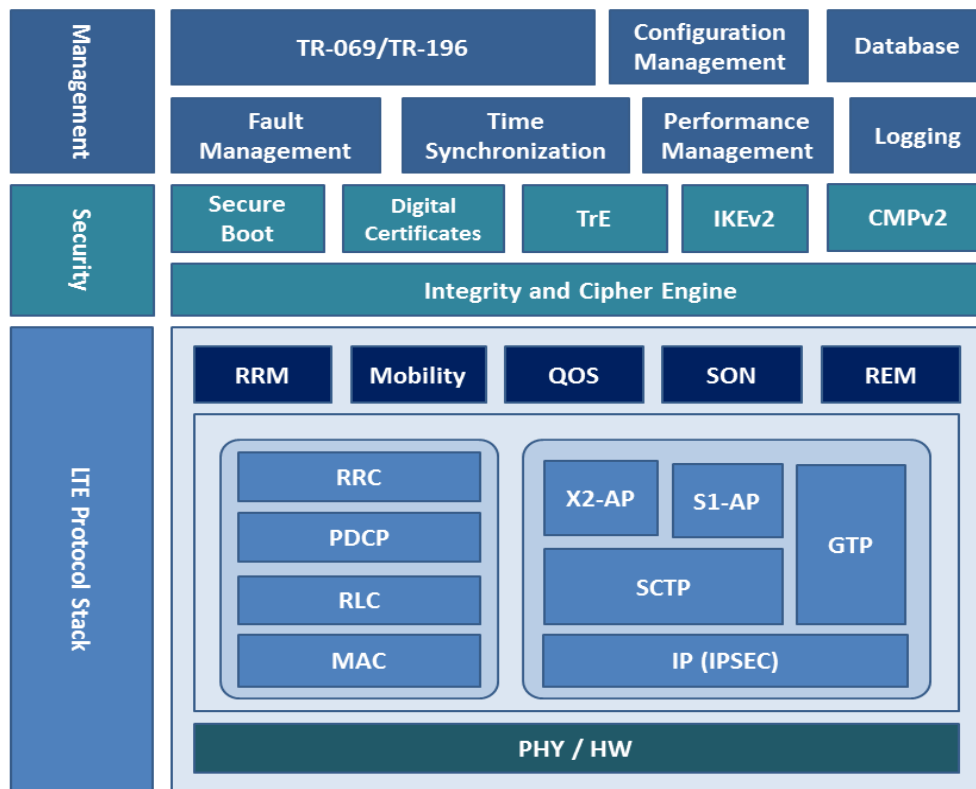


Figure 6: Software Block Diagram

## 2.8.1 LTE protocol Stack

The LTE Protocol Stack is composed of LTE protocols defined in 3GPP Release 9.

- 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

## 2.8.2 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)

### 2.8.3 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

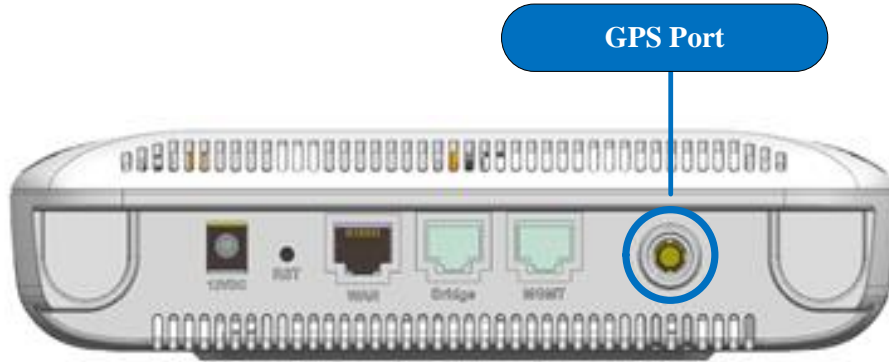


Figure 7: Interface & Connector

Interface	Type	Default value	Description
WAN	RJ-45	10.1.35.210	WAN connection
Bridge	RJ-45	N/A	
MGMT	RJ-45	10.0.0.1	Direct connection for management
Antenna Port	SMA(F)	N/A	LTE Antenna
GPS Port	SMA(F)	N/A	Feed DC 3V/100mA to External GPS Active Antenna
RST	Push switch	N/A	Push switch for reboot

Table 9: Interface & Connector Description

### 3.2 LED



**Figure 8: LED Description**

LED	Intermittent Blink Green	Blink Green	Solid Green	Solid Red	Off
LTE	On Carrying Traffic	On, Booting/Rebooting	LTE On	LTE Off	-
WAN	-	Not connected	Connected	-	-
Bridge	-	-	Connected	-	Not connected
PWR	-	-	Connected	-	Not connected

LTE, WAN, and BRIDGE LEDs except PWR LED are blinking during image download process.

**Table 10: LED Description**

### 3.3 RST (Reset switch)

- Pressing “Reset” switch shortly: Re-start
- Pressing “Reset” switch longer(for more than 4 seconds): Re-start at the factory reset  
Factory reset erases all device settings in order to return the device back to the condition when being shipped from the factory except “Private Key”, “Certificate”, “eNode(S1-C) network setting”, “S1-U network setting”, and “OAM network setting”.

## 4 Initial Connection

### 4.1 Cable Connection

Connect a UTP cable from Control PC to local MGMT Port in ELT-622PI and set the static IP address in the PC to 10.0.0.100 as shown in Figure 9 or if you have a router you can configure network as described in Figure 10 and connect the UTP cable from WAN port to the router. You can have access to ELT-622PI through router from Control PC as well using the WAN IP if the router is configured accordingly.



Figure 9: ELT-622PI DirectConnection for Management

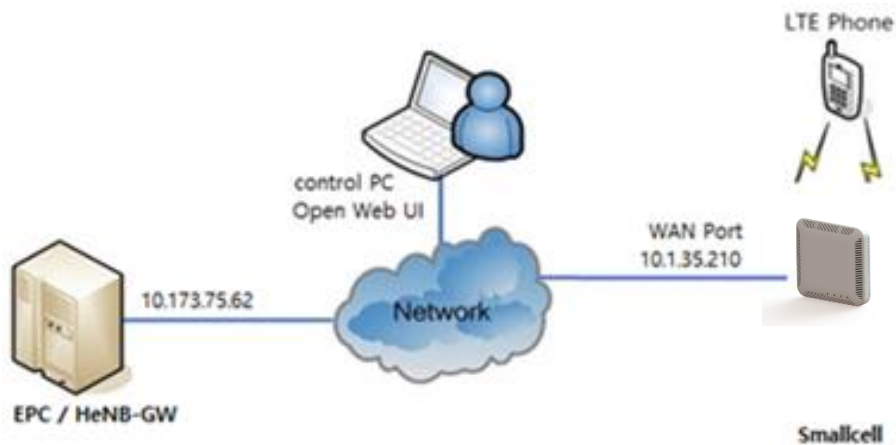
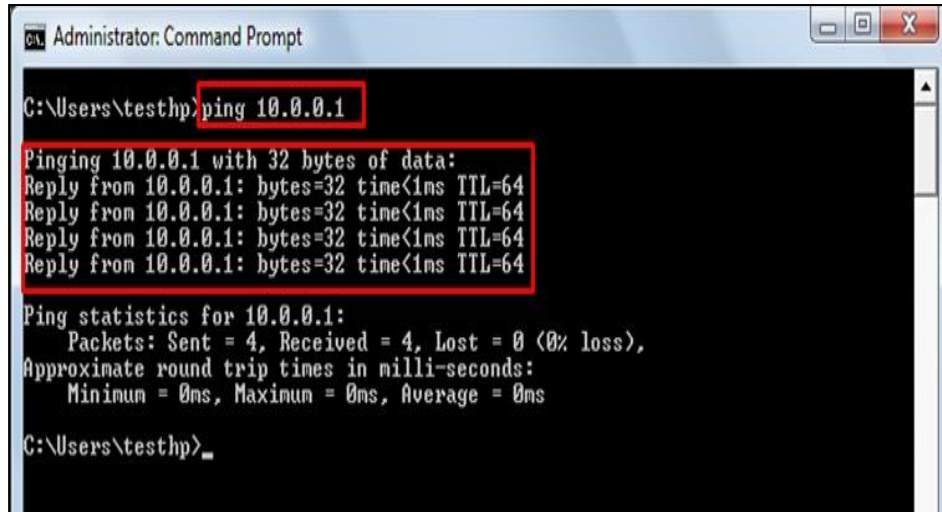


Figure 10: ELT-622PI Connection for Management via Network

## 4.2 Connection Test

First turn on the power of ELT-622PI and wait for the boot-up and if you make a direct connection from local MGMT Port check the connectivity of ELT-622PI 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 11.



```
Administrator: Command Prompt
C:\Users\testhp>ping 10.0.0.1
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time<1ms TTL=64
Reply from 10.0.0.1: bytes=32 time<1ms TTL=64
Reply from 10.0.0.1: bytes=32 time<1ms TTL=64
Reply from 10.0.0.1: bytes=32 time<1ms TTL=64

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\testhp>
```

Figure 11: Ping Test from Control PC to ELT-622PI 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 <https://10.0.0.1> or <http://10.0.0.1:8088> (IP address and port number of ELT-622PI for Web GUI) and press Enter key. As shown in Figure 12 and Figure 13, there will be a pop-up window and need to sign in with the following ID and password:

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

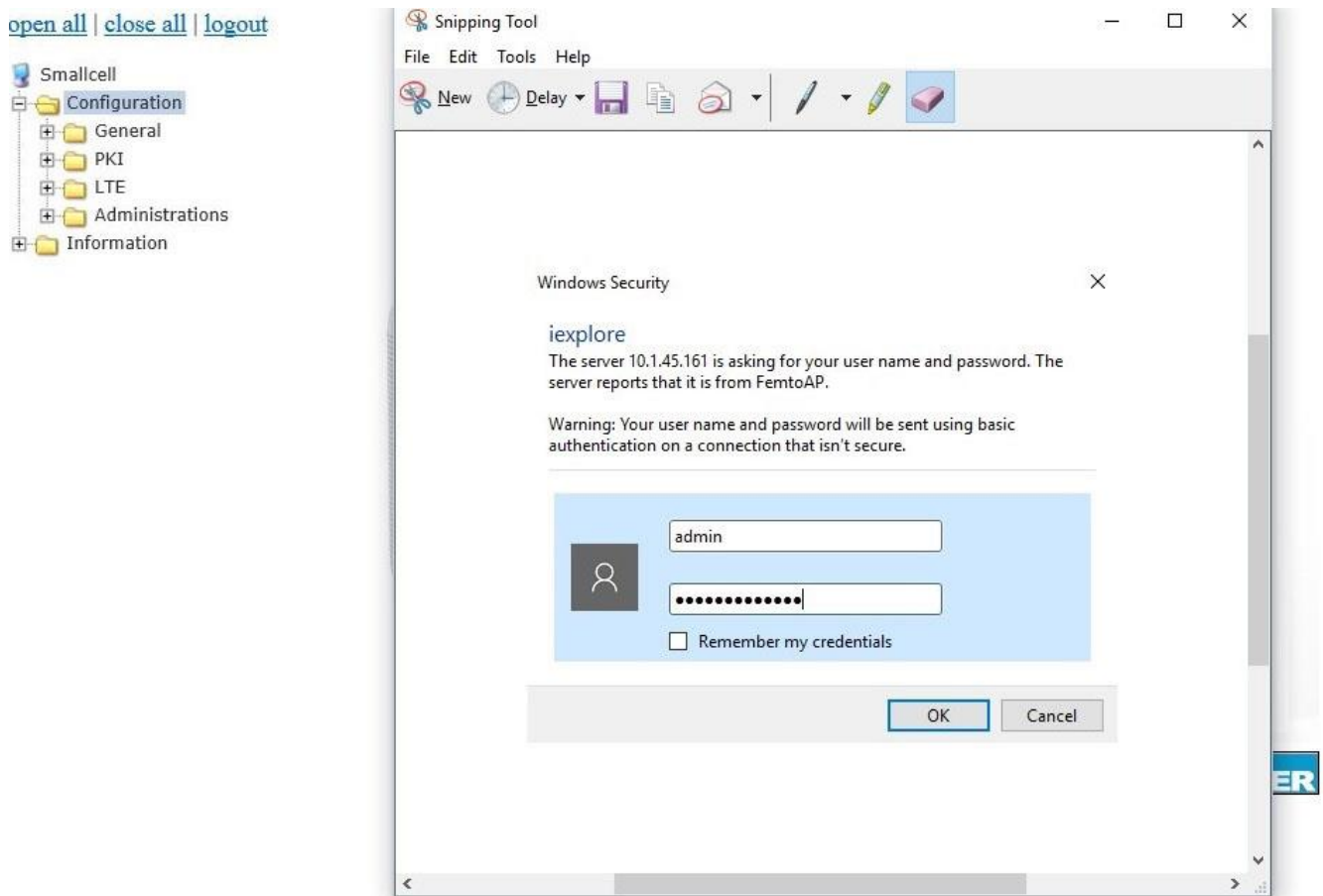


Figure 12: Web GUI of ELT-622PI

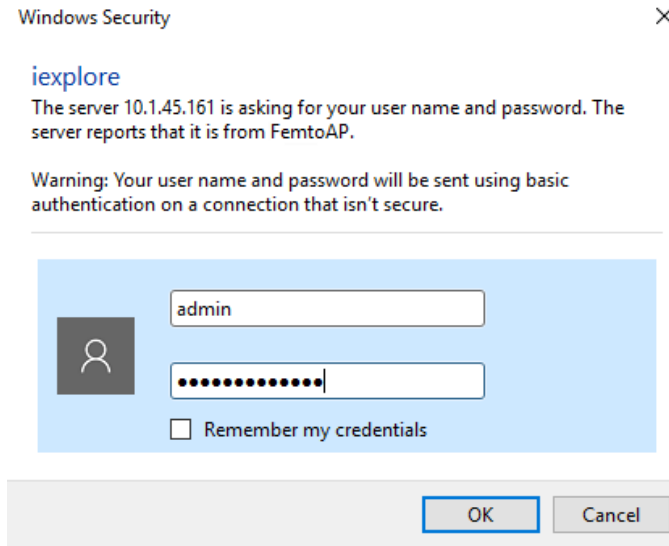


Figure 13: Pop-up Window for Sign-in

After signing in successfully, there will be a main page as shown in the Figure 14. 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 14: Main Page of ELT-622PI Web UI

## 6 Web GUI Operation

### 6.1 Web GUI Menu

Table 11 describes each menu where the user can configure and check the setting of ELT-622PI.

Menu Tree	Description
<b>&gt;Configuration</b>	
<b>&gt;&gt; General</b>	
<b>&gt;&gt;&gt;Network Interface</b>	Add, modify, and delete Network Interface. Configure IPv4/6, DHCP/Static IP and Vlan
<b>&gt;&gt;&gt;Network Function</b>	Configure Vlan in each Interface
<b>&gt;&gt;&gt;Security Gateway</b>	Enable or disable Security Gateway.
<b>&gt;&gt;&gt;DHCP Server</b>	Enable or disable DHCP server in LAN port
<b>&gt;&gt;&gt;CWMP</b>	Enable or disable CWMP for connecting HeMS and configure IP address of the HeMS as well.
<b>&gt;&gt;&gt;Clock sync &amp; Sys time settings</b>	Configure clock sync mode (GPS or IEEE 1588v2) and NTP information. Also, Air sync operation is configurable.
<b>&gt;&gt;&gt;WAN port</b>	Configure Ethernet port information.
<b>&gt;&gt;&gt;Statistics Report</b>	Configure the server information to which statistics data is uploaded.
<b>&gt;&gt;&gt;Optional Setting</b>	Configure the Host name and IP address of the LAN port.
<b>&gt;&gt;&gt; Static Routing</b>	Configure static routing information if necessary.
<b>&gt;&gt;&gt; SAS</b>	Configure SAS if necessary
<b>&gt;&gt; PKI</b>	
<b>&gt;&gt;&gt;eNodeB</b>	Configure eNodeB private key and certificate information.
<b>&gt;&gt;&gt; CA Certificates</b>	Import CA certificates.
<b>&gt;&gt;&gt; CMPv2</b>	Configure CMP server information and select CMP request option.
<b>&gt;&gt; LTE</b>	
<b>&gt;&gt;&gt;Basic</b>	Configure basic eNodeB information including Cell ID, TAC, PCI, PLMN ID, EARFCN and TDD configurations etc.
<b>&gt;&gt;&gt;RF</b>	Turn ON or OFF RF transmission and set the maximum transmit power for each antenna port.
<b>&gt;&gt;&gt;S1AP</b>	Configure MME information.
<b>&gt;&gt;&gt;MR</b>	Trigger quantity and threshold values can be configured.
<b>&gt;&gt;&gt; LA</b>	Configure Link Adaptation settings.
<b>&gt;&gt;&gt; Neighbor Cell</b>	Neighbor Cell configurations can be configured.
<b>&gt;&gt;&gt;UTRA Frequency</b>	UTRA Frequency configurations can be configured.
<b>&gt;&gt;&gt;UTRA Neighbor Cell</b>	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
>> Administrations	
>>> Settings	Manage system parameters for ELT-622PI 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.
>>> Analysis Log Report	Configure Analysis Log Report settings.
>>> Password Change	Configure a new password to access Web GUI.
>>>Remote Authentication	Configure Remote authentication settings
>>> Reboot	Reboot ELT-622PI. <b><i>If the amended setting was not saved before reboot, the values will be remained unchanged.</i></b>
> 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 ELT-622PI Web GUI Menu**

## 6.2 Configuration Menu

### 6.2.1 General Menu

#### 6.2.1.1 Network Interface

To configure the IP parameters in ELT-622PI, select Network Connection 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 10	Modify				Delete
Vlan ID	<input type="text" value="0"/>	Vlan Priority	<input type="text" value="0"/>	MTU	<input type="text" value="1500"/>
IPv4	Enable <input type="button" value="v"/>				
Connection type	DHCP <input type="button" value="v"/>				
IPv6	Disable <input type="button" value="v"/>				

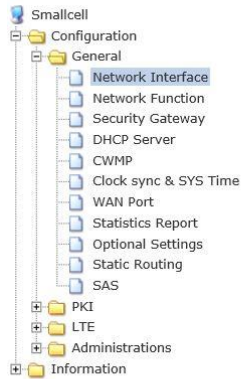
#### Add a Network Interface

- 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	<input type="text" value="0"/>	Vlan Priority	<input type="text" value="1"/>	MTU	<input type="text" value="1500"/>
IPv4	Enable <input type="button" value="v"/>				
Connection type	Static <input type="button" value="v"/>				
IP Address	<input type="text" value="10.1.35.210"/>				
Subnet mask	<input type="text" value="255.255.255.0"/>				
gateway	<input type="text" value="10.1.35.1"/>				
IPv6	Disable <input type="button" value="v"/>				
<input type="button" value="Add"/> <input type="button" value="Cancel"/>					

Figure 15: DHCP Configuration for Network Connection

[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 10	Modify	Delete			
Vlan ID	10	Vlan Priority	0	MTU	1500
IPv4	Enable				
Connection type	Static				
IP Address	10.1.35.81				
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.

VIF Addition Form					
Vlan ID	0	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 16: Network connection configuration page

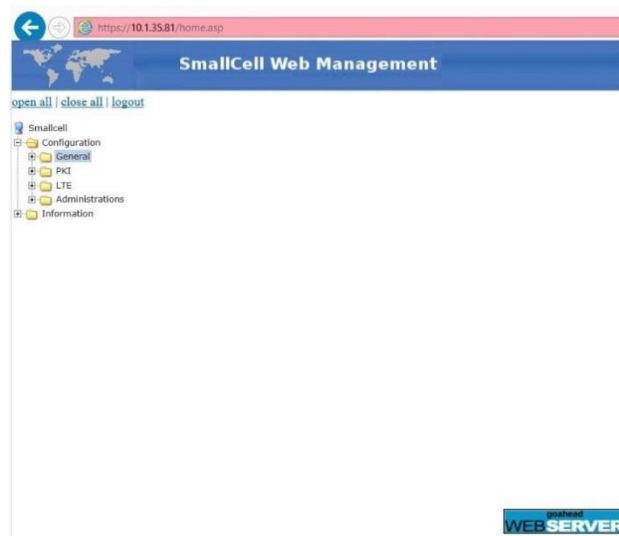


Figure 17: Static IP setting outcome

In Add a Network Interface page, you can add a Network Interface. Click Add button and then new Network Interface will be added and shown in Registered Network Interface page. In Registered Network Interface, it can configure Vlan ID, Vlan Priority, and size of MTU. The device supports IPv4/IPv6. Modified Network Interface's information will be applied after the unit reboot. A registered Network Interface can be modified and deleted in Registered Network Interfaces page.

There is a selection box to choose either DHCP or Static IP for ELT-622PI in connection type. Select DHCP and click on save, then the display shows as Figure 15. If no DHCP server is available, the IP address cannot be assigned to ELT-622PI.

On the other hand, if Static IP is selected, the user can configure the static IP address, Subnet Mask, Default GW and DNS address manually. IP address configuration can be applied to the system after clicking Add and rebooting device, as shown in the Figure 16 and Figure 17.

After configuring Vlan and network information, click Add button. Verify registered Network Interface's information was applied, as shown in the Figure 18 and Figure 19.

The screenshot shows the 'Network Interface' configuration page. On the left is a navigation tree with 'Network Interface' selected. The main content area has two sections:

- Registered Network Interfaces:** Shows a table with one entry:
 

VIF 10	Modify	Delete			
Vlan ID	0	Vlan Priority	0	MTU	1500
IPv4	Enable				
Connection type	DHCP				
IPv6	Disable				
- Add a Network Interface:** Shows a form for adding a new VIF:
 

VIF Addition Form					
Vlan ID	10	Vlan Priority	1	MTU	1500
IPv4	Enable				
Connection type	Static				
IP Address	10.1.35.88				
Subnet mask	255.255.255.0				
gateway	10.1.35.1				
IPv6	Disable				

Below the form is a confirmation dialog: "Do you want to add this VIF to list?" with 'OK' and 'Cancel' buttons.

Figure 18: Vlan Configuration

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

### 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	DHCP ▾				
IPv6	Disable ▾				
VIF 10		Modify			Delete
Vlan ID	10	Vlan Priority	1	MTU	1500
IPv4	Enable ▾				
Connection type	Static ▾				
IP Address	10.1.35.88				
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.

VIF Addition Form					
Vlan ID	10	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 19: Registered Vlan Info**

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

Any change of IP address causes connection to fail, because Web GUI attempts to connect to the WAN IP address automatically. Web GUI should be re-launched with original local LAN IP address.



### 6.2.1.2 Network Function

In Network Function menu, can configure Vlan ID in each Interface. As shown Figure 20. You 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](#)

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 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 ▾

Save Cancel

Message from webpage X

Do you want to save now?

OK Cancel

**Figure 20: Network Function**

### 6.2.1.3 Security Gateway

When ELT-622PI is connected to the environment where IPsec is enabled, Security-GW must be enabled and the user needs to configure its IP address as shown in Figure 21

[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

### Security Gateway Configuration

You may configure Security Gateway.

Security Gateway (SeGW)	
SeGW	Enable <input type="button" value="v"/>
SeGW IP or FQDN	<input type="text" value="10.1.35.211"/>
IKE Port Number	<input type="text" value="500"/>
IKE NAT-T Port Nubmer	<input type="text" value="4500"/>
Identity	<input type="text"/> <small>(Blank to use subject DN of certificate)</small>
Destination subnet	<input type="text" value="0.0.0.0/0"/> <small>(Syntax: subnet/prefix[, subnet/prefix]... Use 0.0.0.0/0 to comply with SeGW's TSr)</small>
Authentication Method	PSK <input type="button" value="v"/>
Passphrase for PSK	<input type="password" value="•••••"/>
Reauthentication	Disable <input type="button" value="v"/>
Reauth (or IKE Rekey) Period	<input type="text" value="7d"/> N[d h m s] (e.g. 3d for 3 days)
Rekey	Disable <input type="button" value="v"/>
Rekey Period	<input type="text" value="3d"/> N[d h m s] (e.g. 10h for 10 hours)
Margin time	<input type="text" value="9m"/> N[d h m s] (e.g. 10m for 10 minutes)
DPD interval	<input type="text" value="60"/> sec
Last assigned tunnel IP	<b>0.0.0.0</b>

**Figure 21: 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.

### 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

### DHCP Server Setup

You may configure DHCPV4 server settings.

DHCPv4 Server	
Enable/Disable DHCPV4 Server	Disable ▾
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

[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	Enable ▾
CWMP Settings	
SON mode	Disable ▾
Hems URL	http://10.1.55.111:10022 (http(s)://x.x.x.x:port)
Username	<input type="text"/>
Password	••••••
Connection Retry Count	5
Enable Periodic Inform	<input checked="" type="checkbox"/>
Periodic Inform Interval	300
Connection request username	<input type="text"/>
Connection request password	••••••
<input type="button" value="Save"/> <input type="button" value="Cancel"/>	

**Figure 22: DHCP setup & 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.



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

[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

## 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	Disable

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 23: Clock sync and System time settings**

### 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 24. 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
    - Optional Settings
    - Static Routing
    - SAS
  - PKI
  - LTE
  - Administrations
  - Information

### 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

Forward Portmap	
Port Mask	WAN CPU MGMT WIFI BRIDGE
WAN	11011
Bridge	10001
Mgmt	01110

Apply Cancel

**Figure 24: WAN Port Setup Menu**

### 6.2.1.8 Statistics Report

Statistic Report should be configured to transfer the statistic of ELT-622PI 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 25.

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
    - Static Routing
    - SAS
  - PKI
  - LTE
  - Administrations
  - Information

### Statistics Report Configuration

You may configure Statistics Report settings.

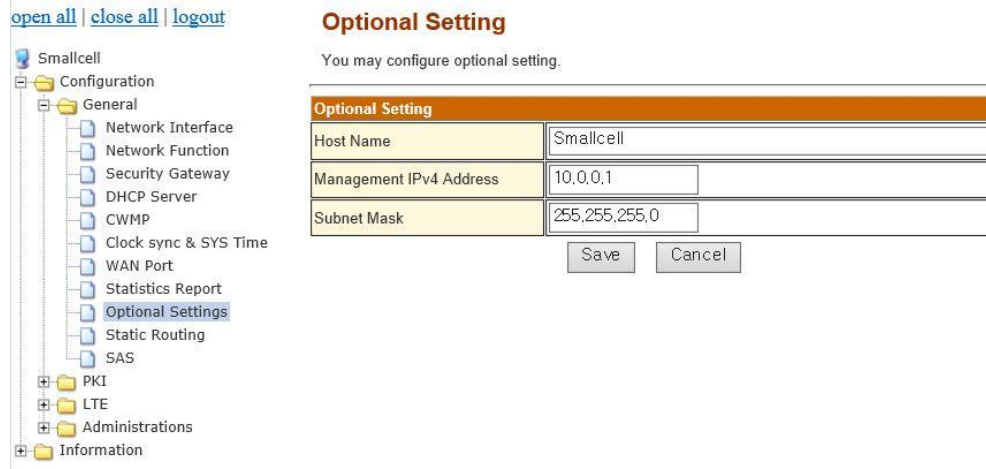
Ftp server configuration	
Mode	Enable
IP address	96.37.190.10
User ID	juni
Password	.....

Apply Cancel

**Figure 25: 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.



**Figure 26: 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.

### 6.2.1.11 SAS

From the tree menu, select SAS to move onto the SAS Setup page for configuring enable/disable of SAS Mode. After changing SAS Mode 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

### Static Routing

You may configure static routing settings..

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

Current static route (Num:1)			DEL
Index			All <input type="checkbox"/>
1	IP Type	IPv4	<input type="checkbox"/>
	Name	TEST	
	IP Address	10.1.35.0	
	Mask	255.255.255.0	
	Gateway	10.1.35.1	

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- 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

### SAS Setup

You may configure SAS settings.

SAS Mode	
SAS Mode	Disable
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>	

Reset SAS settings	
SAS Reset Button	<input type="button" value="SAS Reset"/>

**Figure 27: Static Routing& SAS**

---

## 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 a 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 you 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.

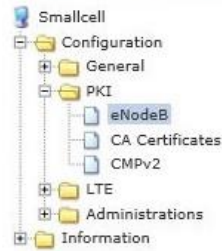
The forth, last, table in PKI Status section, called 'Private key and Certificates Status', shows current status of PKI system i.e., pairness of private key and certificate, validity of certificate, and trust chain between certificate and CA certificate. The last one will be mentioned again in CA Certificates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

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 forth, 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.



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### 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	<input type="radio"/> Generate key internally <input checked="" type="radio"/> Import key externally
Select private key file	<input type="button" value="Choose File"/> No file chosen
Passphrase of private key file	<input type="text"/> (Blank for no passphrase)
<input type="button" value="Import"/> <input type="button" value="Cancel"/>	

#### eNodeB Certificate

No certificate for eNodeB	
Select certificate file	<input type="button" value="Choose File"/> No file chosen
<input type="button" value="Import"/> <input type="button" value="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	<input type="text" value="/CN=JLT626-626T014D6500003"/> <input type="button" value="Generate CSR"/>
<input type="button" value="Export"/> <input type="button" value="Cancel"/>	

### PKI Status

#### Private key and Certificates Status

Private key / certificate pair	FAILED
Certificate validity	FAILED
Certificate trust chain	FAILED

Figure 28: eNodeB Private Key and Certificate

### 6.2.2.2 CA Certificates

CA certificates can be handled in 'CA Certificates' page.

This page allows you to import and delete CA certificates and shows the information of chosen CA certificate in a box. To pass the trust chain status (the last status in the table mentioned above) in PKI Status section, the current eNodeB certificate must be issued by current CA certificate stored in the eNodeB.



**Figure 29: 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 6.2.2.2CA 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.

The very bottom box, called 'Result of CMPv2 Request', 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 <i>(IP address or FQDN[:port][/path/to])</i>	10.1.35.100:4711
Margin time for automatic KUR <i>(Certificate renewal ahead of expiry)</i>	0 days (1~9999, 0:disable)
Recipient DN <i>(For sending automatic CMP IR)</i>	/O=Ericsson/CN=LTEIP

### 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	<input checked="" type="radio"/> IR - by Ref. value and IAK <input type="radio"/> IR - by the installed certificate <input type="radio"/> KUR - for certificate renewal
Recipient DN	/O=Ericsson/CN=LTEIP SecNEcusRootCA
Subject DN	
Reference value	
IAK (Initial Autentication Key)	

Result of CMPv2 Request
<div style="text-align: center;"> <span>&lt;</span> <span>&gt;</span> </div>

Figure 30: CMPv2

## 6.2.3 LTE 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 31. eNodeB basic system parameters including TDD configuration (Subframe Assignment and Special Subframe Pattern) can be amended by clicking Apply button.



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

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

- Smallcell
  - Configuration
    - General
    - PKI
    - LTE
      - Basic**
      - RF
      - S1AP
      - MR
      - LA
      - Neighbor Cell
      - UTRA Frequency
      - UTRA Neighbor Cell
      - GERAN Frequency
      - GERAN Neighbor Cell
      - DSCP Mapping
      - CSG
      - REM/SON
    - Administrations
  - Information

### eNodeB Basic Configuration

You may configure LTE basic settings.

eNodeB Basic Configuration	
eNodeB Type	Home ▼
Cell ID	1
TA Code	3
PCI	1
Freq Band Indicator	40
eNodeB ID	SL00000001
eNodeB Name	JLT626
DL EARFCN	39150
UL EARFCN	39150
Bandwidth	10
No. of PLMN ID	1 ▼
PLMN ID 1	00103
Cell reserved for operator use 1	Not Reserved ▼
Cell Barred	Not Barred ▼
Intra Freq Reselection	Allowed ▼
q-RxLevMin (-77 ~ -22)	-60 x2 dBm (SIB1)
Subframe Assignment	sa2 ▼
Special Subframe Patterns	ssp7 ▼

E-UTRA frequency	
No. of E-UTRA	1 ▼

EUTRA Frequency 1	
DL EARFCN	39150
UL EARFCN	39150
CELL Reselection Priority	7
Offset Frequency	0 dB ▼
HO Restrict	Disable ▼

Smallcell PCI	
Start	500
Range	0

**Figure 31: eNodeB Basic Configuration MENU**

### 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 32) indicates the RF is turned on and can be switched off by clicking the BLOCK button. (RF will be switched ON only if the ELT-622PI has the S1 connection with MME.)

The red BLOCK status (as shown in Figure 33) indicates the RF is turned off but can be switched on by clicking UN-BLOCK button. (RF can be switched OFF even though ELT-622PI 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.

The screenshot shows the 'LTE RF Configurations' page. On the left is a tree menu with 'RF' selected under the 'LTE' folder. The main panel has a title 'LTE RF Configurations' and a subtitle 'You may configure RF settings for LTE service here.' Below this is a table with the following data:

RF Configurations		
RF transmission control	UN-BLOCK	BLOCK
Tx Power[Main]	21	dBm [0 ~ 21]
Tx Power[Mimo]	21	dBm [0 ~ 21]

Buttons for 'Apply' and 'Cancel' are located below the table.

Figure 32: RF Block

The screenshot shows the 'LTE RF Configurations' page. On the left is a tree menu with 'RF' selected under the 'LTE' folder. The main panel has a title 'LTE RF Configurations' and a subtitle 'You may configure RF settings for LTE service here.' Below this is a table with the following data:

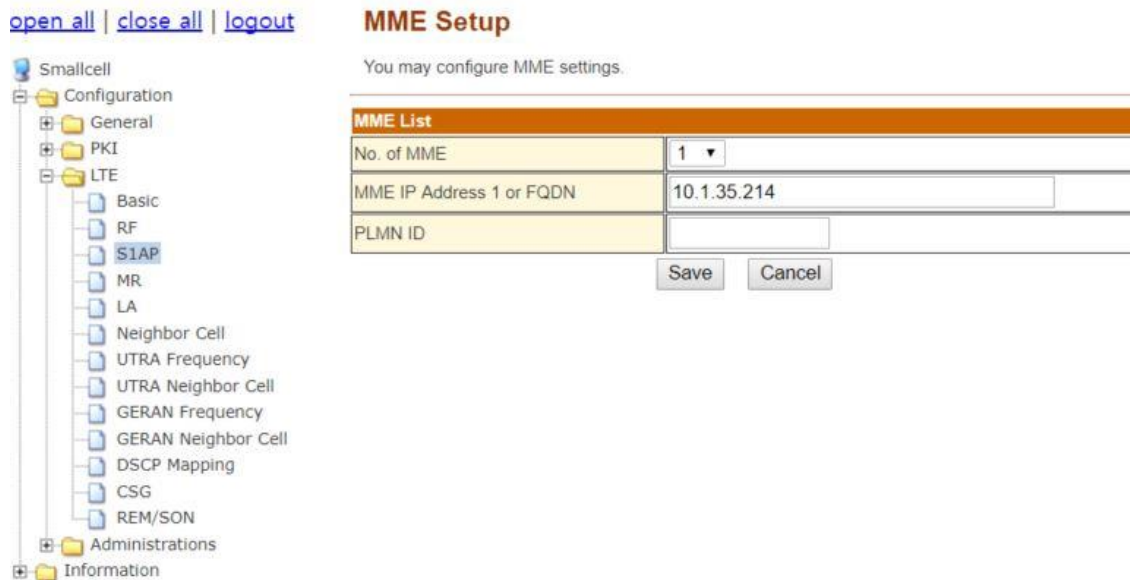
RF Configurations		
RF transmission control	BLOCK	UN-BLOCK
Tx Power[Main]	21	dBm [0 ~ 21]
Tx Power[Mimo]	21	dBm [0 ~ 21]

Buttons for 'Apply' and 'Cancel' are located below the table.

Figure 33: RF Un-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.



**Figure 34: MME Setup**

### 6.2.3.4 MR

From the tree menu, you can select MR to move on to the measurement report setup page. Choose one of trigger quantities (RSRP, RSRQ, RSCP, Ec/No) from the list. Insert threshold value and click the Save button. Please refer to Table 12 for the detailed input parameter information.

\* All units are defined reported value from TS36133 (RSRP: 9.1.4, RSRQ: 9.1.7), TS25133 (RSCP: 9.1.1.3, Ec/No: 9.1.2.3).

Menu	Description
<b>Intra-frequency EUTRAN HO</b>	Select the Event A3 or A4. If you select event A3, then A3 is supported. (Event A4 is the same as A3.)
<b>Inter-frequency EUTRAN HO</b>	Select the Event A3 or A5. If you select event A3, then A3 is supported. (Event A5 is the same as A3.)
<b>Inter-RAT HO/Redirect/SRVCC</b>	Select the Event B1 or B2. If you select event B1 then B1 is supported. (Event B2 is the same as B1.)
<b>A1, A3, A4</b>	Select the type of trigger quantities for each event.
<b>A2</b>	Select the type of trigger quantities for each event. There are 4 options in A2 Event. Inter-freq Ho, Inter-RAT HO/REDIR, SRVCC, Blind Redirection. If you don't want to use event, then insert 0 in threshold value.
<b>RSRP, range: [0, 97]</b>	Insert RSRP threshold for each event.
<b>RSRQ, range: [0, 34]</b>	Insert RSRQ threshold for each event.
<b>Intra-Freq HO/ANR range: [-30, 30]</b>	Insert Intra-Freq HO/ANR offset value.

<b>A5</b>	A5(Inter-Freq Ho, Inter-Freq ANR) threshold range is RSRP/Q1 - RSRP/Q2
<b>B1 ( UTRA ) B2 ( UTRA / GERAN )</b>	Select the type of trigger quantity to each event (Default: RSCP).
<b>RSCP, range: [-5, 91]</b>	Insert a RSCP threshold values for each event
<b>Ec/No, range: [0, 63]</b>	Insert an Ec/No threshold values for each event
<b>RSSI, range: [0, 63]</b>	Insert threshold value to each event (B1, B2).

**Table 12: Description of MR parameter**

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- Smallcell
  - Configuration
    - General
    - PKI
    - LTE
      - Basic
      - RF
      - S1AP
      - MR**
      - LA
      - Neighbor Cell
      - UTRA Frequency
      - UTRA Neighbor Cell
      - GERAN Frequency
      - GERAN Neighbor Cell
      - DSCP Mapping
      - CSG
      - REM/SON
    - Administrations
  - Information

### MR Event threshold configuration

You may configure threshold settings for measurement events.  
\* All units are defined reported value. if you want to know about db/dBm value, refer to formula next to the textbox.  
**WARNING: Ec/No is N/A for 'UTRAN TDD'**

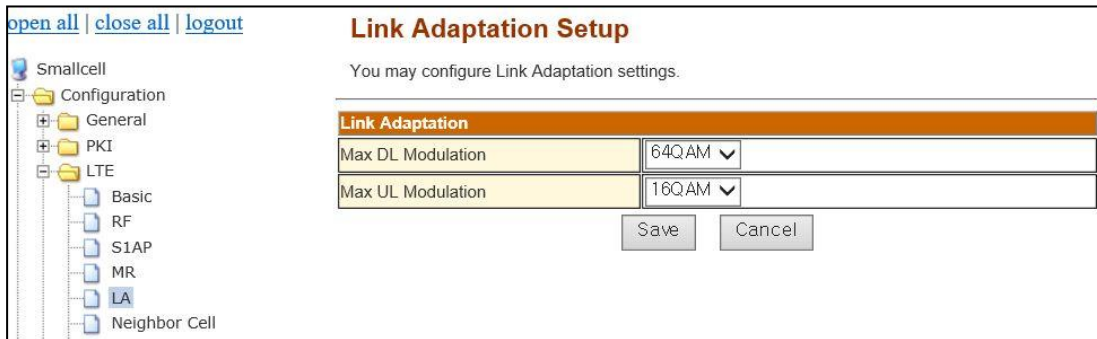
Event Selection		
Intra-frequency EUTRAN HO	Event A3 ▼	
Inter-frequency EUTRAN HO	Event A3 ▼	
Inter-RAT HO/Redirect/SRVCC	Event B2 ▼	
A1 (Serving becomes better than threshold)		
Trigger Quantity	RSRP ▼	
RSRP, range: [0, 97]	97	(Value-140) dBm
A2 (Serving becomes worse than threshold)		
Inter-Freq HO	RSRP ▼	
RSRP, range: [0, 97]	40	(Value-140) dBm
Inter-RAT HO/REDIR	RSRP ▼	
RSRP, range: [0, 97]	0	(Value-140) dBm
SRVCC	RSRP ▼	
RSRP, range: [0, 97]	0	(Value-140) dBm
Blind Redirection	RSRP ▼	
RSRP, range: [0, 97]	0	(Value-140) dBm
A3 (Neighbor becomes offset better than serving)		
Trigger Quantity	RSRP ▼	
Intra-Freq HO, range: [-30, 30]	6	Value/2 dB
Intra-Freq ANR, range: [-30, 30]	0	Value/2 dB
A4 (Neighbor becomes better than threshold)		
Trigger Quantity	RSRP ▼	
RSRP, range: [0, 97]	97	(Value-140) dBm
A5 (Serving becomes worse than Th1 AND Neighbor becomes better than Th2)		
Inter-Freq HO	RSRP ▼	
RSRP1, range: [0, 97]	40	(Value-140) dBm
RSRP2, range: [0, 97]	43	(Value-140) dBm
Inter-Freq ANR	RSRP ▼	
RSRP1, range: [0, 97]	40	(Value-140) dBm
RSRP2, range: [0, 97]	40	(Value-140) dBm
B1 (Inter-RAT neighbor becomes better than threshold)		
UTRA	RSCP ▼	
RSCP, range: [-5, 91]	65	(Value-115) dBm
GERAN RSSI, range: [0, 63]	32	(Value-110) dBm
B2 (Serving becomes worse than Th1 and Inter-RAT neighbor becomes better than Th2)		
UTRA Th1	RSRP ▼	
RSRP, range: [0, 97]	70	(Value-140) dBm
UTRA Th2	RSCP ▼	
RSCP, range: [-5, 91]	65	(Value-155) dBm
GERAN Th1	RSRP ▼	
RSRP, range: [0, 97]	70	(Value-140) dBm
GERAN Th2, RSSI range: [0, 63]	32	(Value-110) dBm

Save Cancel

**Figure 35:A1 - A5, B1, B2 MR Setup menu**

### 6.2.3.5 LA

From the tree menu, select LA to move onto the Link Adaptation Setup page. Set Max DL Modulation and Max UL Modulation and click the Save button. Restart the system to apply the change(s).



**Figure 36: Link Adaptation Setup**



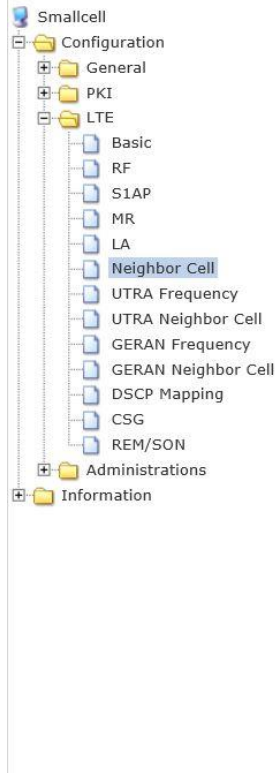
### 6.2.3.6 Neighbor Cell

From the tree menu, select Neighbor Cell to move onto the Neighbor Cell setup page. You can Add Neighbor Cell and modify/delete a registered neighbor cells.

Please refer to Table 13 for detailed input parameter information. Like other setting procedure, the changes must be saved.

Menu	Description
<b>eNodeB Type</b>	Select the type of Neighbor Cell (Default: Macro).
<b>Neighbor Cell IP Address</b>	<b>Null(default)</b> If the Femto type is selected, so this value should remain as 0.0.0.0.
<b>Cell ID</b>	Insert eNodeB ID of Neighbor Cell.
<b>PLMN ID</b>	Insert PLMN ID of the Neighbor Cell. <b>(Default: 8)</b> .
<b>TAC</b>	Insert TAC of the Neighbor Cell.
<b>PCI</b>	Insert PCI of the Neighbor Cell.
<b>DL EARFCN</b>	Insert DL EARFCN of Neighbor Cell. This must be the frequency value included within EUTRA Frequency under basic menu) <b>(Default: 39150 for Band 40)</b> .
<b>UL EARFCN</b>	Insert UL EARFCN of Neighbor Cell. This must be the frequency value included within EUTRA Frequency under basic menu) <b>(Default: 39150 for Band 40)</b> .
<b>QOFFSET</b>	Insert q-OFFSET of the Neighbor Cell (Default :0)
<b>X2 Trigger</b>	Select the type of handover Handover <b>(Default: 0)</b> . If the Femto type is selected, this value should remain as 0 <b>(S1-based HO: 0 and X2-based HO: 1 )</b> .
<b>Access Mode</b>	Select the type of Access Mode (Default: Open).
<b>CSG ID</b>	Insert CSG ID of the Neighbor Cell

**Table 13: Description of Neighbor Cell Parameter**



## Neighbor Cell Configuration

### Registered Neighbor Cells

- You can check the neighbor cells currently registered.
- To delete a neighbor cell, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of Neighbor Cells : 0

### Add a New Neighbor Cell

- You may add a new Neighbor Cell.
- You can add up to a maximum of 16 neighbor cells.
- To add, fill up the form below and press 'Add' button.

Neighbor Cell Addition Form			
IP Type	<input type="text" value="IPv4"/>		
IP Address	<input type="text" value="0.0.0.0"/>		
eNodeB Type	<input type="text" value="Macro"/>	Access Mode	<input type="text" value="Open"/>
Cell ID	<input type="text" value="0"/>	PLMN ID	<input type="text" value="45008"/>
TAC	<input type="text" value="1"/>	PCI	<input type="text" value="141"/>
DL EARFCN	<input type="text" value="56340"/>	UL EARFCN	<input type="text" value="56340"/>
q-OffsetCell	<input type="text" value="0"/> dB	X2 Trigger	<input type="text" value="Disable"/>
CSG ID	<input type="text" value="0"/>		
<input type="button" value="Add"/>		<input type="button" value="Cancel"/>	

Figure 37: Add Neighbor Cell configuration

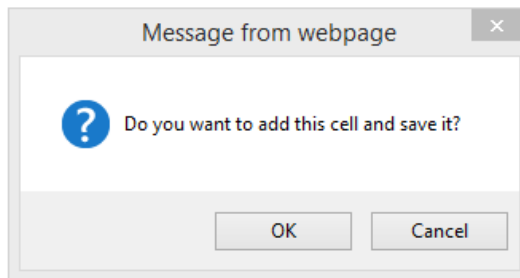
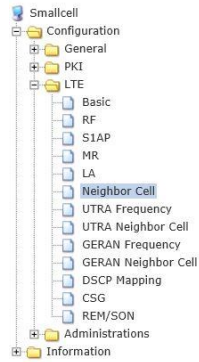


Figure 38: Add Confirmation Window

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- You can check the neighbor cells currently registered.
- To delete a neighbor cell, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of Neighbor Cells : 1

Neighbor Cell:0	Modify	Delete
IP Type	IPv4	
IP Address	0,0,0,0	
eNodeB Type	Macro	Op Mode OAM
X2 Link Status	DOWN	PCI 141
Access Mode	Open	Cell ID 0
PLMN ID	45008	TAC 1
X2 Trigger	Disable	q-OffsetCell 0 dB
DL EARFCN	56340	UL EARFCN 56340
CSG ID	0	

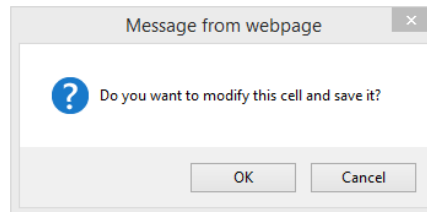
**Add a New Neighbor Cell**

- You may add a new Neighbor Cell.
- You can add up to a maximum of 16 neighbor cells.
- To add, fill up the form below and press 'Add' button.

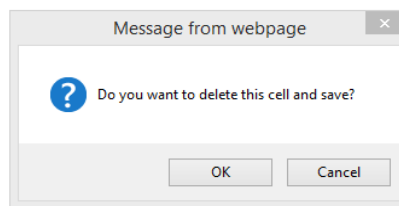
Neighbor Cell Addition Form

IP Type	IPv4		
IP Address	0,0,0,0		
eNodeB Type	Macro	Access Mode	Open
Cell ID	0	PLMN ID	45008
TAC	1	PCI	141
DL EARFCN	56340	UL EARFCN	56340
q-OffsetCell	0 dB	X2 Trigger	Disable
CSG ID	0		

**Figure 39: Neighbor Cell Information registered.**



**Figure 40: Modify Confirmation Window**



**Figure 41: Delete Confirmation Window**

### 6.2.3.7 UTRA Frequency

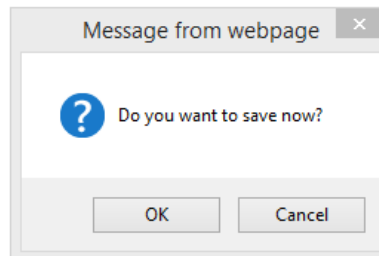
From the tree menu, select UTRA Frequency to move onto the UTRA Frequency setup page. You can add a UTRA Frequency, and modify/delete a registered UTRA Frequency. If inter-RAT Handover to UTRA Frequency is required, please choose Handover in Mobility to UTRA. Please refer to Table 14 for detailed input parameter information.

Menu	Description
<b>Mobility to UTRA</b>	
<b>UTRA FDD /TDD</b>	Select <b>Handover</b> or <b>Redirection</b> (Default: Handover).
<b>UTRA Frequency Form</b>	
<b>Duplex</b>	Select type of duplex (Default: TDD).
<b>Band Indicator</b>	Case of TDD, Band indicator is enable (Band A - Band F).
<b>Thresh X High</b>	Insert Thresh X High of UTRA Frequency.
<b>Thresh X Low</b>	Insert Thresh X Low of UTRA Frequency.
<b>Offset Frequency</b>	Insert Offset Frequency of UTRA Frequency.
<b>CSFB</b>	Select type of CSFB (Default: Yes).
<b>Cell Reselection Priority</b>	Insert Cell Reselection Priority of UTRA Frequency.
<b>DL ARFCN</b>	Insert DL ARFCN of UTRA Frequency (Default: 9550).
<b>UL ARFCN</b>	Insert UL ARFCN of UTRA Frequency (Default: 0).
<b>Qrxlevmin</b>	Insert Qrxlevmin of UTRA Frequency.
<b>Pmax UTRA</b>	Insert Pmax UTRA of UTRA Frequency.
<b>QqualMin</b>	Insert QqualMin of UTRA Frequency.

**Table 14: Description of UTRA Frequency Parameter**

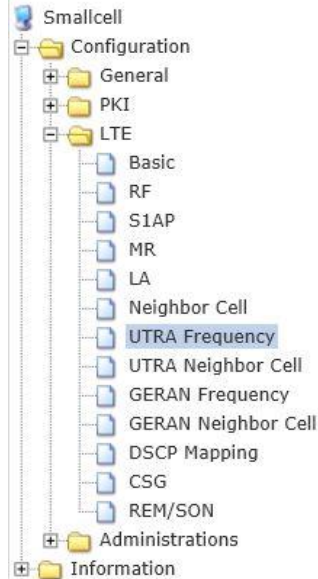


**Figure 42: Handover or Redirection setup menu**



**Figure 43: Save confirmation window**

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## UTRA Frequency Configuration

Mobility to UTRA			
UTRA FDD	Handover	UTRA TDD	Handover
Save		Cancel	

### Registered UTRA Frequencies

- You can check the UTRA Frequencies currently registered.
- To delete a UTRA Frequency, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of UTRA Frequencies : 0

### Add a New UTRA Frequency

- You may add a new UTRA Frequency.
- You can add up to a maximum of 16 UTRA Frequencies.
- To add, fill up the form below and press 'Add' button.

UTRA Frequency Addition Form			
Duplex	TDD		
Band Indicator	BAND_A		
Thresh X High	0	Thresh X Low	0
Offset Frequency	0	CSFB	Yes
DL ARFCN	9550	UL ARFCN	0
Cell Reselection Priority	4	QrxlevMin	-50
Pmax Utra	0	QqualMin	-24
Add		Cancel	

Figure 44: Add UTRA Frequency configuration

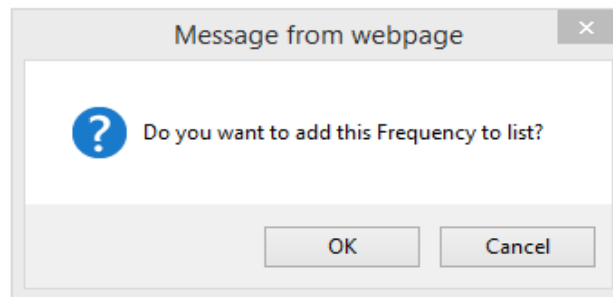
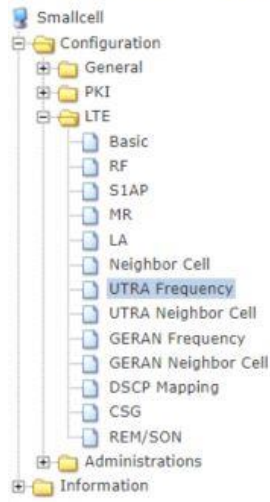


Figure 45: Add Confirmation Window

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### UTRA Frequency Configuration

<b>Mobility to UTRA</b>			
UTRA FDD	Handover ▾	UTRA TDD	Handover ▾
<input type="button" value="Save"/> <input type="button" value="Cancel"/>			

#### Registered UTRA Frequencies

- You can check the UTRA Frequencies currently registered.
- To delete a UTRA Frequency, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of UTRA Frequencies : 1

UTRA Frequency:0				Modify	Delete
Duplex		TDD ▾			
Band Indicator		BAND_A ▾			
DL ARFCN	9550	UL ARFCN	0		
Thresh X High	0	Thresh X Low	0		
CSFB	YES ▾	Offset Frequency	0		
Cell Reselection Priority	4	QrxlevMin	-50		
Pmax Utra	0	QqualMin	-24		

#### Add a New UTRA Frequency

- You may add a new UTRA Frequency.
- You can add up to a maximum of 16 UTRA Frequencies.
- To add, fill up the form below and press 'Add' button.

UTRA Frequency Addition Form			
Duplex		TDD ▾	
Band Indicator		BAND_A ▾	
Thresh X High	0	Thresh X Low	0
Offset Frequency	0	CSFB	Yes ▾
DL ARFCN	9550	UL ARFCN	0
Cell Reselection Priority	4	QrxlevMin	-50
Pmax Utra	0	QqualMin	-24
<input type="button" value="Add"/> <input type="button" value="Cancel"/>			

Figure 46: UTRA Frequency Information registered

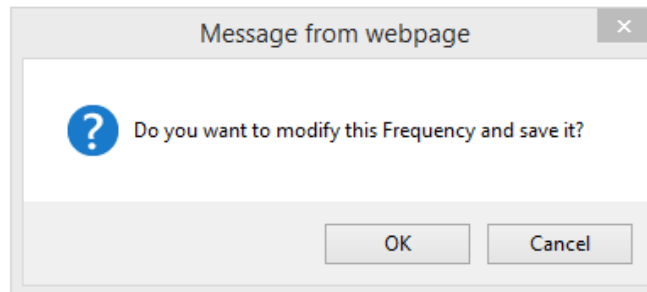
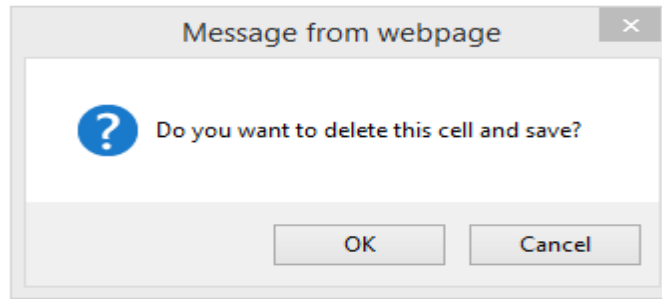


Figure 47: Modify Confirmation Window



**Figure 48: Delete Confirmation Window**

### 6.2.3.8 UTRA Neighbor Cell

From the tree menu, select UTRA Neighbor Cell to move onto the UTRA Neighbor Cell setup page. You can Add UTRA Neighbor Cell and modify/delete a registered UTRA Neighbor Cell. If inter-RAT Handover to UTRA Neighbor Cell is required, please choose Handover in Mobility to UTRA. Please refer to Table 15 for detailed input parameter information

Menu	Description
<b>Mobility to UTRA</b>	
<b>UTRA FDD / TDD</b>	Select <b>Handover</b> or <b>Redirection</b> (Default: Handover).
<b>UTRA Neighbor Cell Form</b>	
<b>RNC ID</b>	Insert RNC ID of UTRA Neighbor cell.
<b>CELL ID</b>	Insert CELL ID of UTRA Neighbor cell.
<b>IP Address</b>	Insert IP Address of UTRA Neighbor cell.
<b>PLMN ID</b>	Insert PLMN ID of UTRA Neighbor cell.
<b>DL ARFCN</b>	Insert DL ARFCN of UTRA Neighbor cell. (This must be the frequency value included within UTRA Frequency under basic menu)
<b>UL ARFCN</b>	Insert UL ARFCN of UTRA Neighbor cell. (This must be the frequency value included within UTRA Frequency under basic menu)
<b>LAC</b>	Insert LAC of UTRA Neighbor cell.
<b>RAC</b>	Insert RAC of UTRA Neighbor cell.
<b>URA</b>	Insert URA of UTRA Neighbor cell.
<b>PCS</b>	Insert PCS of UTRA Neighbor cell.
<b>Pcpich Tx Power</b>	Insert Pcpich Tx Power of UTRA Neighbor cell.
<b>Duplex</b>	Select type of duplex (Default: FDD).
<b>Ccpch Tx Power</b>	Insert Ccpch Tx Power of UTRA Neighbor cell.
<b>Is Rim Supported</b>	Insert Is Rim Supported of UTRA Neighbor cell.

**Table 15: Description of UTRA Neighbor Cell Parameter**



Figure 49: Handover or Redirection setup menu

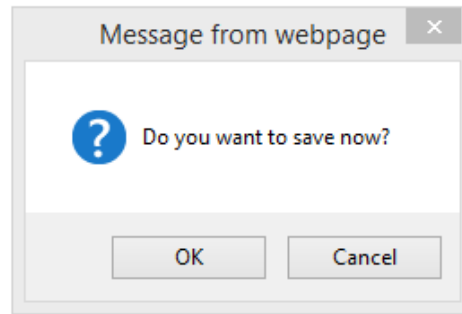


Figure 50: Save confirmation window

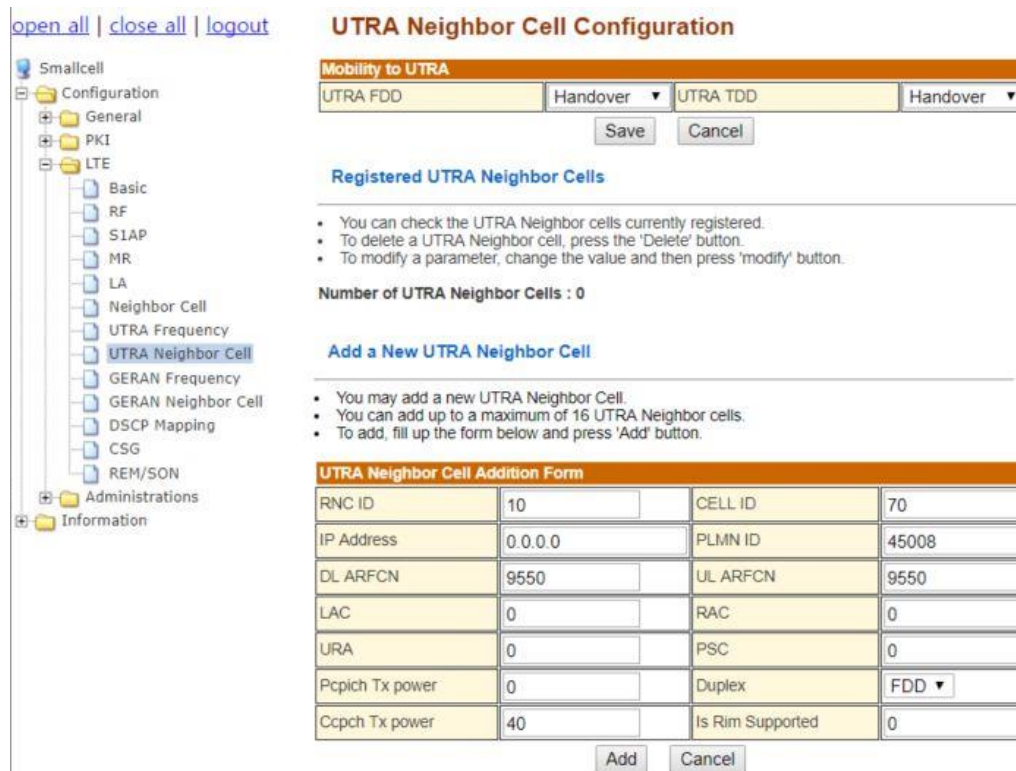


Figure 51: Add UTRA Neighbor Cell configuration



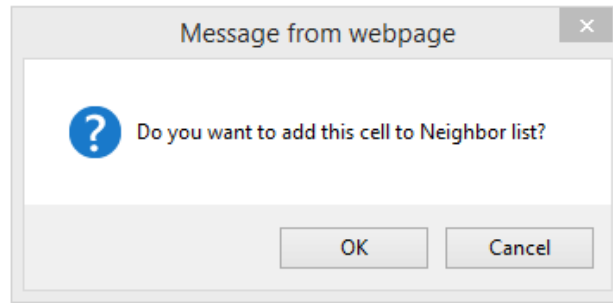


Figure 52: Add Confirmation Window

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

Smallcell

- Configuration
  - General
  - PKI
  - LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell**
    - GERAN Frequency
    - GERAN Neighbor Cell
    - DSCP Mapping
    - CSG
    - REM/SON
- Administrations
- Information

### UTRA Neighbor Cell Configuration

**Mobility to UTRA**

UTRA FDD  UTRA TDD

**Registered UTRA Neighbor Cells**

- You can check the UTRA Neighbor cells currently registered.
- To delete a UTRA Neighbor cell, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of UTRA Neighbor Cells : 1

UTRA Neighbor Cell:0			
	Modify		Delete
RNC ID	<input type="text" value="10"/>	CELL ID	<input type="text" value="70"/>
IP Address	<input type="text" value="0.0.0.0"/>	PLMN ID	<input type="text" value="45008"/>
DL ARFCN	<input type="text" value="9550"/>	UL ARFCN	<input type="text" value="9550"/>
LAC	<input type="text" value="0"/>	RAC	<input type="text" value="0"/>
URA	<input type="text" value="0"/>	PSC	<input type="text" value="0"/>
Pcpich Tx Power	<input type="text" value="0"/>	Duplex	<input type="text" value="FDD"/>
Ccpch Tx Power	<input type="text" value="40"/>	Is Rim Supported	<input type="text" value="0"/>
Op Mode	<input type="text" value="OAM"/>		

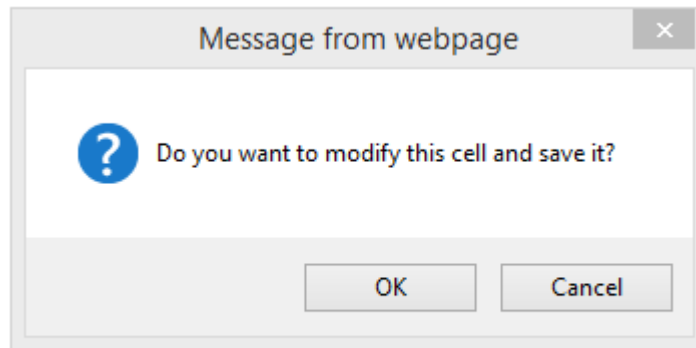
**Add a New UTRA Neighbor Cell**

- You may add a new UTRA Neighbor Cell.
- You can add up to a maximum of 16 UTRA Neighbor cells.
- To add, fill up the form below and press 'Add' button.

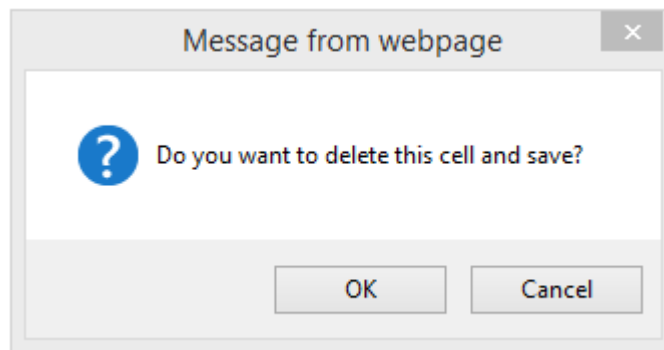
**UTRA Neighbor Cell Addition Form**

RNC ID	<input type="text" value="10"/>	CELL ID	<input type="text" value="70"/>
IP Address	<input type="text" value="0.0.0.0"/>	PLMN ID	<input type="text" value="45008"/>
DL ARFCN	<input type="text" value="9550"/>	UL ARFCN	<input type="text" value="9550"/>
LAC	<input type="text" value="0"/>	RAC	<input type="text" value="0"/>
URA	<input type="text" value="0"/>	PSC	<input type="text" value="0"/>
Pcpich Tx power	<input type="text" value="0"/>	Duplex	<input type="text" value="FDD"/>
Ccpch Tx power	<input type="text" value="40"/>	Is Rim Supported	<input type="text" value="0"/>

Figure 53: Modify and Delete UTRA Neighbor Cell configuration



**Figure 54: Modify Confirmation Window**



**Figure 55: Delete Confirmation Window**

### 6.2.3.9 GERAN Frequency

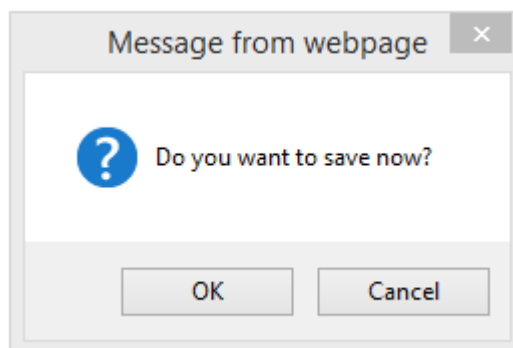
From the tree menu, select GERAN Frequency to move onto the GERAN Frequency setup page. You can add a GERAN Frequency and delete a registered GERAN Frequency. If inter-RAT Handover to GERAN is required, please choose Handover in Mobility to GERAN. Please refer to Table16 for detailed input parameter information.

Menu	Description
<b>Mobility to GERAN</b>	
<b>GERAN</b>	Select <b>Handover</b> or <b>Redirection</b> (Default: Handover).
<b>GERAN Frequency Form</b>	
<b>Starting ARFCN</b>	Insert Starting ARFCN of GERAN Frequency (Range: 0 - 1023).
<b>PCS 1900</b>	Select the type of band (Default: No).
<b>Cell Reselection Priority</b>	Insert Starting ARFCN of GERAN Frequency.
<b>Thresh X high</b>	Insert Thresh X high of GERAN Frequency.
<b>Thresh X low</b>	Insert Thresh X low of GERAN Frequency.
<b>Qrxlevmin</b>	Insert Qrxlevmin of GERAN Frequency.
<b>Pmax GERAN</b>	Insert Pmax GERAN of GERAN Frequency.
<b>CSFB</b>	Select type of CSFB (Default: No).
<b>Offset Frequency</b>	Insert Offset Frequency of GERAN Frequency.
<b>NCC Permitted</b>	Insert NCC Permitted of GERAN Frequency.
<b>No. of Explicit arfcn</b>	You can select the number of explicit arfcn (Default: 0).
<b>Explicit ARFCN 1 - 16</b>	Insert Explicit ARFCN of GERAN Frequency (Range: 0 - 1023).

**Table 16: Description of GERAN Frequency Parameter**



**Figure 56: Handover or Redirection setup menu**



**Figure 57: Save confirmation window**

open all | close all | logout

- Smallcell
- Configuration
  - General
  - PKI
  - LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell
    - GERAN Frequency**
    - GERAN Neighbor Cell
    - DSCP Mapping
    - CSG
    - REM/SON
- Administrations
- Information

### GERAN Frequency Configuration

**Mobility to GERAN**

GERAN  Handover ▼

Save Cancel

**Registered GERAN Frequencies**

- You can check the GERAN Frequencies currently registered.
- To delete a GERAN Frequency, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

Number of GERAN Frequencies : 0

**Add a New GERAN Frequency**

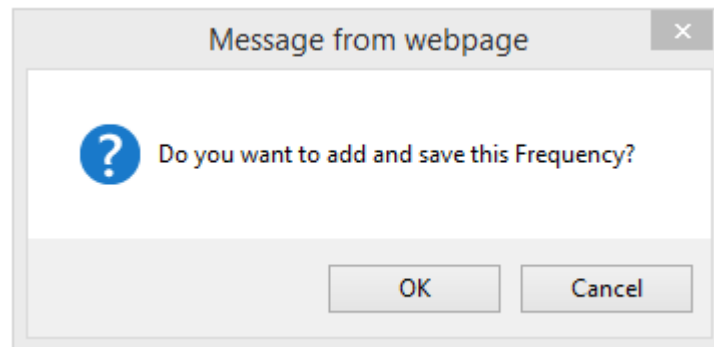
- You may add a new GERAN Frequency.
- You can add up to a maximum of 16 GERAN Frequencies.
- To add, fill up the form below and press 'Add' button.

**GERAN Frequency Addition Form**

Starting ARFCN	<input type="text" value="0"/>	PCS1900	No ▼
Cell Reselection Priority	<input type="text" value="0"/>	Thresh X high	<input type="text" value="0"/>
Thresh X low	<input type="text" value="0"/>	Qrxlevmin	<input type="text" value="0"/>
Pmax Geran	<input type="text" value="0"/>	CSFB	<input type="text" value="0"/>
Offset Frequency	<input type="text" value="0"/>	NCC Permitted	<input type="text" value="0"/>
No. of Explicit arfcn	<input type="text" value="0"/> ▼		

Add Cancel

**Figure 58: Add GERAN Frequency configuration**



**Figure 59: Add confirmation window**

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

Smallcell

- Configuration
  - General
  - PKI
  - LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell
    - GERAN Frequency**
    - GERAN Neighbor Cell
    - DSCP Mapping
    - CSG
    - REM/SON
- Administrations
- Information

### GERAN Frequency Configuration

**Mobility to GERAN**

GERAN Handover ▼

Save    Cancel

**Registered GERAN Frequencies**

- You can check the GERAN Frequencies currently registered.
- To delete a GERAN Frequency, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

**Number of GERAN Frequencies : 1**

GERAN Frequency:0	Modify			Delete
Starting ARFCN	0	PCS1900	No ▼	
Thresh X high	0	Thresh X low	0	
Qrxlevmin	0	Cell Reselection Priority	0	
Pmax Geran	0	CSFB	No ▼	
Offset Frequency	0	NCC Permitted	0	
No. of Explicit arfcn		0 ▼		

**Add a New GERAN Frequency**

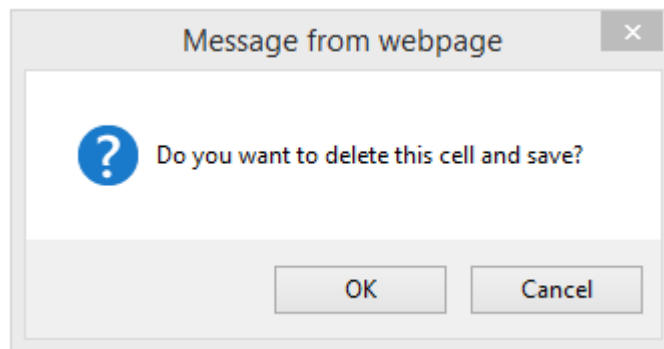
- You may add a new GERAN Frequency.
- You can add up to a maximum of 16 GERAN Frequencies.
- To add, fill up the form below and press 'Add' button.

**GERAN Frequency Addition Form**

Starting ARFCN	0	PCS1900	No ▼
Cell Reselection Priority	0	Thresh X high	0
Thresh X low	0	Qrxlevmin	0
Pmax Geran	0	CSFB	0
Offset Frequency	0	NCC Permitted	0
No. of Explicit arfcn		0 ▼	

Add    Cancel

**Figure 60: Registered GERAN Frequency configuration**



**Figure 61: Delete confirmation window**

### 6.2.3.10 GERAN Neighbor Cell

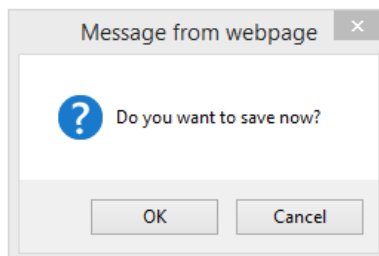
From the tree menu, select GERAN Neighbor Cell to move onto the GERAN Neighbor Cell setup page. You can Add GERAN Neighbor Cell and modify/delete registered GERAN Neighbor Cell. Inter-RAT Handover to GERAN Neighbor Cell is required. Please choose Handover in Mobility to UTRA. Please refer to Table 17 for detailed input parameter information.

Menu	Description
<b>Mobility to GERAN</b>	
<b>GERAN</b>	Select <b>Handover</b> or <b>Redirection</b> (Default: Handover).
<b>GERAN Neighbor Cell Form</b>	
<b>PLMN ID</b>	Insert PLMN ID of GERAN Neighbor Cell.
<b>LAC</b>	Insert LAC of GERAN Neighbor Cell.
<b>RAC</b>	Insert RAC of GERAN Neighbor Cell.
<b>BSIC</b>	Insert BSIC of GERAN Neighbor Cell.
<b>CI</b>	Insert CI of GERAN Neighbor Cell.
<b>PCS 1900</b>	Select the type of band (Default: No).
<b>BCCHARFCN</b>	Insert BCCHARFCN of GERAN Neighbor Cell (Range: 0 - 1023). (This must be the frequency value included within GERAN Frequency under basic menu.)
<b>NCC Permitted Meas</b>	Insert NCC Permitted Meas of GERAN Neighbor Cell.
<b>NCO Val</b>	Insert NCO Val of GERAN Neighbor Cell.
<b>Is DTM Capable</b>	Insert Is DTM Capable of GERAN Neighbor Cell.
<b>Is RIM Supported</b>	Insert Is RIM Supported of GERAN Neighbor Cell.

**Table 17: Description of GERAN Neighbor Cell Parameter**



**Figure 62: Handover or Redirection setup menu**



**Figure 63: Save confirmation window**

open all | close all | logout

Smallcell

- [-] Configuration
  - [-] General
  - [-] PKI
  - [-] LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell
    - GERAN Frequency
    - GERAN Neighbor Cell
    - DSCP Mapping
    - CSG
    - REM/SON
- [-] Administrations
- [-] Information

### GERAN Neighbor Cell Configuration

**Mobility to GERAN**

GERAN Handover ▼

Save    Cancel

**Registered GERAN Neighbor Cells**

- You can check the GERAN Neighbor cells currently registered.
- To delete a GERAN Neighbor cell, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

**Number of GERAN Neighbor Cells : 0**

**Add a New GERAN Neighbor Cell**

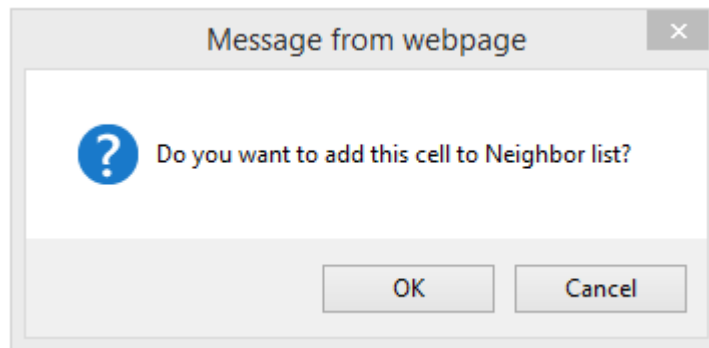
- You may add a new GERAN Neighbor Cell.
- You can add up to a maximum of 16 GERAN Neighbor cells.
- To add, fill up the form below and press 'Add' button.

**GERAN Neighbor Cell Addition Form**

PLMN ID	<input type="text" value="0"/>	LAC	<input type="text" value="0"/>
RAC	<input type="text" value="0"/>	BSIC	<input type="text" value="0"/>
CI	<input type="text" value="0"/>	PCS1900	No ▼
BCCHARFCN	<input type="text" value="0"/>	NCC Permitted Meas	<input type="text" value="0"/>
NCO Val	<input type="text" value="0"/>	Is DTM Capable	<input type="text" value="0"/>
Is RIM Supported	<input type="text" value="0"/>		

Add    Cancel

**Figure 64: Add GERAN Neighbor Cell configuration**



**Figure 65: Add confirmation window**

open all | close all | logout

- Smallcell
- Configuration
  - General
  - PKI
  - LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell
    - GERAN Frequency
    - GERAN Neighbor Cell
    - DSCP Mapping
    - CSG
    - REM/SON
- Administrations
- Information

### GERAN Neighbor Cell Configuration

**Mobility to GERAN**

GERAN Handover ▾

Save    Cancel

**Registered GERAN Neighbor Cells**

- You can check the GERAN Neighbor cells currently registered.
- To delete a GERAN Neighbor cell, press the 'Delete' button.
- To modify a parameter, change the value and then press 'modify' button.

**Number of GERAN Neighbor Cells : 1**

GERAN Neighbor Cell:0	Modify		Delete
PLMN ID	0	LAC	0
RAC	0	BSIC	0
CI	0	PCS1900	No ▾
BCCHARFCN	0	Ncc Permitted Meas	0
Is DTM Capable	0	Is RIM Supported	0
NCO Val	0	Op Mode	OAM

**Add a New GERAN Neighbor Cell**

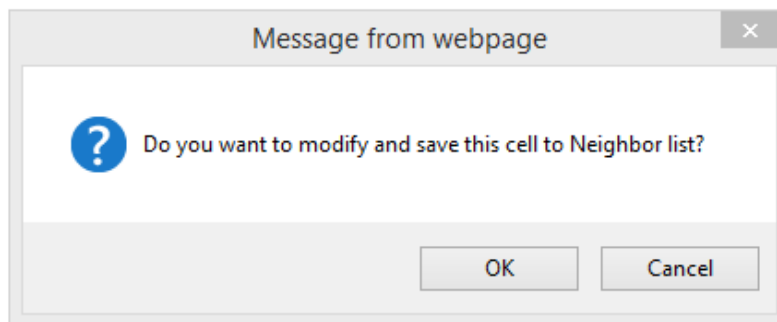
- You may add a new GERAN Neighbor Cell.
- You can add up to a maximum of 16 GERAN Neighbor cells.
- To add, fill up the form below and press 'Add' button.

**GERAN Neighbor Cell Addition Form**

PLMN ID	0	LAC	0
RAC	0	BSIC	0
CI	0	PCS1900	No ▾
BCCHARFCN	0	NCC Permitted Meas	0
NCO Val	0	Is DTM Capable	0
Is RIM Supported	0		

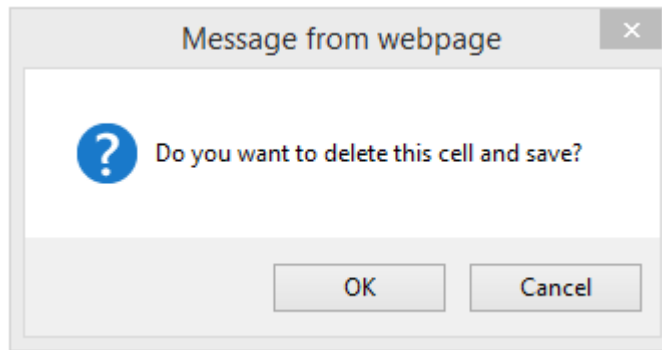
Add    Cancel

**Figure 66: Modify and Delete GERAN Neighbor Cell configuration**



**Figure 67: Modify confirmation window**





**Figure 68: Delete confirmation window**

### 6.2.3.11 DSCP Mapping

From the tree menu, select DSCP Mapping to move onto the DSCP Mapping setup page. Insert the number of DSCP Mapping (0 - 63) and click the Save button then fields will be displayed.

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

- Smallcell
- Configuration
  - General
  - PKI
  - LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell
    - GERAN Frequency
    - GERAN Neighbor Cell
    - DSCP Mapping**
    - CSG
    - REM/SON
  - Administrations
  - Information

### DSCP Mapping Configuration

You may configure DSCP Mapping settings.

QCI and DSCP Mapping	
QCI 1	<input type="text" value="0"/>
QCI 2	<input type="text" value="0"/>
QCI 3	<input type="text" value="0"/>
QCI 4	<input type="text" value="0"/>
QCI 5	<input type="text" value="0"/>
QCI 6	<input type="text" value="0"/>
QCI 7	<input type="text" value="0"/>
QCI 8	<input type="text" value="0"/>
QCI 9	<input type="text" value="0"/>
Other DSCP Mapping	
SCTP	<input type="text" value="0"/>
CWMP	<input type="text" value="0"/>
PTP(1588)	<input type="text" value="0"/>
DNS	<input type="text" value="0"/>
IKE	<input type="text" value="0"/>
CMP	<input type="text" value="0"/>

**Figure 69: DSCP Mapping Configuration**

### 6.2.3.12 CSG

From the tree menu, select CSG Setup to move onto the CSG Setup page. Insert the CSG configured and click the Save button then fields will be displayed.



The screenshot shows the 'CSG Setup' configuration page. On the left is a tree menu with 'CSG' selected under the 'LTE' folder. The main area is titled 'CSG Setup' and contains a 'CSG Configuration' table with the following fields:

CSG Configuration	
Access Mode	Open ▼
CSG ID	0
CSG PCI START	400
CSG PCI RANGE	n0 ▼

Below the table are 'Save' and 'Cancel' buttons.

Figure 70: CSG Setup

### 6.2.3.13 REM/SON

From the tree menu, select REM/SON to move onto the REM and SON Setup page. There are four different functional sections related to REM and SON.

First, you can select REM Scan by selecting 'Scan On Boot' at Opmode of 'REM Scan Configuration' section. In this case, DL earfcn values should be provided at DL EARFCNs to be scanned. The list of DL earfcn values can be added followed by comma. (Comma separated). If you select 'Add to Neighbor Table' option 'Enable', the REM scanned cells are added/updated to ANR. If it is disabled, the scanned cell information is only stored inner database for REM and isn't applied to the ANR.

Click the 'Save' button to apply all the setting you made so far. The saved setting will be applied when the small cell is rebooted. If you don't want to have REM scan option, you can make Opmode 'Disable'. In this case, you can also click 'save' button to apply your change.

PCI Collision/Confusion Detection setting is provided. You can select Collision Alarm and Confusion Alarm by selecting each option 'Enable' individually.

PCI Auto Allocation setting provides PCI auto allocation function. When it is enabled by selecting 'Enable' at 'Auto Allocation', the PCI Auto Allocation function provides the best PCI among the provided PCIs from 'Available PCI List' automatically. EasyCell PCI allocation algorithm selects the best PCI for avoiding PCI collision /confusion and maximizing the PCI reuse distance and reducing the interference of UL channel estimation. The 'Available PCI List' should be provided for the 'Auto Allocation' is 'Enable'. The values are comma separated.

RACH Optimization setting provides the best Root Sequence Index by EasyCell RACH Optimization algorithm. EasyCell RACH optimization algorithm offers the best possible unique root sequence to reduce the ghost preamble detection problem. In this case, you should insert Root sequence Index Range on 'Root Sequence Index Range Start' and 'Root Sequence Index Range End' with first and the last numbers of the range. The number should be in between 1 and 837.

The screenshot displays the 'REM and SON Setup' configuration interface. On the left, a tree menu shows the navigation path: Smallcell > Configuration > LTE > REM/SON. The main configuration area is titled 'REM and SON Setup' and includes the following sections:

- REM Scan Configuration:** Opmode is set to 'Disable'. Buttons for 'Save' and 'Cancel' are present.
- REM Scan Start:** A 'Start' button is available.
- PCI Collision/Confusion Detection:** Both 'Collision Alarm' and 'Confusion Alarm' are set to 'Disable'.
- PCI Auto Allocation:** 'Auto Allocation' is set to 'Disable'.
- RACH Optimization:** 'Root Sequence Index Optimization' is set to 'Disable'. 'Root Sequence Index Range Start' is set to '0' and 'Root Sequence Index Range End' is set to '837'. 'Save' and 'Cancel' buttons are at the bottom.

**Figure 71: REM / SON Setup**

6.2.3.14 ESON

From the tree menu, select ESON to move onto the ESON Setup page for configuring enable/disable of ESON function. There are three different functional sections related to ESON.

In PCI Configuration box, it provides PCI auto allocation function.

In MRO Configuration box, it provides Mobility Robustness Optimization function.

In MLB Configuration box, it provides Mobility Load Balance function.

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

- Smallcell
- Configuration
  - General
  - PKI
  - LTE
    - Basic
    - RF
    - S1AP
    - MR
    - LA
    - Neighbor Cell
    - UTRA Frequency
    - UTRA Neighbor Cell
    - GERAN Frequency
    - GERAN Neighbor Cell
    - DSCP Mapping
    - CSG
    - REM/SON
    - ESON**
- Administrations
- Information

### ESON Setup

You may configure ESON settings.

ESON Configuration	
Opmode	Enable ▼
CCS Host	54.219.185.120
CCS Port	2050
PCI Configuration	
Opmode	Disable ▼
MRO Configuration	
Opmode	Disable ▼
MLB Configuration	
Opmode	Disable ▼

**Figure 72: ESON Setup**

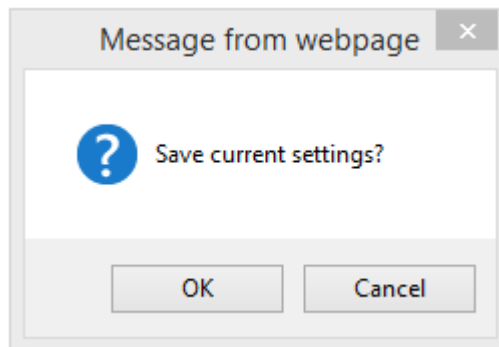
## 6.2.4 Administrations Menu

### 6.2.4.1 Settings

By clicking Administrations-Settings in the left tree menu, the Settings Management page will be displayed. If the save button is clicked, a pop-up window will be displayed for confirmation and the amended settings will be saved as shown in the Figure 73 and Figure 74. To close the window, click the OK button and the window will be removed.

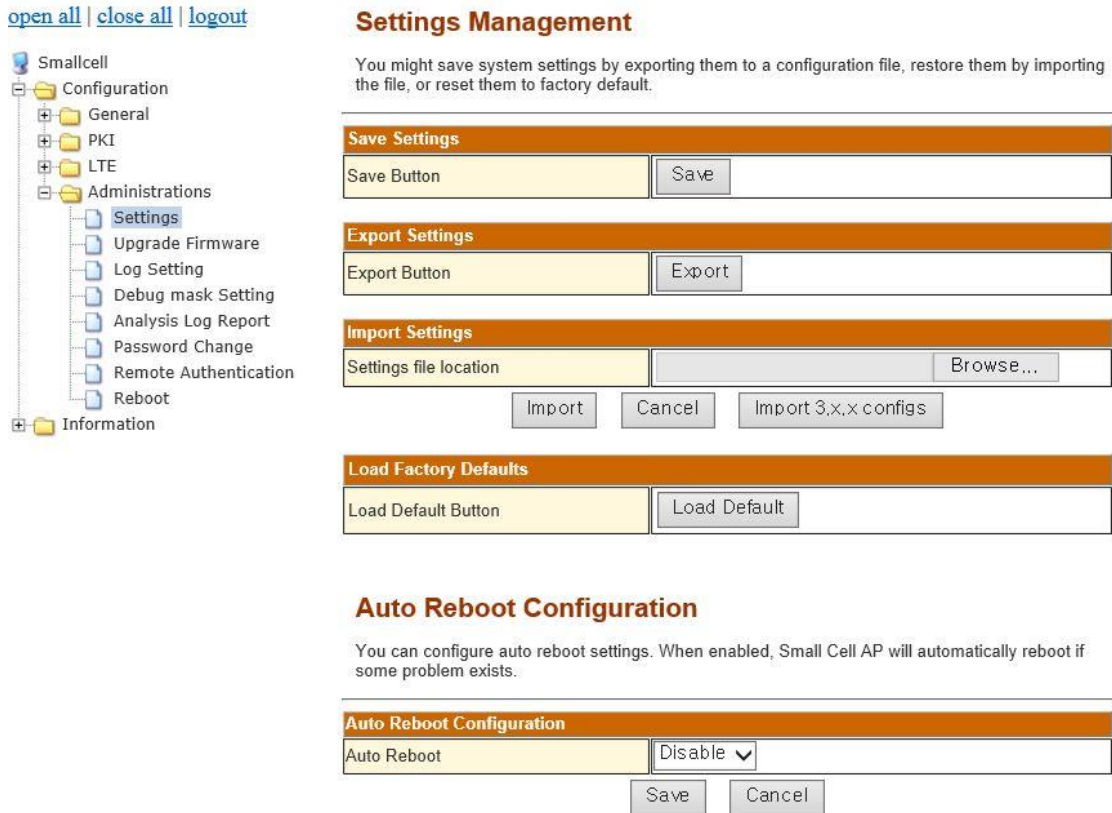
After changing the configuration and saving it, the amended setting will be saved in the Configuration file of ELT-622PI. The setting values will remain as what has been changed even after the reboot.

**Figure 73: Save Settings**



**Figure 74: Save Confirmation Window**

As shown in the Figure 75, the user can download the configuration file of ELT-622PI to its own PC.



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

**Settings Management**

You might save system settings by exporting them to a configuration file, restore them by importing the file, or reset them to factory default.

**Save Settings**

Save Button

**Export Settings**

Export Button

**Import Settings**

Settings file location

**Load Factory Defaults**

Load Default Button

**Auto Reboot Configuration**

You can configure auto reboot settings. When enabled, Small Cell AP will automatically reboot if some problem exists.

**Auto Reboot Configuration**

Auto Reboot

**Figure 75: Exporting Configuration File**

The exported configuration file can also be imported back into ELT-622PI.

Click the “Browse” button on the “Import Settings” box then select the configuration file as shown in Figure 76 and Figure 77. When the file is imported to ELT-622PI, the settings will be overwritten over the existing configuration file.

The ELT-622PI already has its configuration parameters overwritten when importing process is done. In the case clicking ‘SAVE’ button has no impact at all. When ELT-622PI is rebooted after importing a new configuration file, it starts operating with newly imported configuration file.

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

- Smallcell
  - Configuration
    - General
    - PKI
    - LTE
    - Administrations
      - Settings
      - Upgrade Firmware
      - Log Setting
      - Debug mask Setting
      - Analysis Log Report
      - Password Change
      - Remote Authentication
      - Reboot
  - Information

### Settings Management

You might save system settings by exporting them to a configuration file, restore them by importing the file, or reset them to factory default.

**Save Settings**

Save Button

**Export Settings**

Export Button

**Import Settings**

Settings file location

**Load Factory Defaults**

Load Default Button

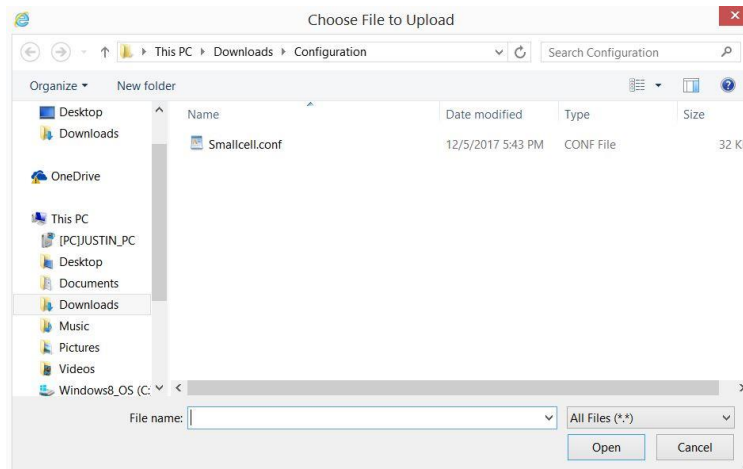
### Auto Reboot Configuration

You can configure auto reboot settings. When enabled, Small Cell AP will automatically reboot if some problem exists.

**Auto Reboot Configuration**

Auto Reboot

**Figure 76: Importing Configuration**

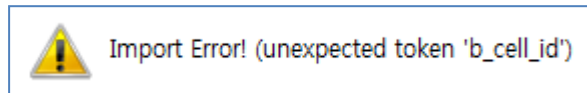


**Figure 77: Browsing Window for Importing Configuration File**



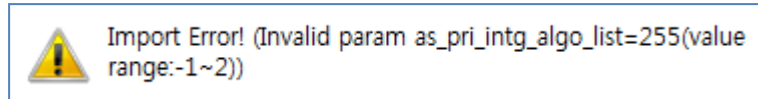
**After importing a Configuration file to ELT-622PI, it must be rebooted without “Save”. By clicking save, it will overwrite imported configuration file with the current setting in Web GUI.**

When any invalid parameter is imported in the Configuration File, the following error pop-up window will be displayed.



**Figure 78: Import Error Message1 (Example)**

When any out-of-range value is imported in the Configuration File, the following error pop-up window will be displayed.



**Figure 79: Import Error Message2 (Example)**

#### 6.2.4.2 Upgrade Firmware

From the tree menu, select Upgrade Firmware to move onto the Upgrade Firmware page as shown in Figure 80. Click Browse and select a ELT-622PI firmware file which has the .tar file extension. By clicking Apply button, the software will be downloaded to ELT-622PI and rebooted after the upgrade as shown in Figure 80 and Figure 81. Meanwhile, there will be upgrade and reboot notification on the screen as capture in Figure 82. After the reboot, Web GUI can be accessed again through IP address 10.0.0.1 or the new WAN IP address.



**Figure 80: Firmware Upgrade Menu**





**Figure 81: Screen after Selecting the New Firmware**

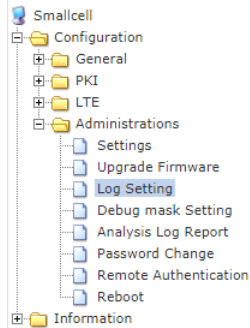


**Figure 82: Notification Screen during Firmware Upgrade Process**

#### 6.2.4.3 Log Setting

From the tree menu, select Log Setting to move onto the Log Setting page as shown in Figure 83. In this page, Log can be gathered by Log level and downloaded. The Log will be applied after clicking the Apply button.

Please refer to Table 18 for detailed input parameter information. Like other setting procedure, the changes must be saved.



### LOG Setting

You may configure LOG setting.  
[Console Log] / [Volatile Log] / [Non-Volatile Log]

Block	Mode	Console MASK	Volatile File MASK	Non-volatile Mask
ALL Block	--	--	Warning	--
Block	Mode	Console MASK	Volatile File MASK	Non-volatile Mask
Configuration	ON	Emergency	Warning	Emergency
Status	OFF	Warning	Warning	None
Statistics	OFF	Warning	Warning	None
Main Other Log	OFF	Warning	Warning	None
S1AP	OFF	Warning	Warning	None
LTE Modem Module	OFF	Warning	Warning	None
CWMP client	OFF	Warning	Warning	None
HTTP daemon	OFF	Warning	Warning	None
CLI daemon	OFF	Warning	Warning	None
SAS	OFF	Warning	Warning	None
ESON	OFF	Warning	Warning	None

Download Log Files		
Volatile Log File	<input type="button" value="Recent Log"/>	<input type="button" value="All Logs"/>
Non-volatile Log File	<input type="button" value="Recent NV Log"/>	<input type="button" value="All NV Logs"/>

Download Debug Logs	
Debug Log Files	<input type="button" value="Debug Logs"/>

**Figure 83: Log Setting**

Menu	Description
<b>Mode</b>	Log ON/OFF.
<b>Console Mask</b>	Select log level to be displayed on the console window of the locally connected control computer.
<b>Volatile File Mask</b>	Select log level for the volatile logs to be saved in the vmlog files.
<b>Non-volatile Mask</b>	Select log level for the non-volatile logs to be saved in the nvlog files.
<b>Volatile Log File</b>	Download vmlog files
<b>Non-Volatile Log File</b>	Download nvlog files

**Table 18: Description of Log Setting**

#### 6.2.4.4 Debug Mask Setting

From the tree menu, select Debug Mask Setting to move onto Debug mask Setting page as shown in Figure 84. In this page, Debug Mask Setting can be set by hexa code. After changing Debug Mask Setting and click Apply, the new configuration must be saved.

#### 6.2.4.5 Analysis Log Report

From the tree menu, select Analysis Log Report to move onto the Analysis Log Report page for configuring enable/disable of Analysis Log Report Configuration. After changing Analysis Log Report Configuration and click Apply, the new configuration must be saved.

The figure displays two screenshots from the EasyCell configuration interface. The top screenshot shows the 'eNodeB Debug Mask Settings' page, which includes a tree menu on the left and a table of settings on the right. The bottom screenshot shows the 'Analysis Log Report Configuration' page, also with a tree menu and a configuration table.

**eNodeB Debug Mask Settings**

Note : Do not change any field values.

Debug mask Settings	
cm	0x 0
egtpu	0x 0
enbapp	0x 8
lteclms	0x 0
ltemac	0x 0
ltepdcp	0x 0
ltephy	0x 0
lteremapp	0x 0
lterlc	0x 0
lterrc	0x 0
lterm	0x 0
mt	0x 0
s1ap	0x 0
sctp	0x 0
tucl	0x 0
x2ap	0x 0

Apply Cancel

**Analysis Log Report Configuration**

You may configure Analysis Log Report settings.

Analysis Log Report Configuration	
Mode	Enable ▾
IP address	112.216.115.62
User ID	jftp
Password	*****
Path	.
Timeout (Sec)	60

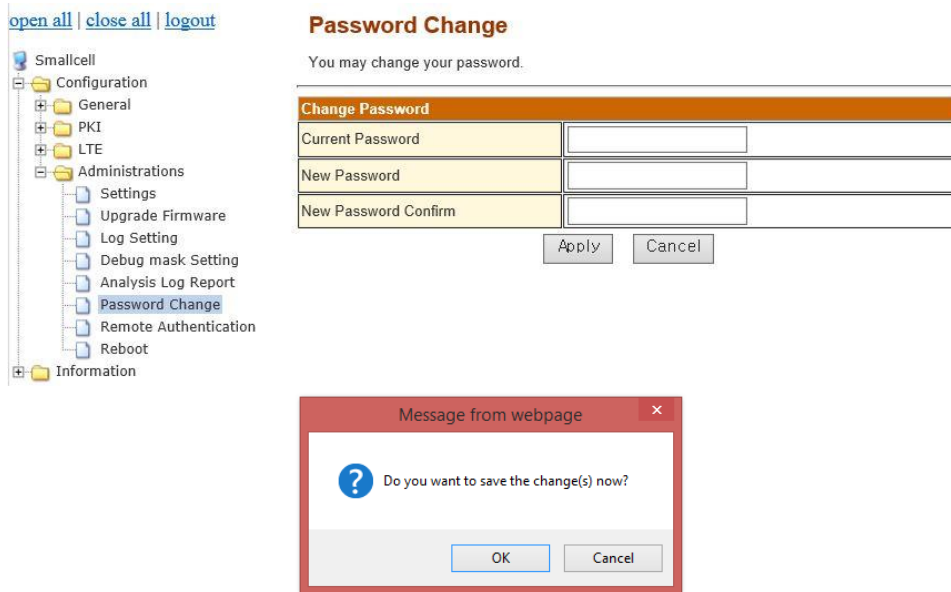
Apply Cancel

Figure 84: eNodeB Debug Mask Settings & Analysis Log Report

### 6.2.4.6 Password Change

From the tree menu, select Password Change to move onto the Password Change page as shown in Figure 85. It needs to Web GUI log in. Password should contain at least 3 types of Lowercase, Uppercase, Special character and Number.

This password format may require modification in accordance with the security policy of the service operator. The password change is only for the Web GUI of ELT-622PI and is not related to any other account to connect to ELT-622PI.



**Figure 85: Password Change**

### 6.2.4.7 Remote Authentication

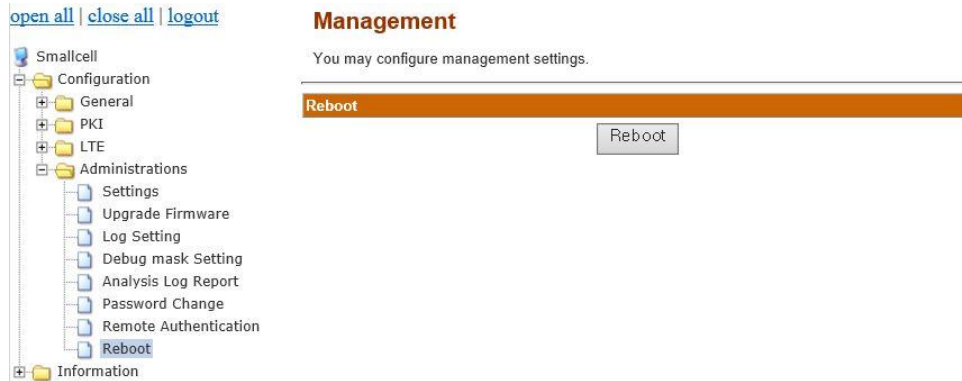
From the tree menu, select Remote Authentication to move onto the Remote Authentication page as shown in Figure 86. In this page, the remote authentication capability can be enabled or disabled. If the remote authentication is enabled, the remote users can log in to JL740 by the authentication performed by the authentication server. The 'server IP address', 'Port' and 'Shared secret' should be configured correctly in accordance with the remote RADIUS server configuration.



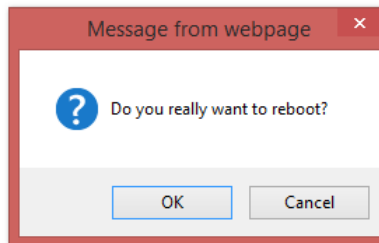
**Figure 86: Remote Authentication Configuration**

#### 6.2.4.8 Reboot

To reboot the system, select Administrations-Reboot in the tree menu. It will display the Reboot button as shown in Figure 87. Click the Reboot button as shown in Figure 88.



**Figure 87: Reboot Menu**



**Figure 88: Reboot Confirmation Window**

## 6.3 Information Menu

### 6.3.1 Update Period

From the tree menu, select Update Period to move onto the Update Period page as shown in Figure 89. In this page, Device info, CPU/Memory, Process, S/W.H/W info, DHCP info, GPS info, IEEE1588 info, and LTE UE list can change update period.

After changing the update period and click Apply, the new configuration must be saved.

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

- Smallcell
  - Configuration
    - General
    - PKI
    - LTE
    - Administrations
    - Information
      - Update Period**
      - Device Info
      - CPU/Memory
      - Process
      - Status
      - DHCPC Info
      - IEEE1588 Info
      - GPS Info
      - MME IP
      - RIP Info
      - SAS Info
      - LTE Statistics

### Information Update Period

You may configure information update period.

Update period for refreshing information	
Device information	Disable ▾
CPU and Memory	5 sec ▾
Processes information	Disable ▾
SW and HW Status	Disable ▾
DHCPC information	Disable ▾
GPS information	5 sec ▾
IEEE-1588 information	5 sec ▾
LTE UE list statistics	5 sec ▾
LTE RF information	6 sec ▾
LTE RIP information	5 sec ▾

**Figure 89: Update Period**

### 6.3.2 Device Info

From the tree menu, select Device Info to move onto the Device Information page as shown in Figure 90. In this page, MAC address, Model Name, Serial Number, SW version, Up-Time and Re-boot reason of the ELT-622PI are available.

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

Smallcell
Configuration
General
PKI
LTE
Administrations
Information
Update Period
<b>Device Info</b>
CPU/Memory
Process
Status
DHCP Info
IEEE1588 Info
GPS Info
MME IP
RIP Info
SAS Info
LTE Statistics

## Device Information

Display Current Device Information

Device Information	
MAC Address	64:A8:37:26:02:17
Model Name	ELT622
Product Class	TDD LTE indoor smallcell
Serial Number	6MT020188000005
SW Version	6.4.0
Additional SW Version	g50-lt621ct-9739
HW Version	V0.2
Additional HW Version	
PKG Information	Fri Apr 12 14:48:49 KST 2024
Enabled Options	GPS,
Up Time	0 Days 1 Hours 50 Minutes 54 Seconds
First IP Connection Time	

Firmware Version	
U-Boot Version	0.7.0.6
Sync Module Version	1.2

Re-boot Reason Information	
Re-boot Time	none
Previous Life Time	none
Re-boot Reason	Re-booted by SSH command or Lost power due to PoE/power cable disconnect

Figure 90: Device Information Menu

### 6.3.3 CPU/Memory

From the tree menu, select CPU/Memory to move onto the CPU/Memory Information page. It will show CPU/Memory Information as shown in Figure 91. In this page, CPU usage is calculated in average for three seconds itself. When CPU usage is displayed by update period, CPU average are displayed by cumulative average(previous CPU average and current CPU average). Memory usage is displayed by update period at moment.

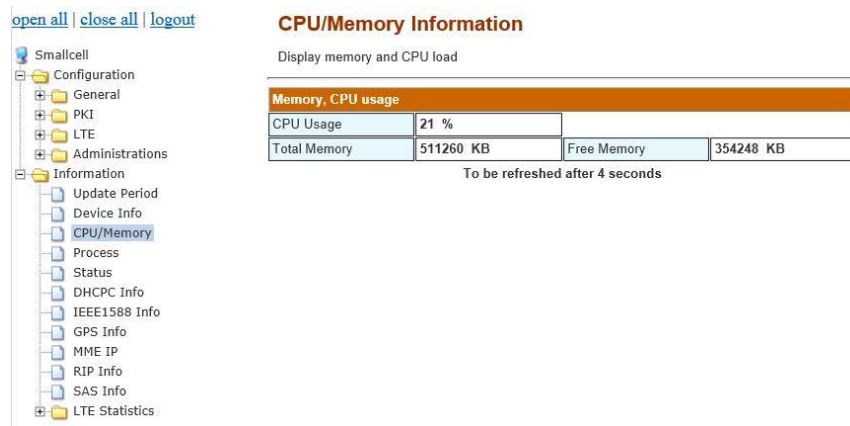


Figure 91: CPU/Memory Information

### 6.3.4 Process

From the tree menu, select Process to move onto the Process Information page. In this page, display process status in Figure 92.

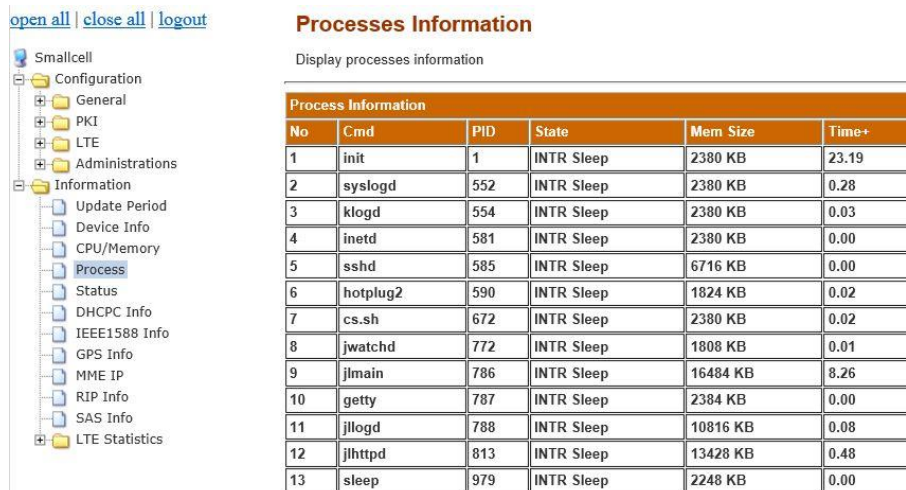


Figure 92: Process Information



### 6.3.5 Status

From the tree menu, select Status to move onto the Status page which has Software and Hardware status information. As shown in Figure 93, SW and HW status are separated and the alarm status of each category is available.

In the Alarm Status page, there is information on SW, HW and Link alarms and the number of triggered alarms as well as the latest alarm information as shown in Figure 94. The detailed description of the latest alarm will be displayed by clicking the Detail button. The Go to Status button will direct the user to the main Status page.

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

- Smallcell
- [-] Configuration
  - [-] General
  - [-] PKI
  - [-] LTE
  - [-] Administrations
  - [-] Information
    - Update Period
    - Device Info
    - CPU/Memory
    - Process
    - Status**
    - DHCP Info
    - IEEE1588 Info
    - GPS Info
    - MME IP
    - RIP Info
    - SAS Info
  - [-] LTE Statistics

## Status

Display status and alarm information

Group	Name	Status	Alarm Info		
			Code	Time	Detail
SW	MAIN	Running			
	ENODEB	Running			
	CWMP	Running			
	HTTPD	Running			
	SASC	Running			
HW	LTE PHY	Operating			
	GPS	Disabled			
	IEEE1588	Disabled			
	WAN Port	Connected 1Gbps Full duplex			
	MGMT Port	Connected 1Gbps Full duplex			
	RF-PWR	Normal 22dBm(main) 22dBm(mimo)			
Link	IP Addressing	OK			
	S1-MME	Up			
	S1-U	Active 1 UE(s)			
	SecGW	Disabled			
	HeMS	Disabled			
	SAS	Heartbeat Success			
TDD	CNM	Sync (EARFCN:56340, PCI:101)			
Resource	CPU	Normal 32%			
	Memory	Normal 79%			
	Disk	Normal 6%			

Initialization Status	
Current State	Initialization Done
Previous State	Run eNodeB

Alarm Occurrence History

**Figure 93: Software and Hardware Status Menu**

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

- Smallcell
  - Configuration
    - General
    - PKI
    - LTE
    - Administrations
  - Information
    - Update Period
    - Device Info
    - CPU/Memory
    - Process
    - Status**
    - DHCP Info
    - IEEE1588 Info
    - GPS Info
    - MME IP
    - RIP Info
    - SAS Info
    - LTE Statistics

## Status

Display status and alarm information

Group	Name	Status	Alarm Info		
			Code	Time	Detail
SW	MAIN	Running			
	ENODEB	Running			
	CWMP	Running			
	HTTPD	Running			
	SASC	Running			
HW	LTE PHY	Operating			
	GPS	Disabled			
	IEEE1588	Disabled			
	WAN Port	Connected 1Gbps Full duplex			
	MGMT Port	Connected 1Gbps Full duplex			
	RF-PWR	Normal 22dBm(main) 22dBm(mimo)			
Link	IP Addressing	OK			
	S1-MME	Up			
	S1-U	Active 1 UE(s)			
	SecGW	Disabled			
	HeMS	Disabled			
	SAS	Heartbeat Success			
TDD	CNM	Sync (EARFCN:56340, PCI:101)			
Resource	CPU	Normal 32%			
	Memory	Normal 79%			
	Disk	Normal 6%			

Initialization Status	
Current State	Initialization Done
Previous State	Run eNodeB

Alarm Occurrence History <input type="button" value="Show"/>			
Current Time : 2016-05-03 12:37:49 (events displayed=1)			
Code	Time	Severity	Detail
A3060	2016-05-03 02:29:18	Major	Debug Log Level Enabled(TM)

Figure 94: Alarm Occurrence History

### 6.3.6 DHCP Info

From the tree menu, select DHCP Info to move onto the DHCP client page. If DHCP server has been configured disable, DHCP client is displayed disable DHCP. It must be set DHCP mode in 6.2.1.2

open all | close all | logout

Smallcell

- Configuration
  - General
  - PKI
  - LTE
  - Administrations
- Information
  - Update Period
  - Device Info
  - CPU/Memory
  - Process
  - Status
  - DHCP Info**
  - IEEE1588 Info
  - GPS Info
  - MME IP
  - RIP Info
  - SAS Info
  - LTE Statistics

**DHCP Client Information**

Display DHCP Client Informaton at the DHCP mode

DHCP Client information	
DHCP Mode	Disable DHCP

Figure 95: DHCP Client Info

### 6.3.7 IEEE-1588 Info

From the tree menu, select IEEE-1588 Info to move onto the IEEE-1588 information page. In this page, display current status of IEEE-1588. It must be set 1588 mode in 6.2.1.6.

open all | close all | logout

Smallcell

- Configuration
  - General
  - PKI
  - LTE
  - Administrations
- Information
  - Update Period
  - Device Info
  - CPU/Memory
  - Process
  - Status
  - DHCP Info
  - IEEE1588 Info**
  - GPS Info
  - MME IP
  - RIP Info
  - SAS Info
  - LTE Statistics

**IEEE-1588 Information**

Display current IEEE-1588 Information

IEEE-1588 status	
Connection	Not connected
LOCK status	UNLOCKED
Running time	0
DAC	0
Default DAC	0
Downlink Time Offset (ns)	0
One-way delay	0
Local time offset	00:00
Local time	0-00-00 00:00:00

To be refreshed after 1 seconds

Figure 96: IEEE-1588 Info

### 6.3.8 GPS Info

From the tree menu, select GPS Info to move onto the GPS information page. In this page, display current status of GPS. It must be set GPS mode in 6.2.1.6.

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

- Smallcell
- Configuration
  - General
  - PKI
  - LTE
  - Administrations
- Information
  - Update Period
  - Device Info
  - CPU/Memory
  - Process
  - Status
  - DHCPC Info
  - IEEE1588 Info
  - GPS Info**
  - MME IP
  - RIP Info
  - SAS Info
- LTE Statistics

#### GPS Information

Display current GPS Information

GPS Normal Information	
Lock Status	GPS WARNING
Running time	0
Visible SAT num	0
Tracking SAT num	0
Time tick	0
Latitude	
Longitude	
Elevation	0 meters
Initial Waiting Period	0
DAC	0
Downlink Time Offset (ns)	0
Leap second	0
Antenna delay	0
Local time offset	00:00
Local time	0-00-00 00:00:00

To be refreshed after 2 seconds

**Figure 97: GPS Info**

### 6.3.9 Resolved MME IP

From the tree menu, select Resolved MME IP to move onto the Resolved MME IP Information page. In this page, it displays the IP address of the MME of which FQDN has been resolved as shown in Figure 98.

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

- Smallcell
- Configuration
  - General
  - PKI
  - LTE
  - Administrations
- Information
  - Update Period
  - Device Info
  - CPU/Memory
  - Process
  - Status
  - DHCPC Info
  - IEEE1588 Info
  - GPS Info
  - MME IP**
  - RIP Info
  - SAS Info
- LTE Statistics

#### MME IP Information

Display current resolved IP lists of MME

No	Registered MME FQDN(or IP)	IP	Status
1	10.1.35.31	10.1.35.31	DOWN

**Figure 98: Resolved MME IP**

### 6.3.10 RIP Info

From the tree menu, select RIP Info to move onto the LTE RIP Information page. In this page, it displays the current status of Rx Interference Power as shown in Figure 99.

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

- Smallcell
  - Configuration
    - General
    - PKI
    - LTE
    - Administrations
  - Information
    - Update Period
    - Device Info
    - CPU/Memory
    - Process
    - Status
    - DHCPC Info
    - IEEE1588 Info
    - GPS Info
    - MME IP
    - RIP Info**
    - SAS Info
  - LTE Statistics

#### LTE RIP Information

Display Rx Interference Power Information.

LTE RIP Information	
Avg RIP per RB over channel bandwidth (0RBs)	0.0dBm

To be refreshed after 0 seconds

**Figure 99: LTE RIP Information**

### 6.3.11 SAS Info

From the tree menu, select SAS Info to move onto the SAS Information page. In this page, it displays the current SAS Information as shown in Figure 100.

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

- Smallcell
  - Configuration
  - Information
    - Update Period
    - Device Info
    - CPU/Memory
    - Process
    - Status
    - DHCPC Info
    - IEEE1588 Info
    - GPS Info
    - MME IP
    - RIP Info
    - SAS Info**
  - LTE Statistics

#### SAS Information

Display current SAS Information

SAS Information	
Status	Uninitialized
CBSD ID	
Grant Id	
URL	
Registered Location(Lat,Long)	0.000000, 0.000000
Max EIRP (dBm/MHz)	0.000
Freq Range High (Khz)	0
Freq Range Low (Khz)	0
Heartbeat Interval(sec)	0
Grant Expire Time(UTC)	
Last Response Time(UTC)	
Current Time(UTC)	2017-05-24 03:54:57

To be refreshed after 2 seconds

**Figure 100: SAS Information**

## 6.3.12 LTE Statistics Menu

### 6.3.12.1 UE List

From the tree menu, select LTE Statistics-UE List to move onto the LTE UE List page. In this page, it displays current LTE UE list at update moment as shown in Figure 101.



The screenshot shows a web interface for 'Smallcell' management. On the left is a tree menu with categories like Configuration, Information, and LTE Statistics. The 'UE List' option under 'LTE Statistics' is selected. On the right, the 'LTE UE List' page displays a table with the following data:

No	Cell ID	GUTI	C-RNTI	CSG-TYPE	UE-STATE	MME-IP
1	1	0	61	non-csg	mo-traffic	10.1.35.31

Below the table, it states 'To be refreshed after 1 seconds'.

**Figure 101: UE List**

## 7 FCC Statement

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

If the distance from the product to the human body is greater than 20cm, the following warning is required (this requirement is not required for micro-power SRD devices).

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

---

## Appendix 1. Abbreviation

3GPP	3rd Generation Partnership Project
ANR	Automatic Neighbor Relation
ARQ	Automatic Repeat Request
BPF	Band Pass Filter
CMAS	Commercial Mobile Alert System
CSR	Certificate Signing Request
DHCP	Dynamic Host Configuration Protocol
DL	Downlink
DNS	Domain Name Server
DSCP	Differentiated Services Code Point
EPC	Evolved Packet Core
E-RAB	E-UTRAN Radio Access Bearer
ETWS	Earthquake and Tsunami Warning System
E-UTRAN	Evolved UTRAN
FTP	File Transfer Protocol
GPS	Global Positioning System
GTP	GPRS Tunneling Protocol
GTP-U	GTP-User
GW	Gateway
HARQ	Hybrid Automatic Repeat Request
HeMS	HeNB Management System
HeNB	Home enhanced Node B
HO	Handover
HSS	Home Subscriber Server
HTTP	Hyper Text Transfer Protocol
ICMP	Internet Control Message Protocol
IP	Internet Protocol
LNA	Low Noise Amplifier
LTE	Long Term Evolution
MAC	Medium Access Control
MCC	Mobile Country Code
MCS	Modulation Coding Scheme
MIB	Master Information Block
MIMO	Multiple-Input Multiple-Output
MME	Mobility Management Entity
MNC	Mobile Network Code
OAM	Operation and Maintenance
PAM	Power Amplifier Module
PCI	Physical Cell Identity
PDCP	Packet Data Convergence Protocol
PDN	Packet Data Network
P-GW	PDN Gateway
PKI	Public Key Infrastructure
PLMN	Public Land Mobile Network
PoE	Power over Ethernet

PTP	Precision Time Protocol
PWS	Public Warning System
QAM	Quadrature Amplitude Modulation
QoS	Quality of Service
REM	Radio Environment Monitoring
RF	Radio Frequency
RLC	Radio Link Control
SCTP	Stream Control Transmission Protocol
S-GW	Serving Gateway
SIB	System Information Block
SMS	Short Message Service
SON	Self Organizing Network
TA	Tracking Area
TAC	Tracking Area Code
TDD	Time Division Duplex
UE	User Equipment
UL	Uplink
UTRAN	UMTS Terrestrial Radio Access Network
VLAN	Virtual Local Area Network