

# **SLC-120xOGA SERIES ENGINEER GUIDE**

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**SEOWON INTECH**

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**V 1.1.3**

**2019.01.25**

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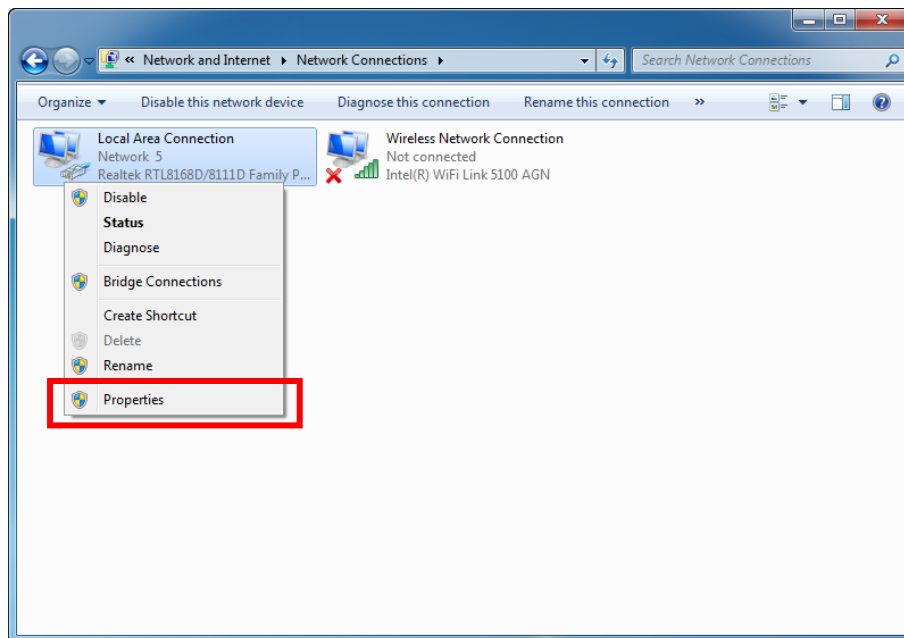
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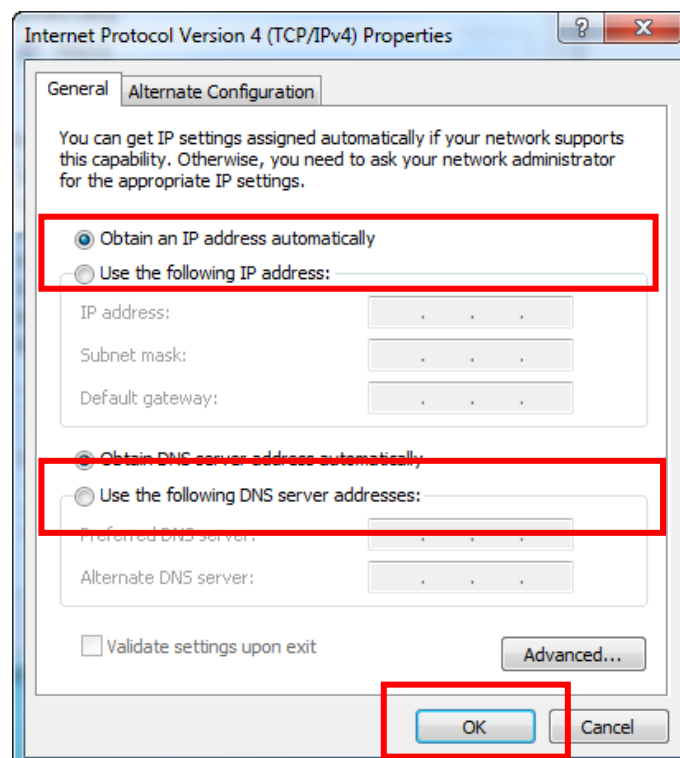
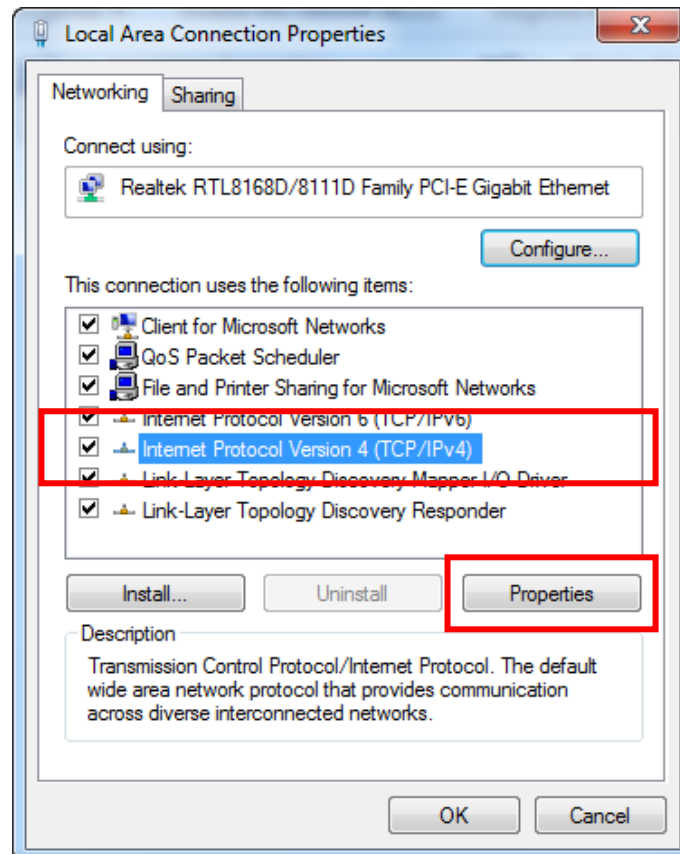
# 1. Introduction to the Product

## 1.1. PC Configuration (Windows 7)

Most computers already have the TCP/IP configuration enabled. For your computer to support CPE, please verify that the IP address and DNS settings are automatically generated in the Local Area connection of your Internet Protocol (TCP/IP) properties.

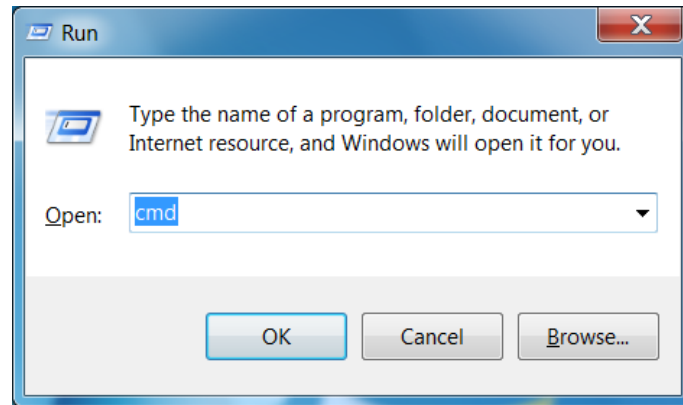
- In a Windows environment :
- Click “**Start**” button >> Click “**Control Panel**”>> Click “**Network and Internet Connection**”>> Click “**Network Connection**”>> Right-click “**Local Area Connection**”and Select “**Properties**”>> Select “**Internet Protocol 4(TCP/IPv4)**” and click “**Properties**”>> Select “**obtain an IP address automatically**” and “**obtain DNS server address automatically**”>> Click “**OK**”.





## 1.2. How To Check your IP address

Open the Command Prompt window by clicking the “**Start**” button and selecting “**Run**”. Enter “cmd”, and click the “OK” button.



<Run cmd>

- When the Command Prompt window opens , enter the “ipconfig” command to verify the IP address , Subnet mask , and Gateway , which are automatically assigned to PC

**[Note]** PCs connected to Device will receive own assigned IP address.

```
C:\>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.1.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

C:\>_
```

<Verify IP address>

```
C:\Users\Steve_Kim>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=1ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64
Reply from 192.168.1.1: bytes=32 time=8ms TTL=64
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms
```

If the host can reach the device using the ping command, the device has successfully attached.

**[Note]** If an IP address is not assigned, check the following, and then restart the PC and check whether an IP address is assigned.

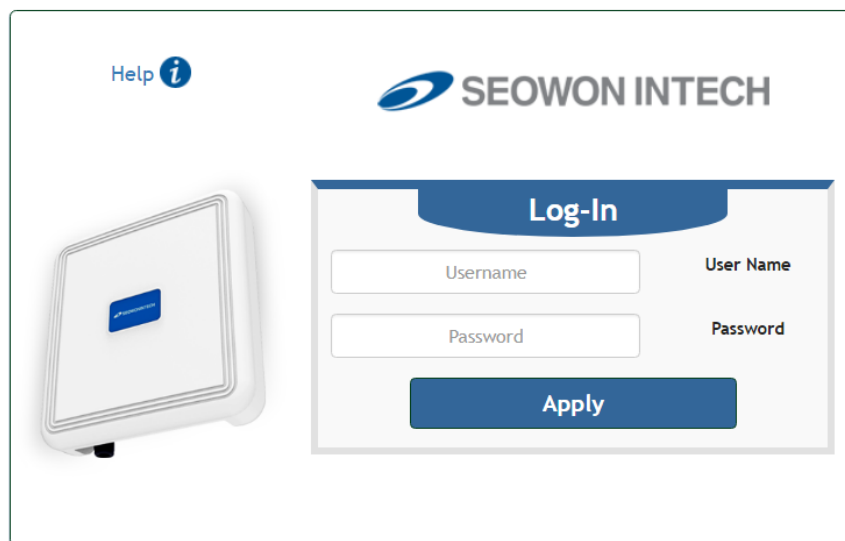
- ✓ LAN cable connection between PC and Device.
- ✓ Check TCP/IP setup details

## 2. Build-in Web Server Access

The Web Browser allows you to manage the Device and to view.

In the Address Bar:

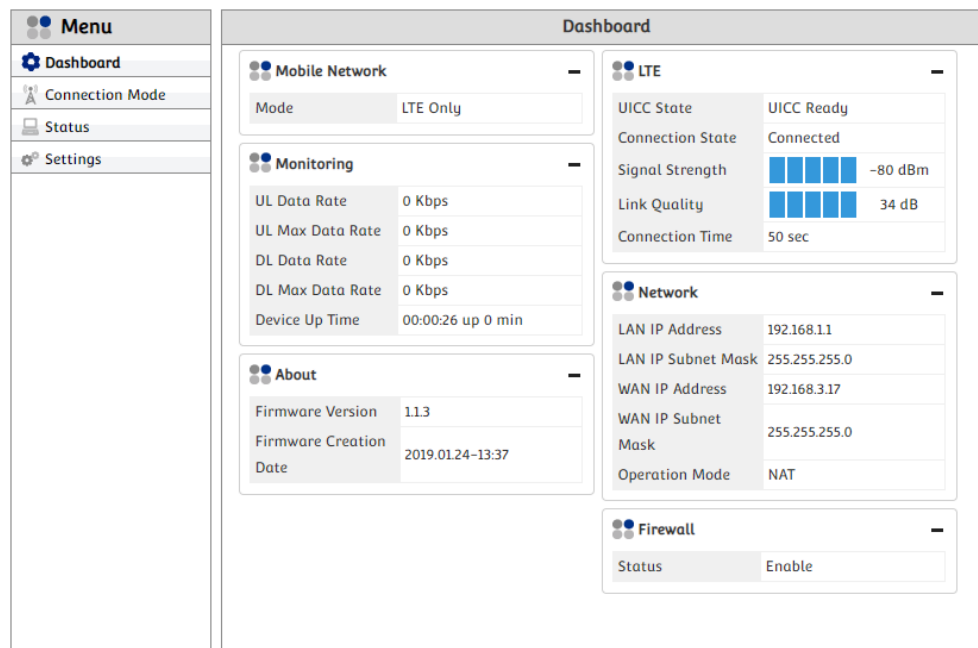
- Type <http://192.168.1.1> and press ENTER to access the login screen.
- When the login screen appears, it prompts you for a password.
- Default engineer ID and password are “**system / system**”
- You can change the password after logged in (Passwords are case-sensitive).



**[Note]** The Web Interface can be accessed by entering <http://192.168.1.1> in the Address Bar, regardless of the network connection status. When there is no input for 1 hour after your login to the Web Interface, you will be automatically logged out.

## 3. Setup on the web page

### 3.1. Dashboard



“Dashboard” shows overall status of CPE’s functionality. A user can see LTE connection status, transferred Data rate, LAN and WAN IP address assigned, and Firmware version information at a glance.

- Mobile Network
  - ✓ Mode : Currently supported Radio Access Technology
  - ✓ Operator : Manufacturer of CPE
- LTE
  - ✓ UICC state : Status of USIM card inserted
  - ✓ Connection State : Connection status on LTE network
  - ✓ PDN Type : IPv4 / Plv6
- Monitoring
  - ✓ UL Data Rate : Current Uplink Data Rate
  - ✓ UL Max Data Rate : Maximum Uplink Data Rate reached
  - ✓ DL Data Rate : Current Downlink Data Rate
  - ✓ DL Max Data Rate : Maximum Downlink Data Rate reached
  - ✓ Device Up Time : Time elapsed after CPE turned on
- Network
  - ✓ LAN IP Address : IP address assigned by LAN DHCP Server
  - ✓ LAN IP Subnet Mask : Subnet Mask address assigned by LAN DHCP Server
  - ✓ WAN IP Address : WAN (LTE) IP address assigned to CPE

- ✓ WAN IP Subnet Mask : WAN (LTE) Subnet Mask address assigned to CPE
- ✓ Operation Mode : Switch mode status. NAT / Bridge
- About
  - ✓ Firmware Version : Version of current firmware
  - ✓ Firmware Creation Date : The time when Firmware made
- Firewall
  - ✓ Status : Enable / Disable status of Firewall

## 3.2. Connection Mode

| Menu            |  |
|-----------------|--|
| Dashboard       |  |
| Connection Mode |  |
| Status          |  |
| Settings        |  |

### Connection Mode

**Operation**  
Auto-connect: Auto ▼ Apply

**Connect Manager**  
Status: Connected  
Action: Connect Disconnect

- Operation
  - ✓ Auto-connect : A user can select LTE registration time after CPE's boot-up. "Auto" means CPE tries to attach LTE network just after boot-up. "Manual" means CPE will not try to attach LTE network until a user clicks "Connect" in the "Connect Manager" menu.
- Connect Manager
  - ✓ A user can "CONNECT" or "DISCONNECT" LTE connectivity by this menu.

### 3.3. Status

#### 3.3.1. LTE

| Menu     | LTE Status      |                 |            |                 |
|----------|-----------------|-----------------|------------|-----------------|
|          | LTE Information |                 |            |                 |
|          | LTE Status      |                 |            |                 |
|          | LTE Statistics  |                 |            |                 |
| LTE      | LTE Information |                 |            |                 |
|          | FW Ver          | 0.3.2.21        | CM Ver     | 3.7.18.2        |
|          | SDK Ver         | 0.64.13.0       | Driver Ver | 1.0.2.2         |
|          | IMEI            | 352470060006193 | IMSI       | 001010000000023 |
| Settings |                 |                 |            |                 |
|          |                 |                 |            |                 |
|          |                 |                 |            |                 |
|          |                 |                 |            |                 |

This table shows LTE software version information, device ID and USIM ID.

- FW Ver : Modem firmware version
- CM Ver : LTE Connection Manager version
- SDK Ver : SDK version
- Driver Ver : LTE Driver version
- IMEI : International Mobile Equipment Identity
- IMSI : International Mobile Subscriber Identity of inserted USIM

| Menu               |  | LTE Status               |  |  |  |
|--------------------|--|--------------------------|--|--|--|
| Dashboard          |  | LTE Information          |  |  |  |
| Connection Mode    |  | LTE Status               |  |  |  |
| Status             |  | LTE Statistics           |  |  |  |
| LTE                |  | LTE Status               |  |  |  |
| Network            |  | UICC State               |  |  |  |
| Device Details     |  | UICC Ready               |  |  |  |
| Device Performance |  | Connection               |  |  |  |
| Settings           |  | Connected                |  |  |  |
|                    |  | Band                     |  |  |  |
|                    |  | 42                       |  |  |  |
|                    |  | APN Name                 |  |  |  |
|                    |  | IP v4 Address            |  |  |  |
|                    |  | 192.168.3.17             |  |  |  |
|                    |  | PDN Type                 |  |  |  |
|                    |  | IP v6 Address            |  |  |  |
|                    |  | 2600:0:0:0:0:05:345      |  |  |  |
|                    |  | PLMN Search              |  |  |  |
|                    |  | Success                  |  |  |  |
|                    |  | PLMN Selected            |  |  |  |
|                    |  | 00101                    |  |  |  |
|                    |  | Cell Global ID           |  |  |  |
|                    |  | 0xdcd8602 (231572994)    |  |  |  |
|                    |  | eNodeB ID                |  |  |  |
|                    |  | 0xdcd86 (904582)         |  |  |  |
|                    |  | Current UL T/P           |  |  |  |
|                    |  | 0 Kbps                   |  |  |  |
|                    |  | Service Cell State       |  |  |  |
|                    |  | RRC CONNECTED            |  |  |  |
|                    |  | CQI                      |  |  |  |
|                    |  | 15                       |  |  |  |
|                    |  | Transmission Mode        |  |  |  |
|                    |  | TM [4]                   |  |  |  |
|                    |  | Current CA               |  |  |  |
|                    |  | 2 CA                     |  |  |  |
|                    |  | Auto Refresh             |  |  |  |
|                    |  | <input type="checkbox"/> |  |  |  |
|                    |  | Current Uplink CA        |  |  |  |
|                    |  | 2 CA                     |  |  |  |
|                    |  | Primary Cell             |  |  |  |
|                    |  | Physical CELL ID         |  |  |  |
|                    |  | 0x3c (60)                |  |  |  |
|                    |  | TX power                 |  |  |  |
|                    |  | -34.8 dB                 |  |  |  |
|                    |  | RSSI                     |  |  |  |
|                    |  | -57.4/-54.1 dBm          |  |  |  |
|                    |  | RSRP                     |  |  |  |
|                    |  | -83.3/-80.1 dBm          |  |  |  |

All LTE information like Radio Frequency, Throughput, IP address, and Connection status are displayed in this page. Also, if the device is connected by multiple antennas, "Secondary Cell" information will be displayed.

- UICC State : Universal Integrated Circuit Card, status of inserted USIM card
- Connection : LTE connection status (Connected / Not Connected)
- PDN Type : Connected Packet Data Network type
- Band : Camped LTE Frequency Band
- IP v4 Address : IP v4 Address from network
- IP v6 Address: IP v6 Address from network
- PLMN Search: Searching or Registration status of Public Land Mobile Network
- MCC : Mobile Country Code
- PLMN Selected : Network Identifier of camped network
- MNC : Mobile Network Code
- Cell Global ID : E-UTRAN Cell Identifier. eNodeB ID + Cell ID
- EMM state : EPS Mobility Management (One of NAS function) status
- eNodeB ID : eNodB ID
- Cell ID : Cell ID
- UL EARFCN : Uplink Evolved-UTRA Absolute Radio Frequency Channel Number
- UL Freq. : Uplink Frequency that matched to UL EARFCN [MHz]
- Current UL T/P : Current Uplink Throughput [Kbps]
- Current DL T/P : Current Downlink Throughput [Kbps]

- UL MCS : Modulation and Coding Scheme used in Uplink  
20(1) : MCS index (The number of allocated Resource Block)
- TX power : Transmission Power [dB]
- Service Cell state : RRC (Radio Resource Control) state
- CQI : Channel Quality Indicator
- Transfer Mode : Transmission Mode
- Auto Refresh : If checked, all LTE Status values are renewed by every second
- Current CA : Carrier Aggregation Status. Non-CA / 2CA / 4CA



| Menu               | LTE Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
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| Dashboard          | LTE Information    LTE Status <b>LTE Statistics</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Connection Mode    | <b>LTE Statistics</b><br>Rx packets    1    Tx packets    632<br>Rx bytes    88    Tx bytes    44354                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Status             | <b>CQI Statistics</b><br><b>APERIODIC</b><br><table> <tr> <th>Mode</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th></tr> <tr> <td>MODE1-2</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> <tr> <td>MODE2-0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> <tr> <td>MODE2-2</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> <tr> <td>MODE3-0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> <tr> <td>MODE3-1</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> </table> <b>PERIODIC</b><br><table> <tr> <th>Mode</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th></tr> <tr> <td>MODE1-0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> <tr> <td>MODE1-1</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>5,5</td></tr> <tr> <td>MODE2-0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> <tr> <td>MODE2-1</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td><td>0,0</td></tr> </table> |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Mode | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | MODE1-2 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | MODE2-0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | MODE2-2 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | MODE3-0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | MODE3-1 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | Mode | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | MODE1-0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | MODE1-1 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5,5 | MODE2-0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | MODE2-1 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |
| Mode               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE1-2            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE2-0            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE2-2            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE3-0            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE3-1            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Mode               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE1-0            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE1-1            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 5,5 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE2-0            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| MODE2-1            | 0,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| LTE                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Network            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Device Details     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Device Performance |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Settings           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |         |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

You can see how many Packets and Bytes are exchanged through LTE network from power-on of the device.

Also, CQI (Channel Quality Indicator) Report Statistics is displayed as tables, arranged by CQI Index and Transmission Mode, and by Aperiodic and Periodic reporting.

- Rx Packets : The number of received packets
- Tx Packets : The number of sent packets
- Rx Bytes : The size of received Bytes
- Tx Bytes : The size of sent Bytes
- CQI Index : 1 – 16
- MODE1-2 : Transmission Mode that is decided by the combination of CQI and PMI (Precoding Matrix Indicator)
- APERIODIC : CQI is transmitted periodically with a certain interval specified by higher layer message
- PERIODIC : CQI is transmitted by a special trigger
- CW0,CW1 : CQI reporting counts through Code Word 0, Code Word 1

### 3.3.2. Network

Menu

Dashboard

Connection Mode

Status

LTE

Network

Device Details

Device Performance

Settings

Network Information

WAN

LAN

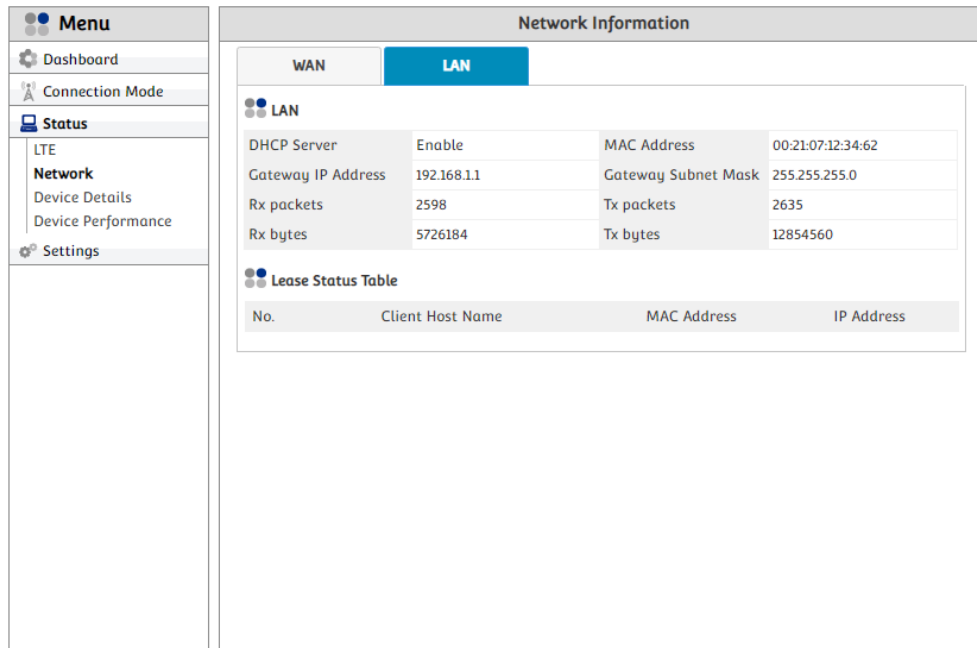
WAN

|                        |               |                    |               |
|------------------------|---------------|--------------------|---------------|
| WAN IP Address         | 192.168.3.17  | WAN IP Subnet Mask | 255.255.255.0 |
| WAN IP Default Gateway | 192.168.3.238 |                    |               |
| Primary DNS            | 168.126.63.1  | Secondary DNS      | 168.126.63.2  |

This page shows IP address of WAN(LTE network) side.

- WAN

- ✓ WAN IP Address : WAN(LTE) IP address assigned to CPE
- ✓ WAN IP Subnet Mask : WAN(LTE) Subnet Mask address assigned to CPE
- ✓ WAN IP Default Gateway : WAN(LTE) Default Gateway address assigned to CPE  
(All packets (except its destination IP address is inside LTE network) are delivered to the Default Gateway)
- ✓ Primary DNS : First DNS address assigned to CPE
- ✓ Secondary DNS : Second DNS address assigned to CPE



LAN(Ethernet)Information is displayed in the menu.

- LAN

- ✓ DHCP Server : LAN DHCP Server status (Enable / Disable)
- ✓ MAC Address : LAN(Ethernet) MAC (Media Access Control) address
- ✓ Gateway IP Address : Gateway IP address assigned by LAN DHCP Server
- ✓ Gateway Subnet Mask : Subnet Mask address assigned by LAN DHCP Server
- ✓ Rx Packets : The number of all packets received through LAN connection
- ✓ Tx Packets : The number of all packets sent through LAN connection
- ✓ Rx bytes : Sum of all packets received through LAN connection [bytes]
- ✓ Tx bytes : Sum of all packets sent through LAN connection [bytes]
- ✓ Lease Status Table : The list of all the device which are connected by LAN and assigned IP, Subnet Mask, and Default Gateway Address by CPE

### 3.3.3. Device Details

| Menu               | Device Details |  |  |  |
|--------------------|----------------|--|--|--|
| Dashboard          |                |  |  |  |
| Connection Mode    |                |  |  |  |
| Status             |                |  |  |  |
| LTE                |                |  |  |  |
| Network            |                |  |  |  |
| Device Details     |                |  |  |  |
| Device Performance |                |  |  |  |
| Settings           |                |  |  |  |

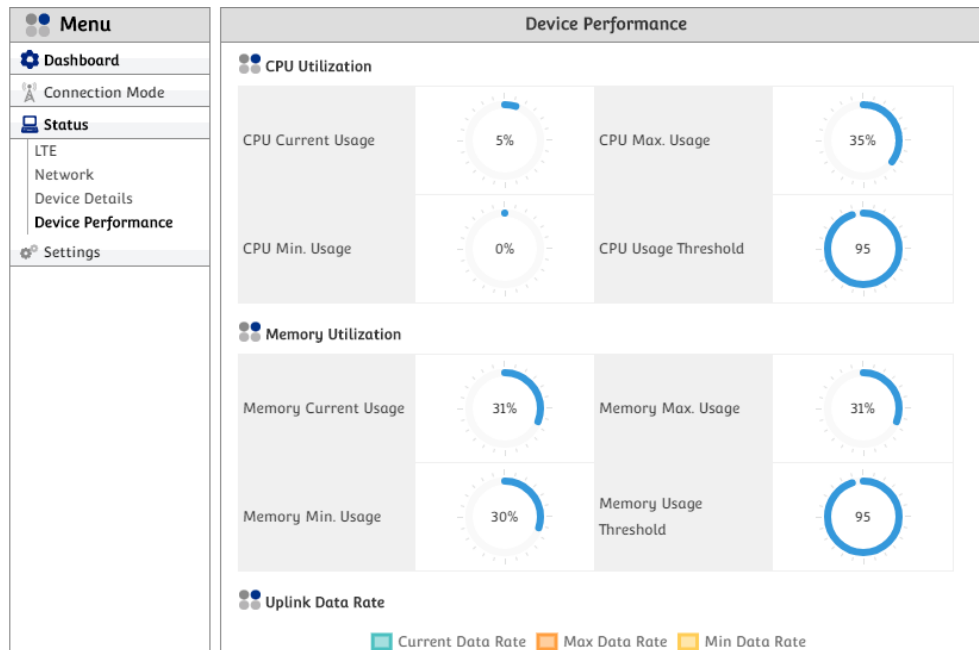
  

| Device Details       |                        |                        |                                                          |
|----------------------|------------------------|------------------------|----------------------------------------------------------|
| Device Time          |                        |                        |                                                          |
| Current Local Time   | 2015-01-01 00:21:52    | Time Server            | ntp1.caLnet                                              |
| Synchronize With PC  | Out of sync            | Time Zone              | Pacific Time (US and Canada)                             |
| Daylight Saving Time | Enable                 |                        |                                                          |
| Device Information   |                        |                        |                                                          |
| ODM                  | Seowonintech co., LTD. | Product Name           | SLC-120T42OGA                                            |
| OUI                  | 00:21:07               | Serial Number          | SEOWONXX130T03-0000001                                   |
| Firmware Version     | 1.1.3                  | Firmware Creation Date | 2019.01.24-13:37                                         |
| Hardware Version     | 1.0                    | Last reboot cause      | Abnormal Reboot by Electrical Power Off or Defect Device |

This page shows the device and time information.

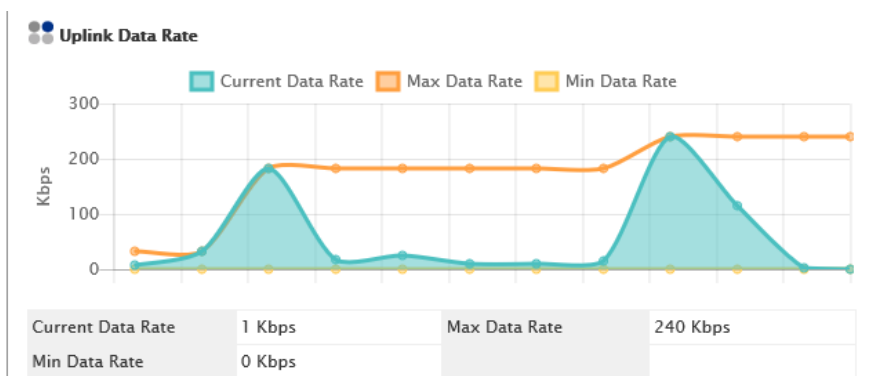
- Current Local Time : Current time where CPE is located
- Time Server : Server address that CPE synchronize its time
- Synchronize With PC : Time synchronization status between connected PC and CPE
- Time Zone : Standard time of CPE
- Daylight Saving Time : Daylight Saving Time (Summer Time) status (Enable / Disable)
- ODM : Original Development Manufacturing of CPE
- Product Name : Model name
- OUI : Organizationally Unique Identifier. Uniquely identifies a vendor, manufacturer
- Serial Number : Uniquely assigned to every CPE by manufacturer
- Firmware Version : Version of current firmware
- Firmware Creation Data : The time when Firmware made
- Hardware Version : Hardware Version.

### 3.3.4. Device Performance

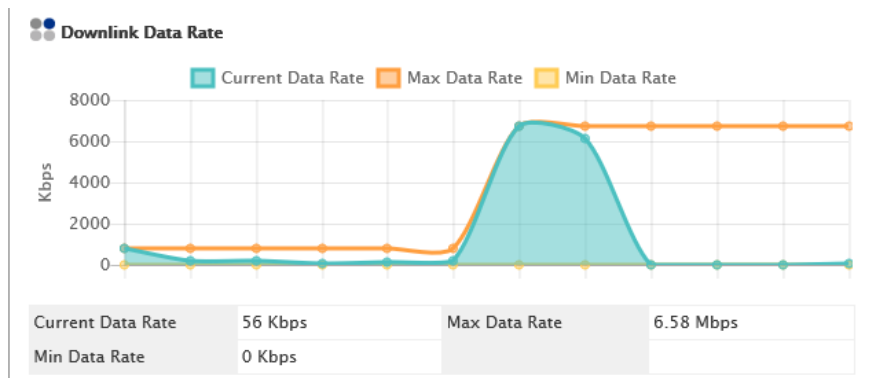


Several statistics relative to Device performance, is shown.

- CPU Current Usage : CPU currently used
- CPU Max. Usage : CPU Maximum used
- CPU Min. Usage : CPU Minimum used
- CPU Usage Threshold : Maximum CPU can be used
- Memory Current Usage : Memory currently used
- Memory Max. Usage : Memory Maximum used
- Memory Min. Usage : Memory Minimum used
- Memory Usage Threshold : Maximum Memory can be used



- Current Data Rate : Current Uplink Data Rate
- Max Data Rate : Maximum Uplink Data Rate reached
- Min Date Rate : Minimum Uplink Data Rate reached



- Current Data Rate : Current Downlink Data Rate
- Max Data Rate : Maximum Downlink Data Rate reached
- Min Date Rate : Minimum Downlink Data Rate reached

**System Information**

|                |                    |
|----------------|--------------------|
| Firewall       | Enable             |
| Device Up Time | 00:41:49 up 42 min |

- Firewall : Firewall status (Enable / Disable)
- Device Up Time : Time elapsed after CPE turned on

## 3.4. Settings

### 3.4.1. LTE

#### 3.4.1.1. Cell Selection

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings**
  - LTE**
    - Cell Selection**
    - Cell Lock
    - PCI Cell Lock
    - SIM Management
    - Default PDN
    - Multiple PDN
    - Internet MTU
    - IPv6 Settings
  - Network
  - Firewall
  - User Management
  - Firmware Management
  - Monitoring

**Cell Selection**

**Band Selection**

Mode: Full Band

Status: 42,43,48

Band Selection: ☒ Band-42 ☒ Band-43 ☒ Band-48

PLMN Selection: Auto

Apply

**Cell Selection Option**

Power Scan Option: ☒ First Detected Cell ☐ Strongest Cell(Power On) ☐ Strongest Cell(Always)

Apply

Cell Selection provides two main functions: Band Selection and Cell Selection Option.

By default setting in Band Selection, the device will search full LTE band supported and select PLMN automatically. With this menu, you can specify LTE band and PLMN that are needed as per uses.

**Cell Selection**

**Band Selection**

Mode: Full Band

Status: 42,43,48

Band Selection: ☒ Band-42 ☒ Band-43 ☒ Band-48

PLMN Selection: Manual

Apply

**Manual PLMN selection**

Current MCC/MNC:  Clear

Search

**Cell Selection**

**Band Selection**

Mode: Frequency

Status: 42,43,48

Band Selection: ☒ Band-42 ☒ Band-43 ☒ Band-48

**Channel Plan**

Count: 1

Band: 42 EARFCN:  Freq.: MHz

Apply

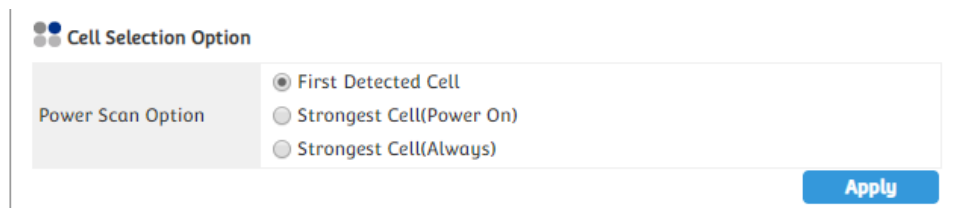
**Warning:** If click the 'Search' button then it will be disconnected. Please click the 'Apply' after set MCC/MNC and reboot or enter the 'Connection Mode' and manual connect.

- Select “Settings” → “LTE” → “Cell Selection” from the menu.

- You can change the mode “Full Band” or “Frequency” and set EARFCN manually.
- You can see the status of band and change the band.
- You can change the “PLMN selection”.
- You can set MCC and MNC manually if you select “Manual” in “PLMN Selection” list.
- Finish setup by clicking the “Apply” button.

By default setting in Cell Selection Option, in the idle mode, the cell reselection operates according to 3GPP standard 36.304. When the idle state is changed in the connected state, the cell selection preferentially selects the Serving Cell according to 3GPP standard 36.300.

The criterion for determining the strongest cell is RSRP(Reference Signal Received Power) information.



- First Detected Cell  
: Cell Selection and Cell Reselection operate according to 3GPP standard.
- Strongest Cell(Power On)  
: When the device is powered on, the cell selection will camp on the cell with the strongest Cell.
- Strongest Cell(Always)  
: When the device is powered on and entered idle state during operation, the Cell Selection with the strongest Cell is camped on.

### 3.4.1.2. Cell Lock

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings
  - LTE
    - Cell Selection
    - Cell Lock**
    - PCI Cell Lock
    - SIM Management
    - Default PDN
    - Multiple PDN
    - Internet MTU
    - IPv6 Settings
  - Network
  - Firewall
  - User Management
  - Firmware Management
  - Monitoring

**Cell Lock**

**Search Cell**

| Check                               | Index | DL EARFCN | PCI       | RSRP(dBm)   | RSRQ(dB)  | SINR(dB)  |
|-------------------------------------|-------|-----------|-----------|-------------|-----------|-----------|
| <input checked="" type="checkbox"/> | 1     | 42690     | 0x3c (60) | -85.3/-80.4 | -5.9/-6.0 | 31.4/33.7 |
| <input type="checkbox"/>            | 2     | 42888     | 0x3c (60) | -89.2/-95.7 | -6.2/-6.1 | 31.8/29.2 |

**Cell Lock List**

| Check | DL EARFCN | PCI |
|-------|-----------|-----|
|-------|-----------|-----|

Buttons: Add, Search, Add +, Delete, Delete All, Apply

If you want the device to camp on specific cell except others, you can use this menu. The device will only try to camp on the cell in the “Cell Lock List” if there is any item.

- Select “Settings” → “LTE” → “Cell Lock” from the menu.
- You can add current the cell to Cell Lock List or delete the cell to unlock from the list.
- You can manually add the cell by clicking “Add+” button.
- Finish setup by clicking the “Apply” button.

### 3.4.1.3. PCI Cell Lock

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings**
  - LTE**
    - Cell Selection
    - Cell Lock
    - PCI Cell Lock**
    - SIM Management
    - Default PDN
    - Multiple PDN
    - Internet MTU
    - IPv6 Settings
  - Network
  - Firewall
  - User Management
  - Firmware Management
  - Monitoring

**PCI Cell Lock**

**Search Cell**

| Check                               | Index | DL EARFCN | PCI       | RSRP(dBm)   | RSRQ(dB)  | SINR(dB)  |
|-------------------------------------|-------|-----------|-----------|-------------|-----------|-----------|
| <input checked="" type="checkbox"/> | 1     | 42690     | 0x3c (60) | -85.0/-81.1 | -5.9/-6.2 | 31.5/33.2 |
| <input type="checkbox"/>            | 2     | 42888     | 0x3c (60) | -89.6/-96.5 | -6.1/-6.1 | 31.6/28.7 |

**Add** **Search**

**PCI Cell Lock List** **Add +**

| Check                    | PCI |
|--------------------------|-----|
| <input type="checkbox"/> |     |

**Delete** **Delete All** **Apply**

If you want the device to camp on specific cell except others, you can use this menu. The device will only try to camp on the cell in the “PCI Cell Lock List” if there is any item.

PCI Cell Lock can be set up to 32 lists.

- Select “Settings” → “LTE” → “PCI Cell Lock” from the menu.
- You can add current the cell to PCI Cell Lock List or delete the cell to unlock from the list.
- You can manually add the cell by clicking “Add+” button.
- Finish setup by clicking the “Apply” button.

#### 3.4.1.4. SIM Management

| SIM Management                                                           |                      |
|--------------------------------------------------------------------------|----------------------|
| <b>PIN Information</b>                                                   |                      |
| PIN Status                                                               | PIN DISABLED         |
| RETRIES PIN                                                              | 3                    |
| RETRIES PUK                                                              | 10                   |
| <button>Refresh</button>                                                 |                      |
| <b>PIN Management</b>                                                    |                      |
| PIN Code                                                                 | <input type="text"/> |
| <button>Verify</button> <button>Enable</button> <button>Disable</button> |                      |
| <b>PIN Change</b>                                                        |                      |
| PIN Code                                                                 | <input type="text"/> |
| New PIN Code                                                             | <input type="text"/> |
| Confirm New PIN Code                                                     | <input type="text"/> |
| <button>Change</button>                                                  |                      |
| <b>PIN Unblock</b>                                                       |                      |
| PUK Code                                                                 | <input type="text"/> |
| New PIN Code                                                             | <input type="text"/> |
| <button>Unblock</button>                                                 |                      |
| <b>SIM Card Restriction</b>                                              |                      |

For giving higher security of using LTE, SIM (Subscriber Identification Module) can have PIN (Personal Identification Number) verification procedure. You can enable or disable SIM functionality by PIN and PUK (PIN Unblock Key).

- Select “Settings” → “LTE” → “SIM Management” from the menu.
- You can see the current status of SIM.
- Only the button operation is enabled to match the current status.
  - ✓ If your SIM card is locked, PIN Status shows “PIN ENABLED NOT VERIFIED”.
  - ✓ Then you should enter the PIN code and click the “Verify” button.
  - ✓ After success unlock PIN then you can attached the LTE network.
  - ✓ You can set new PIN code by unblocking with PUK code.
  - ✓ If you failed to unblock PIN, you never use this SIM card.
  - ✓ You can set IMSI Prefix (MCC/MNC) for SIM card restriction.  
00101 : 001 = MCC, 01 = MNC
  - ✓ Finish setup by clicking the “Apply” button.
  - ✓ PIN is 4 digit numbers, PUK is 8 digit numbers and IMSI prefix is 5 digit numbers.

### 3.4.1.5. Default PDN

| Menu                |  |
|---------------------|--|
| Dashboard           |  |
| Connection Mode     |  |
| Status              |  |
| Settings            |  |
| LTE                 |  |
| Cell Selection      |  |
| Cell Lock           |  |
| PCI Cell Lock       |  |
| SIM Management      |  |
| Default PDN         |  |
| Multiple PDN        |  |
| Internet MTU        |  |
| IPv6 Settings       |  |
| Network             |  |
| Firewall            |  |
| User Management     |  |
| Firmware Management |  |
| Monitoring          |  |

### Default PDN

#### Default PDN Connection

|                     |                                  |
|---------------------|----------------------------------|
| APN Name            | <input type="text"/>             |
| Authentication Type | <select value="PAP"></select>    |
| Username            | <input type="text"/>             |
| Password            | <input type="text"/>             |
| PDN Type            | <select value="IPv4v6"></select> |

Apply

A certain network requires the device to specify “APN (Access Point Name)”, “Authentication Type”, and “PDN Type” for Default PDN (Packet Data Network) Connection. If these parameters are not correct, the device can’t access to LTE network.

- Select “Settings” → “LTE” → “Default PDN” from the menu.
- You can set the PDN parameters such as APN Name, Authentication Type, Username, Password and PDN Type (IPv4, IPv6, IPv4v6).
- Put data in the box and click “Apply” button.

### 3.4.1.6. Multiple PDN

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings**
  - LTE**
    - Cell Selection
    - Cell Lock
    - PCI Cell Lock
    - SIM Management
    - Default PDN
    - Multiple PDN**
    - Internet MTU
    - IPv6 Settings
  - Network
  - Firewall
  - User Management
  - Firmware Management
  - Monitoring

**Multiple PDN**

**PDN Configure**

PDN cid: 2  
PDN Label: ims  
APN Name:   
Authentication Type: NONE  
PDN Type: IPv4v6  
Enable: ☐

**Apply** **Cancel**

**PDN Configure**

|                                  | Cid | PDN Label | PDN Type | APN Name | Auth Type | Username | Enable |
|----------------------------------|-----|-----------|----------|----------|-----------|----------|--------|
| <input checked="" type="radio"/> | 2   | ims       | IPv4v6   |          | NONE      |          | Off    |
| <input type="radio"/>            | 3   | admin     | IPv4     |          | NONE      |          | Off    |
| <input type="radio"/>            | 4   | app       | IPv4     |          | NONE      |          | Off    |

By default, the device is set as Default PDN (Packet Data Network) for LTE registration and PDN Connectivity. But if network requires Multiple PDN for using “internet”, “IMS (IP Multimedia Subsystem)” or any other purpose, you should set and enable Multiple PDN function by this menu.

- Select “Settings” → “LTE” → “Multiple PDN” from the menu.
- You can set the multiple PDN parameters for IMS, admin, and App services.
- Select “Cid”, check “Enable”, put data in the box, and then click “Apply” button.

### 3.4.1.7. Internet MTU

The screenshot shows a web interface for configuring the Internet MTU. On the left is a 'Menu' sidebar with options: Dashboard, Connection Mode, Status, Settings, LTE, Cell Selection, Cell Lock, PCI Cell Lock, SIM Management, Default PDN, Multiple PDN, Internet MTU (highlighted), IPv6 Settings, Network, Firewall, User Management, Firmware Management, and Monitoring. The main content area is titled 'Internet MTU' and contains the text: 'This page display the maximum number of bytes in the packets transmitted over the internet port.' Below this is a section 'Internet MTU Settings' with a label 'Internet MTU' and a text input field containing '1500'. To the right of the input field is a note: '(The default is 1500, do not change unless necessary.)'. An 'Apply' button is located at the bottom right of the settings section.

In case that LTE network requires the device to limit MTU (Maximum Transmission Unit) size, you can set in this menu. Change of MTU size is usually for IP packet management between LTE network entities. Normally, the default value, 1500 is used without any problem.

- Select “Settings” → “LTE” → “Internet MTU” from the menu.
- You can change the internet MTU size [Bytes].
- Put data in the box and then click “Apply” button.

### 3.4.1.8. IPv6 Settings

| Menu                |  |
|---------------------|--|
| Dashboard           |  |
| Connection Mode     |  |
| Status              |  |
| Settings            |  |
| LTE                 |  |
| Cell Selection      |  |
| Cell Lock           |  |
| PCI Cell Lock       |  |
| SIM Management      |  |
| Default PDN         |  |
| Multiple PDN        |  |
| Internet MTU        |  |
| IPv6 Settings       |  |
| Network             |  |
| Firewall            |  |
| User Management     |  |
| Firmware Management |  |
| Monitoring          |  |

| IPv6 Settings                 |                            |
|-------------------------------|----------------------------|
| IPv6 Setup                    |                            |
| IPv6 Enable                   | Enable                     |
| DHCPv6 Address Settings       |                            |
| DHCPv6 Autoconfiguration Mode | Stateful                   |
| Select DHCPv6 Prefix          | Manual                     |
| IPv6 Prefix                   | 2600:1010:b005:2bc7 ::/64  |
| Gateway IPv6 Address          | 2600:1010:b005:2bc7 ::0001 |
| Start IPv6 Address            | 2600:1010:b005:2bc7 ::0129 |
| End IPv6 Address              | 2600:1010:b005:2bc7 ::0255 |
| DNS Server Address Mode       | Auto                       |
| Apply                         |                            |

The device supports IPv6 and can be enabled or disabled by the menu. You can use IPv6 by its own purpose with DHCPv6 Auto-configuration – Stateless mode. IPv6 address is automatically assigned to its connected device. Or if you want to set IPv6 address manually (like DHCPv4), you can change the mode from Stateless to Stateful and set IPv6 Prefix, Gateway IPv6 address, and Start/End IPv6 address. Also, you can set DNS (Domain Name System) Server IPv6 Address manually.

- Select “Settings” → “LTE” → “IPv6 Setup” from the menu.
- You can enable or disable IPv6 function by selecting the list.
- You can set DHCPv6 Auto-configuration Mode by selecting the list.
- You can set DNS server address mode to “Auto” or “Manual”.
- After selecting the each mode, put in the data to all boxes.
- Finish setup by clicking the “Apply” button

### 3.4.1.9. CBSD Settings

The screenshot displays the 'CBSD Settings' web interface. On the left is a 'Menu' sidebar with options: Dashboard, Connection Mode, Status, Settings, and LTE. The 'LTE' section is expanded, showing sub-options: Basic, Cell Selection, Cell Lock, PCI Cell Lock, SIM Management, Default PDN, Multiple PDN, Internet MTU, IPv6 Settings, CBSD Settings, Network, Firewall, User Management, Firmware Management, Software, Monitoring, and Engineer. The main content area is titled 'CBSD' and features four tabs: 'Enable', 'Registration', 'Spectrum Inquiry', and 'Grant'. The 'Enable' tab is selected, showing the following settings:

- CBSD Enable:** Radio buttons for 'Enable' (selected) and 'Disable'.
- Select Category:** A dropdown menu currently showing 'Category B'.
- CBSD Status:** Radio buttons for 'Enable' and 'Disable' (selected).
- Status:** A text input field.
- Grant IDs:** Four text input fields labeled 'Grant1 ID', 'Grant2 ID', 'Grant3 ID', and 'Grant4 ID'.

An 'Apply' button is located at the bottom right of the 'Enable' tab.

The CBSD Setting page is shown only when the following two conditions are satisfied.

- Band-48 item should be checked in Band Selection section of LTE-Cell Selection.
- You must log in as the engineer account ID and PASSWORD when you login the WEB GUI (root / gksrmf28)

The device supports CBSD and can be enabled or disabled by the menu. The Citizens Broadband Radio Service Device (CBSD) function is used to connect with SAS Server to use CBRS.

- Select “Settings” → “LTE” → “CBSD Setup” from the menu.
- You can enable or disable CBSD function.
- You can set the Registration item, Spectrum Inquiry item and Grant item.
- Finish setup by clicking the “Apply” button.

- CBSD should be changed to Enable in order to use it because Default value is Disable.
- Items to check for initial setup
  - Sas URL, User ID, Category, Latitude, Longitude

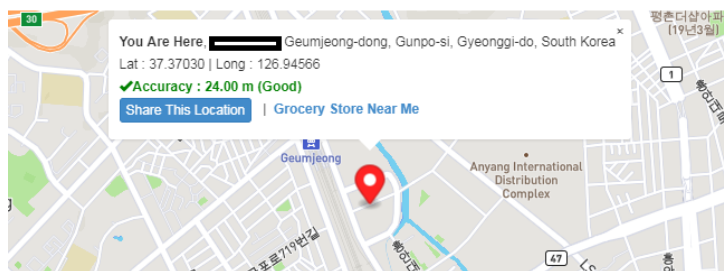
- Latitude, Longitude setting method

Information received from an LTE network does not have latitude and longitude.

Therefore, these values can not be set automatically.

You need to check and set latitude and longitude information yourself.

Go to the site : <https://mycurrentlocation.net/>



|               |                                                    |
|---------------|----------------------------------------------------|
| Latitude      | 37.37030                                           |
| Longitude     | 126.94566                                          |
| Altitude      |                                                    |
| Accuracy      | 24.00                                              |
| Location Name | Geumjeong-dong, Gunpo-si, Gyeonggi-do, South Korea |

- CBSD device category classification.

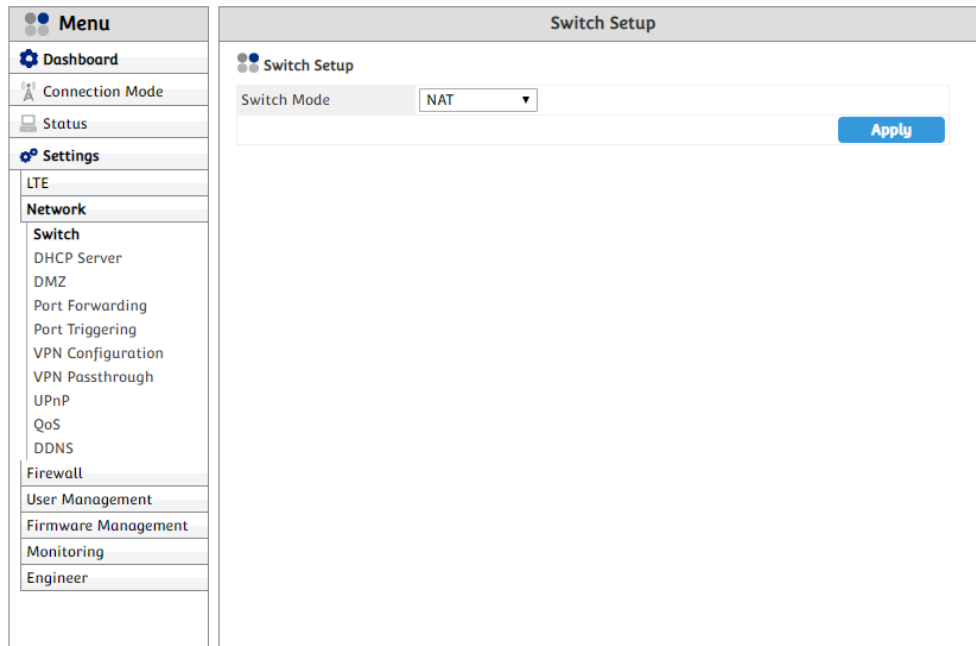
| CBSD Type             | Maximum EIRP (dBm/10 MHz) | Maximum EIRP (dBm/MHz) | Antenna Height (Meter) |
|-----------------------|---------------------------|------------------------|------------------------|
| Category A            | 30 dBm or 1 watt          | 20 dBm                 | < 6 meters             |
| Category B            | 47 dBm or 50 Watt         | 37 dBm                 | > 6 meters             |
| End User Device (EUD) | 23 dBm or 200 mili Watt   | NA                     | NA                     |

- SLC-120OGA : Available in Category B, Category A and EUD mode.

- You can use the max power limit by selecting the Category of the device.
  - If EUD is selected in the select category menu, CBSD does not work and the device operates below 23dBm.

### 3.4.2. Network

#### 3.4.2.1. Switch



- There are two kinds of mode in Switch Setup - “NAT” and “Bridge”.
  - ✓ Default PDN support both NAT and Bridge and other PDNs support NAT only. So if change Switch Mode then will apply to Default PDN.
  - ✓ NAT (Network Address Translation) is translation function between Private IP and Public IP address. If one user tries to send its data packets with 192.168.1.2 which is private IP address to outer network, then NAT will change that private IP address to public IP address like 119.200.124.81, which make that packets be regarded as Public IP packets. On the contrary, when packets from outer side come to CPE, NAT should decide which Private IP address to deliver. By this method, only Public IP address is used and known to outer network. So, local network inside CPE are protected.
  - ✓ Bridge mode ‘bridges’ Host LTE network and Guest LAN network. By this, guest device is directly networked to LTE, which binds two networks as one and work like one network. This “Bridge” means Guest network operates as same level as Host network.
    - ✗ On Bridge mode, CPE can’t use Network functions.
    - ✗ For using TR-069, activate “admin PDN” in “Settings”→“LTE”→“Multiple PDN”. If LTE registration is ok with admin PDN, then a user can use TR-069 function.
- How to change “Switch mode”
  - ✓ Goes to “Settings” → “Network” → “Switch” menu

- ✓ Select “NAT” or “Bridge” in Switch Mode menu
- ✓ Click “Apply button”. Applied Switch mode is activated after re-boot.

### 3.4.2.2. DHCP Server

**DHCP Server Settings**

Enable DHCP Server:

Gateway IP Address: 192 . 168 . 1 . 1

Gateway Subnet Mask: 255 . 255 . 255 . 0

Starting IP Address: 192 . 168 . 1 . 2

Number of users: 253

From ISP: ☒

Primary DNS: . . . .

Secondary DNS: . . . . Optional

Tertiary DNS: . . . . Optional

DHCP Lease Time: 3600 seconds

**Lease Reservation Table**

| Add                      |           | Del         |            | Searched List |                          | Add                               |  |
|--------------------------|-----------|-------------|------------|---------------|--------------------------|-----------------------------------|--|
| Select                   | Host Name | MAC Address | IP Address | Enable        | Select                   | IP/MAC Address                    |  |
| <input type="checkbox"/> |           |             |            |               | <input type="checkbox"/> | 192.168.1.101 / 08:9E:01:DE:9E:43 |  |

Up to 10 rules can be set

DHCP(Dynamic Host Configuration Protocol) Server assigns network configurations like IP address, Subnet Mask, and Default Gateway, to connected client devices automatically.

DHCP Server manages complicated IP address in efficient way and adapts to insufficient IP address. You can assign same IP address to a specific device through Lease Reservation Table. For this purpose, MAC address of that device is needed. DHCP Server manages connected clients by MAC address so, user can add or delete in easy way.

- How to set “DHCP Server” settings
  - ✓ Goes to “Settings” → “Network” → “DHCP Server”
  - ✓ Select “On” in Enable DHCP Server menu
  - ✓ Set Gateway IP address
  - ✓ Set Gateway Subnet Mask address
  - ✓ Set “Starting IP Address”. If there are values in “Starting IP Address”, then “Number of users” will be changed automatically. “Number of users” can be set from 1 to 253.
  - ✓ In case of “From ISP” is checked, DHCP Server assigns DNS address from ISP (Internet Service Provider) to its connected devices through LAN connection. If “From ISP” is not checked, those devices will have DNS addresses which are set manually.
  - ✓ You can set “DHCP Lease Time”. DHCP Lease Time is time limit of IP address, which is assigned dynamically from DHCP Server to DHCP client. If that time is expired, new dynamic IP address will be assigned to DHCP client automatically. DHCP Lease Time can have the value between 300 ~ 86400 seconds and 3600 seconds by default.
  - ✓ When IP/MAC Address is enlisted in “Lease Reservation Table”, DHCP Server assigns

specific IP address to that MAC address matched. In "Searched List", you can see IP/MAC address of the devices that are assigned IP address by DHCP Server. If you select one item and "Add", then that item will be enlisted on "Lease Reservation Table". The enlisted item can be edited or removed by user.

- ✓ If all settings are ready, then select "Apply button".The changes will be operated after re-boot.

### 3.4.2.3. DMZ

The screenshot shows a web management interface for a network device. On the left is a 'Menu' sidebar with options: Dashboard, Connection Mode, Status, Settings, LTE, Network, Switch, DHCP Server, DMZ, Port Forwarding, Port Triggering, VPN Configuration, VPN Passthrough, UPnP, QoS, DDNS, Firewall, User Management, Firmware Management, Monitoring, and Engineer. The 'DMZ' option is highlighted. The main content area is titled 'DMZ' and contains the following settings:

- Enable DMZ: ☐ Enable ☒ Disable
- Redirect ICMP To The Host: ☐ Enable ☒ Disable
- Exclude Web Server Port: ☒ Enable ☐ Disable
- Private LAN IP Address: 192 . 168 . 1 . 2

An 'Apply' button is located at the bottom right of the settings area.

- DMZ(Demilitarized Zone) function makes local network connected PC be opened to internet, and that will make bidirectional communication between internal host and external host without any restriction. DMZ enabled host is all port opened condition. So, if you want to use specific application programs like IP camera and Database management software but don't know which port to open, then you can set that PC as DMZ host.

Warning! DMZ is proper function when a user doesn't have information which port to be opened. But that DMZ host is entirely open to internet environment, which may bring potential security problem. If DMZ function is not necessary, please disable DMZ.

- How to use "DMZ"
  - ✓ Goes to "Settings" → "Network" → "DMZ"
  - ✓ Check "Enable" in Enable DMZ item
  - ✓ Input IP address that want to open all ports, in "Private LAN IP Address"
  - ✓ Even in DMZ mode, there are two exceptional configurations.
    - If you want to let ICMP packet to be delivered to DMZ host, please enable "Redirect ICMP to the host"
    - If you want to exclude Web Server Port of the device, please enable "Exclude Web Server Port"
  - ✓ If all settings are ready, then select "Apply button". The changes will be operated after re-boot.

### 3.4.2.4. Port Forwarding

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings
  - LTE
  - Network**
    - Switch
    - DHCP Server
    - DMZ
    - Port Forwarding**
    - Port Triggering
    - VPN Configuration
    - VPN Passthrough
    - UPnP
    - QoS
    - DDNS
  - Firewall
  - User Management
  - Firmware Management
  - Monitoring
  - Engineer

**Port Forwarding**

Name:  [View Existing Application](#)

Protocol:

Start Port:

End Port:  (Blank or Start Port-65535)

Destination IP:  .  .  .

Destination Port:  (Blank or 1-65535)

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

**Port Forwarding List**

| No. | Name | Start Port | End Port | Protocol | IP Address    | Destination Port |                                          |
|-----|------|------------|----------|----------|---------------|------------------|------------------------------------------|
| 1   | FTP  | 21         | 21       | BOTH     | 192.168.1.100 | 21               | <a href="#">Edit</a> <a href="#">Del</a> |

Up to 10 rules can be set

- Select “Settings” → “Network” → “Port Forwarding” from the menu.
- What is “Port Forwarding”?
  - ✓ One of NAT(Network Address Translation) function. “Port Forwarding” opens specific port and make communication available through that opened port. This function is used in case that external host wants to activate a service for the host in internal network. When packets arrive from external network, those are managed by destination IP address, port and the rule that a user sets, and are matched to specific host. Communication between internal host and external network with specific port, is available through this way.
- Configure Port Forwarding Setting.
  - ✓ Input “Name”. You can reference it with click “View Existing Application”, which shows the application name that is generally used.
  - ✓ Select one of the listed Protocols (BOTH, TCP, UDP).
  - ✓ Enter Start port, End Port, Destination IP address and Destination Port.
  - ✓ For example, if you want to use one PC connected to this CPE as FTP server, you can configure as set on the picture above. 192.168.1.100 is IP address of that connected PC. You can find IP address of connected PC (or other network device) in that PC’s network configuration.
  - ✓ You can change the range of the external port by change of “Start port ~ End port”.
  - ✓ “Destination IP” and “Destination Port” are for the PC (or network device) connected to CPE.
  - ✓ Click the “Add” button when you finished.
  - ✓ You can change the data by clicking “Edit” or “Del” button in the list.

### 3.4.2.5. Port Triggering

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings
  - LTE
  - Network
    - Switch
    - DHCP Server
    - DMZ
    - Port Forwarding
    - Port Triggering**
    - VPN Configuration
    - VPN Passthrough
    - UPnP
    - QoS
    - DDNS
    - Firewall
    - User Management
    - Firmware Management
    - Monitoring
    - Engineer

**Port Triggering**

**Port Trigger Settings Table**

|                  |     |              |             |
|------------------|-----|--------------|-------------|
| Name             | IRC | Port Type    | RANGE       |
| Trigger Protocol | ALL | Trigger Port | 6660 - 7000 |
| Open Protocol    | ALL | Open Port    | 113 - 113   |

Save Cancel

**Port Trigger List**

| No. | Name | Trigger Protocol | Trigger Port(s)   | Open Protocol | Open Port(s)      | Edit | Del |
|-----|------|------------------|-------------------|---------------|-------------------|------|-----|
|     |      |                  | StartPort EndPort |               | StartPort EndPort |      |     |
| 1   | IRC  | all              | 6660 7000         | all           | 113 113           | Edit | Del |

Up to 10 rules can be set

- Select “Settings” → “Network” → “Port Triggering” from the menu.
- What is “Port Triggering”?
  - ✓ Port Triggering is automated version of Port Forwarding. “Port Forwarding” forwards its packet to fixed IP address and port that a user sets, but “Port Triggering” forwards received packets to pre-defined Triggering port range of local network that client is belonged to.
  - ✓ Application programs like FTP and IRC (Internet Relay Chat) use several ports when it responses. If one session is opened and starts to send, additional ports open operation for receiving packets, can be done by “Port Triggering”.
- Configure Port Triggering
  - ✓ Input “Name” item according to purpose
  - ✓ Select “Port Type” that apply to Port Range
  - ✓ Set “Trigger Protocol” and “Trigger Port”. These items are for the client in the local network (LAN).
  - ✓ “Open Protocol” and “Open Port” is for external (WAN) port that will be used in Triggering.
  - ✓ Click the “Add” button when you finished.
  - ✓ You can change the data by clicking “Edit” or “Del” button in the list.
- Port Triggering Example

One of application that uses Port Triggering is IRC (Internet Relay Chat). IRC authenticates user by IDENT protocol through port 113, generally. When client PC tries to connect to IRC server, it uses port 6667 (or port range 6660 ~ 7000) for connection request message. In response to this, IRC

server send identification message through port 6667 and port 113 additionally. So, port 113 must be opened to client PC. If user sets as picture above, then CPE will open port 113 automatically and deliver packets through that, when it detects session over port 6667 is started.

### 3.4.2.6. VPN Configuration

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings
- LTE
- Network**
- Switch
- DHCP Server
- DMZ
- Port Forwarding
- Port Triggering
- VPN Configuration**
- VPN Passthrough
- UPnP
- QoS
- DDNS
- Firewall
- User Management
- Firmware Management
- Monitoring
- Engineer

**VPN Configuration**

**VPN Configuration Settings**

VPN: GRE

**Add GRE Tunnel**

Tunnel Destination IP Address: . . .

GRE Interface IP Address: . . .

GRE Interface Remote IP Address: . . .

Remote Private IP Address: . . .

Key: 0-4294967295

Checksum: Enable

**Add** **Reset**

**GRE Configuration List**

| Tunnel DEST IP | GRE I/F IP | GRE R/F IP | Private Address | Key | Checksum | Operation |
|----------------|------------|------------|-----------------|-----|----------|-----------|
|----------------|------------|------------|-----------------|-----|----------|-----------|

**Apply** **Cancel**

- Input GRE (Generic Routing Encapsulation) configuration items and “Add” to “GRE Configuration List”. Click “Apply button” will bring re-boot of CPE. GRE VPN (Virtual Private Network) will be operated after that.
- GRE Tunnel can have 5 items maximum.
- Tunnel Destination IP Address : External IP address of CPE (LTE IP)
- GRE Interface IP Address : GRE Interface Private IP Address of CPE
- GRE Interface Remote IP Address : WAN IP Address of remote device
- Remote Private IP Address : GRE Interface Private IP Address of remote device
- Key value can have the range of 0~4294967295.

| Menu                |  |
|---------------------|--|
| Dashboard           |  |
| Connection Mode     |  |
| Status              |  |
| Settings            |  |
| LTE                 |  |
| Network             |  |
| Switch              |  |
| DHCP Server         |  |
| DMZ                 |  |
| Port Forwarding     |  |
| Port Triggering     |  |
| VPN Configuration   |  |
| VPN Passthrough     |  |
| UPnP                |  |
| QoS                 |  |
| DDNS                |  |
| Firewall            |  |
| User Management     |  |
| Firmware Management |  |
| Monitoring          |  |
| Engineer            |  |

| VPN Configuration                                                          |            |
|----------------------------------------------------------------------------|------------|
| VPN Configuration Settings                                                 |            |
| VPN                                                                        | L2TP       |
| L2TP Mode                                                                  |            |
| Server Address                                                             |            |
| Server Address(Private)                                                    | Enable     |
| Private Server Address                                                     |            |
| Username                                                                   |            |
| Password                                                                   |            |
| Pre Shared Key                                                             |            |
| Connect Mode                                                               | Keep Alive |
| Redial Period                                                              | Seconds    |
| <input type="button" value="Apply"/> <input type="button" value="Cancel"/> |            |

- Input L2TP (Layer 2 Tunneling Protocol) configuration items. Click “Apply button” will bring re-boot of CPE and then L2TP VPN is operated after that.
- If “Private Server Address” is needed for L2TP VPN connection, then enable “Ser Address(Private)” and input “Private Server Address” after that.
- “Connect Mode” has two options - Keep Alive / Manual.
- “Keep Alive” attempts to connect periodically by the time defined in “Redial Period”. “Manual” attempts only one time at the boot-up.

| Menu                |  |
|---------------------|--|
| Dashboard           |  |
| Connection Mode     |  |
| Status              |  |
| Settings            |  |
| LTE                 |  |
| Network             |  |
| Switch              |  |
| DHCP Server         |  |
| DMZ                 |  |
| Port Forwarding     |  |
| Port Triggering     |  |
| VPN Configuration   |  |
| VPN Passthrough     |  |
| UPnP                |  |
| QoS                 |  |
| DDNS                |  |
| Firewall            |  |
| User Management     |  |
| Firmware Management |  |
| Monitoring          |  |
| Engineer            |  |

| VPN Configuration                                                          |            |
|----------------------------------------------------------------------------|------------|
| VPN Configuration Settings                                                 |            |
| VPN                                                                        | PPTP       |
| PPTP Mode                                                                  |            |
| User MPPE                                                                  | Disable    |
| Server Address                                                             |            |
| Username                                                                   |            |
| Password                                                                   |            |
| Connect Mode                                                               | Keep Alive |
| Redial Period                                                              | Seconds    |
| <input type="button" value="Apply"/> <input type="button" value="Cancel"/> |            |

- Input PPTP (Point-to-Point Tunneling Protocol) configuration items. Click “Apply button” will bring re-boot of CPE and then PPTP VPN is operated after that.
- User can use “User MPPE (Microsoft Point-to-Point Encryption)” by selection of Enable/Disable.
- “Connect Mode” has two options - Keep Alive / Manual.
- “Keep Alive” attempts to connect periodically by the time defined in “Redial Period”. “Manual” attempts only one time at the boot-up.

### 3.4.2.7. VPN Passthrough

The screenshot displays the 'VPN Passthrough' configuration page. On the left, a 'Menu' sidebar lists various system settings, with 'VPN Passthrough' highlighted under the 'Network' section. The main content area, titled 'VPN Passthrough', contains the 'VPN Pass Through Settings'. It features a 'VPN Service' dropdown menu and two checked checkboxes for 'PPTP Service' and 'L2TP/IPSEC Service'. An 'Apply' button is located at the bottom right of the settings area.

- Select “Settings” → “Network” → “VPN Pass through” from the menu.
- The device supports 2 types of service: PPTP Service, L2TP/IPSEC Service.
- Select the type(s) of VPN pass through to use with the checkboxes.
- Finish setup by clicking the “Apply” button.

### 3.4.2.8. UPnP

The screenshot displays the UPnP configuration page. On the left, the 'Menu' sidebar is visible with the following items: Dashboard, Connection Mode, Status, Settings, LTE, Network (selected), Switch, DHCP Server, DMZ, Port Forwarding, Port Triggering, VPN Configuration, VPN Passthrough, UPnP (highlighted), QoS, DDNS, Firewall, User Management, Firmware Management, Monitoring, and Engineer. The main content area is titled 'Universal Plug & Play'. It features a section for 'UPnP Enable/Disable' with radio buttons for 'Enable' (selected) and 'Disable', and an 'Apply' button. Below this is a 'Client List' section with a table header: No., Client Program, Protocol, External Port, IP Address, and Internal Port. A 'Refresh' button is located at the bottom right of the table.

- Select “Settings” → “Network” → “UPnP” from the menu.
- What is “UPnP(universal plug and play )”?
  - ✓ The interface standard for home appliances for access of home network. This is expanded version of “Plug and Play” which was originally adopted in Windows Operating System. Those devices that support UPnP can recognize each other in the network connected, without any configuration change.
- Select whether or not to enable the Universal Plug & Play function.
  - ✓ If this function is enabled, CPE will provide internet gateway device and port mapping protocol services to the UPnP supported clients. This function also allows the client in the LAN network to request ‘re-assign new port’, and gives compatibility with peer-to-peer software that is connected to ‘Xbox Live and PlayStation Network included online services’, messaging application programs, and game consoles. You can check current UPnP clients in the “Client List”.
- Finish setup by clicking the “Apply” button.

### 3.4.2.9. QoS

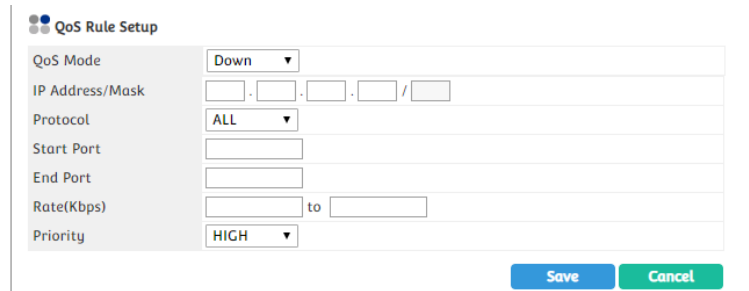
The screenshot displays the QoS configuration interface. On the left, a sidebar menu lists various settings, with 'QoS' highlighted under the 'Network' category. The main content area is titled 'QoS' and is divided into three sections:

- QoS Setup:** Includes a 'QoS Enable/Disable' section with radio buttons for 'Disable' and 'Enable' (selected). Below it is a 'Download(kbps)' input field set to '10000'. A note states: 'Setting QoS on device might be mandatory for access control and usage tracking, but suffering a performance hit is strictly optional.'
- QoS Rule Setup:** Features a 'QoS Mode' dropdown menu currently set to 'Down', with 'Add' and 'Cancel' buttons to its right.
- QoS List:** Titled 'Download(WAN -> LAN)', it contains a table with columns: 'No.', 'IP Address/Mask', 'Protocol', 'Port', 'Rate(Kbps)', and 'Priority'. Below the table, it says 'Up to 10 rules can be set' and includes an 'Apply' button.

QoS(Quality of Service) is used for maximize its usage of limited bandwidth, and optimize its load. This function can allocate minimum or maximum bandwidth to those PCs connected. So, in case that one PC occupies too much bandwidth load, QoS can control that PC's bandwidth and minimize its influence to others for seamless internet environment.

- How to set “QoS”,

- ✓ Goes to “Settings” → “Network” → “QoS”
- ✓ If you want to limit total Upload and Download speed, you need to set “Upload(kbps)” and “Download(kbps)” in the “QoS Setup” menu. Upload and Download can be changed by the selection menu in the “QoS Rule Setup” and “QoS Mode”.
- Warning! The sum of each IP address' Uploader Download speed can't be more than the total Upload and Download speed.
- ✓ You can configure Upload and Download speed separately by each IP address.
- ✓ At first, select Upload or Download in the “QoS Rule Setup” and “QoS Mode” menu.
- ✓ After that click “Add button”. Then additional configuration menu will be displayed as below image for setting up items differently by IP address.



**QoS Rule Setup**

QoS Mode: Down

IP Address/Mask: . . . /

Protocol: ALL

Start Port:

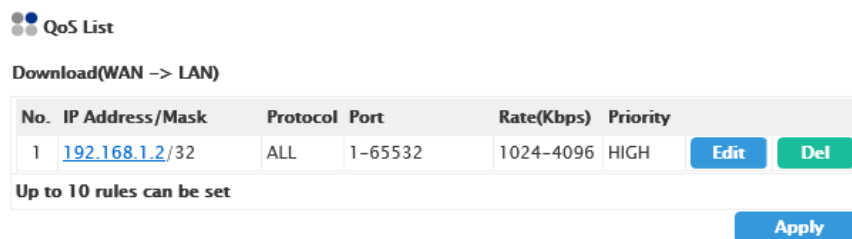
End Port:

Rate(Kbps): to

Priority: HIGH

Save Cancel

- ✓ Input "IP Address/Mask".
- ✓ You can select "ALL / TCP / UDP" in the "Protocol" menu as per uses.
- ✓ Input "Start Port" and "End Port". Full port range is "1~65532".
- ✓ Now you must define "Upload" and "Download" speed range in the "Rate(kbps)" menu.
- ✓ Each IP address can have "Priority" which is one of "HIGH/MEDIUM/LOW". "HIGH" is highest priority than other IP address.
- ✓ After setting up all items in the menu, you can click "Save" for saving all values. If all values are valid, then one item will be showed on "QoS List".



**QoS List**

Download(WAN -> LAN)

| No. | IP Address/Mask                | Protocol | Port    | Rate(Kbps) | Priority |          |
|-----|--------------------------------|----------|---------|------------|----------|----------|
| 1   | <a href="#">192.168.1.2/32</a> | ALL      | 1-65532 | 1024-4096  | HIGH     | Edit Del |

Up to 10 rules can be set

Apply

- ✓ Saved item can be edited or deleted by the "QoS List" menu.
- ✓ Maximum 10 items can be saved.

### 3.4.2.10. DDNS

The screenshot shows the DDNS configuration page. On the left is a navigation menu with 'Network' selected, which has expanded to show 'DDNS'. The main panel is titled 'DDNS' and contains a 'Dynamic DNS' section. The 'DDNS Enable' toggle is turned on. Below it, the 'DDNS Setting' section includes fields for Service (dyndns.org), Hostname (hostname), Username (username), Password (password), Check for change IP every (300), Check-time unit (seconds), Force update every (80), and Force-Time unit (minutes). An 'Apply' button is located at the bottom right of the settings area.

- Select “Settings” → “Network” → “DDNS” from the menu.
- What is “DDNS(Dynamic DNS)”?
  - ✓ DNS(Domain Name Server) is updated real time base. Usually, it is used when clients have assigned IP address dynamically. Even though IP address is changed, domain name is same on DDNS as user sets. So, it can be accessed to the client from outside the network in convenient way.
- Set the DDNS environment
  - ✓ If you want to set the DDNS, check “Enable” in the checkbox to enter necessary inputs.
  - ✓ For activation of DDNS operation, an account is needed that is given by DDNS service provider. This DDNS account is provided by the contract between DDNS service provider and user, not by the CPE manufacturer. (DDNS service account can be charged by the service provider based on its service policy.)
  - ✓ Select DDNS service provider that provides DDNS account in “Service” menu.
  - ✓ If your DDNS service provider is not listed in “Service” menu, then select “Custom URL” menu and input its URL address manually.

This is a close-up of the 'Service' dropdown menu. The dropdown is open, and 'Custom URL' is selected. Below the dropdown, there is a text field labeled 'Custom update-URL' which contains the value 'seowon.com'.

- ✓ “Hostname” is unique address that given by the DDNS service provider. (This can be different by DDNS service provider. So, you can check this with DDNS service provider or you can use “Service” and “Custom URL” instead.)
- ✓ “Username” and “Password” are account information given by DDNS service provider.

- ✓ “Check for change IP every” and “Check-time unit” are checking time period of DDNS IP change.
- ✓ Current DDNS configurations are updated unconditionally at the time of “Force update every” and “Force-Time unit”.
- ✓ After entering all the necessary information for DDNS setting, finally, click the “Apply” button to finish setting.

### 3.4.3. Firewall

#### 3.4.3.1. Basic

| Firewall                                                                                                              |                                                                       |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <b>Firewall Setup</b>                                                                                                 |                                                                       |
| Firewall Enable/Disable                                                                                               | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Allow Ping From WAN                                                                                                   | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Allow HTTP login from WAN                                                                                             | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Allow HTTPS login from WAN                                                                                            | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |
| Multicast Filter                                                                                                      | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |
| <b>Apply</b>                                                                                                          |                                                                       |
| <b>SIP ALG Settings</b>                                                                                               |                                                                       |
| The modem supports the SIP ALG function. The SIP application can run and communicate with other internet application. |                                                                       |
| Enable SIP ALG                                                                                                        | <input type="checkbox"/>                                              |
| SIP port                                                                                                              | 5060                                                                  |
| <b>Apply</b>                                                                                                          |                                                                       |

- Network security configuration can be managed in “Firewall” menu. Network security policy like ‘access block of unauthorized network devices’ can be operated safely.
  - ✓ Allow Ping From WAN  
If enabled, ICMP (Internet Control Message Protocol) packets from external WAN is blocked, so IP address will not be opened to outside.
  - ✓ Allow HTTP login from WAN  
If enabled, remote management access from external WAN is allowed. Management access by LAN is always available, regardless of this option.
  - ✓ Multicast Filter  
If enabled, Multicast traffic from external WAN is blocked for protection of internal devices.
- SIP (Session Initiation Protocol) ALG (Application Level Gateway) function is used for blocking communication between SIP application and other internet-connected applications.
- For basic firewall configuration,
  - ✓ Goes to “Settings”->“Firewall”->“Basic”
  - ✓ Select “Enable” in the “Firewall Setup” ->“Firewall Enable/Disable” menu.
  - ✓ Click “Apply button” for saving the configuration.
- For SIP ALG configuration,
  - ✓ Click check box in the “SIP ALG Settings”->“Enable SIP ALG” menu.
  - ✓ Input SIP port which range is 1 ~ 65534.
  - ✓ Click “Apply button”. Changed configurations will be operated after re-boot.

### 3.4.3.2. Filter Setup

- With “Filter Setup”, user can block packet transaction between internal LAN connected client and WAN. Also specific network service can be blocked. By the rules of packet filtering that a user set, internal network can be protected from outside and internet usage can be limited for kids.  
Warning! Network filter is operated based on time set on CPE. A user must check currently operated time in the menu “Settings” ->“User Management” ->“Date and Time”.
- “Filter Setup” supports 3 types of filter. You can select one of them in the “Select Filter” menu. Maximum 10 items for each filter are available.
  - ✓ IP Filter / URL Filter / MAC Filter

- For network filter configuration,
  - ✓ Goes to “Settings” ->“Firewall” ->“Filter Setup”
- For using “URL Filter”,

- ✓ Select “Enable” in the “Filter Setup” ->“URL Filter Enable” menu.
  - ✓ Click “Apply button”. Changed configurations will be operated after re-boot.  
Warning! If URL Filter is enabled, network performance will be lowered. If you don’t use this function, disable URL Filter.
- For “IP Filter” configuration,
  - ✓ Select “IP Filter” in the “Select Filter” menu.

- ✓ Click “Add button” for additional configurations as below.

|                                   |                                                                                                                                                                                                                                                          |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Select Filter                     | IP Filter                                                                                                                                                                                                                                                |
| Policy                            | DROP                                                                                                                                                                                                                                                     |
| Name                              |                                                                                                                                                                                                                                                          |
| Source IP                         | <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> / <input type="text"/>                                                                                                                                         |
| Destination IP Address            | <input type="text"/> . <input type="text"/> . <input type="text"/> . <input type="text"/> / <input type="text"/>                                                                                                                                         |
| Start Port                        | <input type="text"/>                                                                                                                                                                                                                                     |
| End Port                          | <input type="text"/>                                                                                                                                                                                                                                     |
| Protocol                          | BOTH                                                                                                                                                                                                                                                     |
| Blocked Day                       | <input checked="" type="checkbox"/> Every Day <input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wed <input type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Sun |
| Blocked Time                      | <input checked="" type="checkbox"/> 24 Hours <input type="text"/> HH : <input type="text"/> MM To <input type="text"/> HH : <input type="text"/> MM                                                                                                      |
| Enable                            | <input checked="" type="checkbox"/>                                                                                                                                                                                                                      |
| <div>Save</div> <div>Cancel</div> |                                                                                                                                                                                                                                                          |

- ✓ “Policy” menu only has “DROP” option.
- ✓ Input proper name on “Name” menu.
- ✓ Input “Source IP” and “Destination IP Address” that want to apply.
- ✓ Input “Start Port” and “End Port”.
- ✓ Select one of “BOTH/TCP/UDP” in the “Protocol” menu.
- ✓ You can select a day or days of a week that filter activated. If “Every Day” is selected, filter will be operated everyday.
- ✓ Input “Blocked Time”. Filter will be activated during the time set in the day of “Blocked Day”. If “24 Hours” is checked, filter is work on the day selected in “Blocked Day”.
- ✓ If both “Every Day” and “24 Hours” are checked, then filter will be operated every day regardless of what is checked in the day.
- ✓ After checking “Enable” check box, click “Save button”, then changed configurations will be saved.
- ✓ If “Enable” check box is not checked and “Save” after that, filter will not be operated even though filter configurations are saved.
- ✓ “Cancel button” will initiate all configurations.
- For “URL Filter” configuration,
  - ✓ Select “URL Filter” in the “Select Filter” menu.
  - ✓ Click “Add button” for additional configurations as below.

|                                   |                                                                                                                                                                                                                                                          |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Select Filter                     | URL Filter                                                                                                                                                                                                                                               |
| Policy                            | DROP                                                                                                                                                                                                                                                     |
| Name                              |                                                                                                                                                                                                                                                          |
| URL Address                       | <input type="text"/>                                                                                                                                                                                                                                     |
| Blocked Day                       | <input checked="" type="checkbox"/> Every Day <input type="checkbox"/> Mon <input type="checkbox"/> Tue <input type="checkbox"/> Wed <input type="checkbox"/> Thu <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Sun |
| Blocked Time                      | <input checked="" type="checkbox"/> 24 Hours <input type="text"/> HH : <input type="text"/> MM To <input type="text"/> HH : <input type="text"/> MM                                                                                                      |
| Enable                            | <input checked="" type="checkbox"/>                                                                                                                                                                                                                      |
| <div>Save</div> <div>Cancel</div> |                                                                                                                                                                                                                                                          |

- ✓ “Policy” menu only has “DROP” option.
- ✓ Input proper name on “Name” menu.
- ✓ Input URL address that want to block. Those sites that include the URL address input can’t

be accessed. If you want to block specific site, then input accurate address in the “URL Address” menu.

- ✓ “Blocked Day / Blocked Time / Enable” menu work same as described in “IP Filter” configuration.
- ✓ After input all configurations and click “Save button” for saving user change. “Cancel button” click will initiate all changes up to that point, and then need to input from the beginning.
- For “MAC Filter” configuration,
  - ✓ Select “MAC Filter” in the “Select Filter” menu.
  - ✓ Click “Add button” for additional configurations as below.

- ✓ “Policy” menu only has “DROP” option.
- ✓ Input proper name on “Name” menu.
- ✓ Click “View Existing Device” for checking currently connected devices and select one of them if needed.

| Existing device list |             |               |                   |
|----------------------|-------------|---------------|-------------------|
| No.                  | Device Name | IP Address    | MAC Address       |
| 1                    | Unknown     | 192.168.1.101 | 08:9e:01:de:9e:43 |

- ✓ If a user clicks “Select button”, “Device Name / MAC Address” is input automatically in the menu.
- ✓ “Blocked Day / Blocked Time / Enable” menu work same as described in “IP Filter” configuration.
- ✓ After input all configurations and click “Save button” for saving user change. “Cancel button” click will initiate all changes up to that point, and then need to input from the beginning.

- All filter rules saved are displayed by each filter in the “Filter List”. If a user selects filter type in “Select Filter” menu, different filter rules saved will be listed.

Filter List

| No. | Policy | Name    | MAC Address       | Protocol | Status |  |                                            |
|-----|--------|---------|-------------------|----------|--------|--|--------------------------------------------|
| 1   | DROP   | Unknown | 08:9E:01:DE:9E:43 | BOTH     | y      |  | <button>Edit</button> <button>Del</button> |

Up to 10 filter can be set

- If you want to edit saved filter,
  - ✓ Select one filter type to change in the “Select Filter” menu.

- ✓ Click “Edit button” to edit among the “Filter List” items.
- ✓ Then additional configuration window will be showed like “Add button” click in the “Select Filter”. Those configurations have the value from the one user selects, so user can change and save after that.
- ✓ If a user doesn’t want to edit, then click “Cancel button”.
- If you want to delete saved filter,
  - ✓ Select one filter type to delete in the “Select Filter” menu.
  - ✓ Click “Del button” in the “Filter List” will delete that filter immediately.

### 3.4.3.3. Access Control

The screenshot displays the 'Access Control' configuration page. On the left is a 'Menu' sidebar with various system management options. The main content area is divided into three sections:

- Access Control:** Includes radio buttons for 'Access Control Enable' (set to 'Disable') and 'Default Access Mode' (set to 'Black List'). An 'Apply' button is present.
- Black List:** Features a table with columns 'Device Name', 'MAC Address', and 'Modify'. Below the table is a note 'Up to 10 filter can be set' and an 'Add' button.
- Devices Online:** Features a table with columns 'Device Name', 'IP Address', and 'MAC Address'. Below the table is an 'Add checked' button.

“Access Control” function can control the device (PC, Smartphone, etc.) accessibility to CPE by management of “White List” that is list of access granted to CPE, and “Black List” that is blocked to access CPE. In case that “White List” is set, only those devices in the list can access to CPE. Otherwise, “Black List” is set, those devices can’t access to CPE. “White List” and “Black List” can’t be used at the same time. Only one “List” is available at one time.

- Access Control
  - ✓ Access Control Enable : Enable / Disable of Access Control function
  - ✓ Default Access Mode : List that need to apply (Black List / White List)
  - ✗ White List : Device list of access granted
  - Black List : Device list that is blocked
- Black List or White List
  - ✓ Enlisted devices will be showed by “Black List” or “White List”
  - ✓ “Add” : Add one device to the selected list in “Default Access Mode”
  - ✓ Delete checked : Delete selected devices in the list of “Default Access Mode”.
- Device Online
  - ✓ Device list of currently connected to CPE.
- Access Control Configuration
  - ✓ Goes to “Settings” ->“Firewall” ->“Access Control” menu.
  - ✓ Select “Enable” in the “Access Control Enable” menu.
  - ✓ Select one of “Black List” or “White List” in the “Default Access Mode” menu.
  - ✓ Click “Apply button” for apply changed configuration.

- Add a device to the List

- ✓ Click “Add button” and input “Device Name” and “MAC Address”.

- ✓ Or select one of devices in the “Devices Online” and Click “Add checked button”.

Devices Online Add checked

|                                     | Device Name | IP Address    | MAC Address       |
|-------------------------------------|-------------|---------------|-------------------|
| <input checked="" type="checkbox"/> | Unknown     | 192.168.1.101 | 08:9E:01:DE:9E:43 |

- Delete a device in the List

- ✓ Click “Del button” at the end of the list information.

Black List

|                          | Device Name | MAC Address       | Modify                             |
|--------------------------|-------------|-------------------|------------------------------------|
| <input type="checkbox"/> | Unknown     | 08:9E:01:DE:9E:43 | <span>Edit</span> <span>Del</span> |

Up to 10 filter can be set

Add Delete checked

- ✓ Or check the check box at the first column of the list and click “Delete checked button”.

Black List

|                                     | Device Name | MAC Address       | Modify                             |
|-------------------------------------|-------------|-------------------|------------------------------------|
| <input checked="" type="checkbox"/> | Unknown     | 08:9E:01:DE:9E:43 | <span>Edit</span> <span>Del</span> |

Up to 10 filter can be set

Add Delete checked

- White List Activation and Device Addition Example

- ✓ Select “Enable” in the “Access Control Enable” menu.
- ✓ Select “White List” in the “Default Access Mode” menu.
- ✓ Click “Apply button” for applying configuration changed.
- ✓ Click “Add button” for input “Device Name” and “MAC Address”.

Create a rule

✕

All form fields are required.

Device Name

MAC Address

Create a rule

Cancel

✓ Check added device is in the “White List”.

White List

| <input type="checkbox"/> | Device Name | MAC Address       | Modify          |                |
|--------------------------|-------------|-------------------|-----------------|----------------|
| <input type="checkbox"/> | Unknown     | 00:12:07:00:11:22 | <div>Edit</div> | <div>Del</div> |

Up to 10 filter can be set

Add

Delete checked

### 3.4.3.4. IP-MAC Binding

- Select “Settings” -> “Firewall” -> “IP-MAC Binding” in the menu.
- What is “IP-MAC Binding”?
  - ✓ IP-MAC Binding makes that specific IP address is assigned only to the client that has specific MAC address. This function will prevent unwanted device’s use of specific IP address which is defined for specific use.
  - ✓ Even if one network client assigns static IP address, CPE checks that IP address is registered in IP-MAC Binding List. Also even if it is registered, the client’s MAC address is checked that IP address and MAC address are matched or not. If MAC address is not matched one, that device’s network access is blocked.
- If you want to use the IP-MAC Binding function, check the “Enable” checkbox.
- Click “Add button” for new IP-MAC Binding rule. Or click “Bind button” that want to be add in the “ARP (Address Resolution Protocol) List”.

- When IP-MAC Binding configuration window is displayed, input IP address and MAC address. (In case that click “Bind button” in the “ARP List”, all configurations are already set automatically.) IP-MAC Binding is operated when “Status” is checked in “Enable”. If “Status” is set as “Disable”, then IP-MAC Binding is not functional even if “Bind List” has items. After all configurations are done, click “Save button” for saving configuration or click “Cancel button” for quit configuration.

- “ARP List” shows clients list of currently found in the network.
- Even though one item is deleted by “Del button” in the “ARP List”, that item can be displayed in the case that re-registration is done by ARP.

### 3.4.4. User Management

#### 3.4.4.1. Account

The screenshot displays the 'Account' management interface. On the left is a 'Menu' sidebar with various system settings. The main area is titled 'Account' and contains two sections. The 'Account Management' section includes a 'Privilege' dropdown menu (currently set to 'system'), a 'Username' text field (containing 'system'), and three password fields: 'Current Password', 'New Password', and 'Confirm Password'. An 'Apply' button is located to the right of these fields. Below this is the 'Customer Name' section, which features a 'Customer Name' text input field and another 'Apply' button.

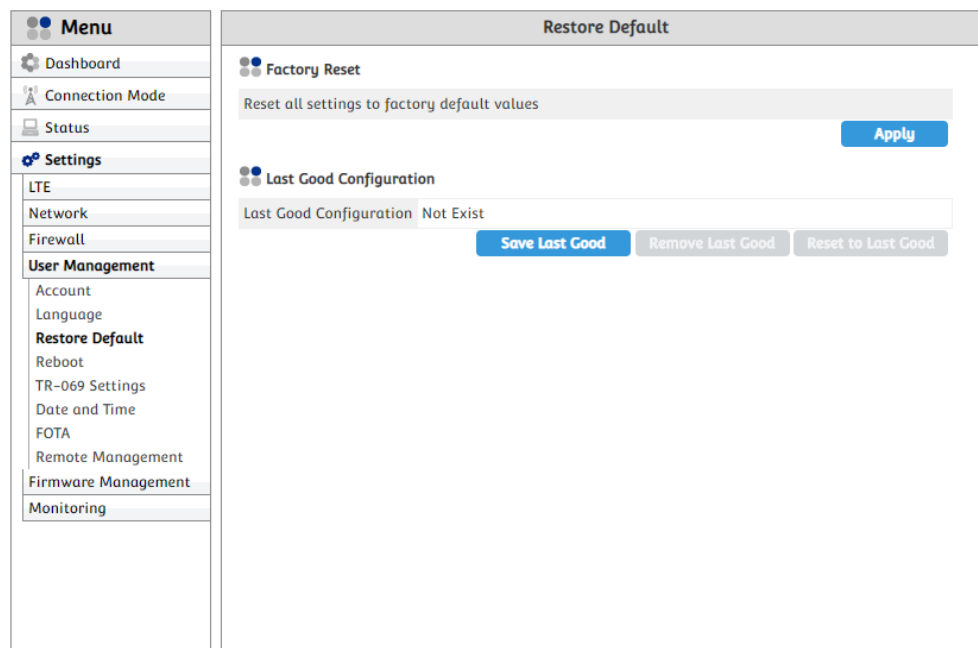
- If you want to change ID (account name), then select one of “Privilege” option, input “Username” and “Current Password”, and “Apply”.
- If you want to change Password, then selection one of “Privilege” option, input “Current Password” and “New Password / Confirm Password” to be changed, and “Apply”.

### 3.4.4.2. Language

The screenshot displays the SEOWONINTECH web interface. On the left is a vertical 'Menu' sidebar with the following items: Dashboard, Connection Mode, Status, Settings (highlighted), LTE, Network, Firewall, User Management (with sub-items: Account, Language, Restore Default, Reboot, TR-069 Settings, Date and Time, FOTA, Remote Management), Firmware Management, and Monitoring. The main content area is titled 'Language' and contains 'Language Settings'. It features a 'Language' label, a dropdown menu currently set to 'English', and an 'Apply' button.

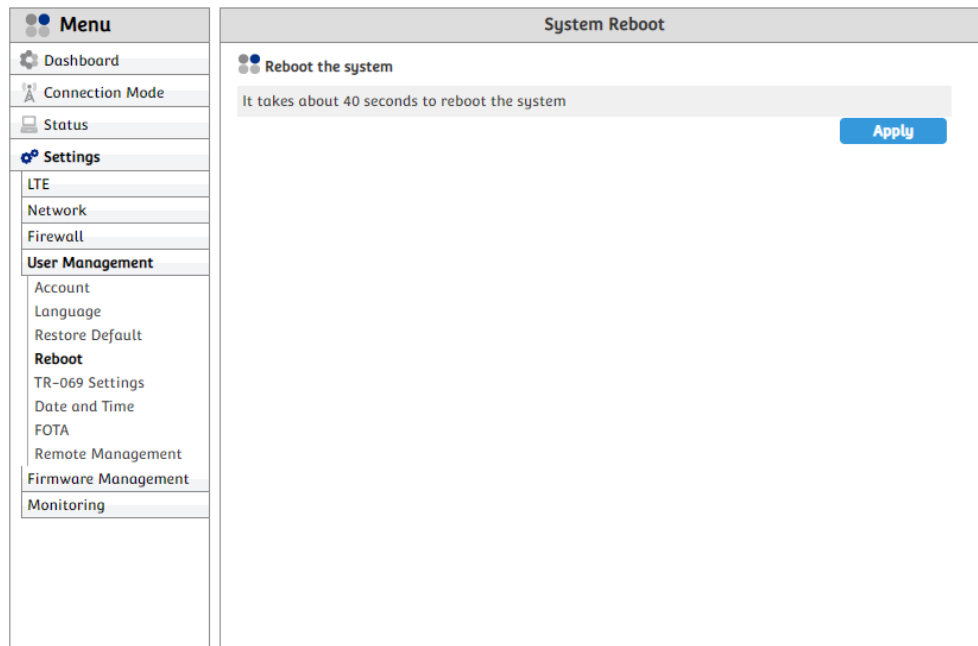
- Select “Language” needed and click “Apply button”.

### 3.4.4.3. Restore Default



- “Factory Reset” ->“Apply” will reset all the configurations changed by a user, to default values.
- If a user wants to save a configuration at a certain time, he/she can save it by click “Save Last Good” in “Last Good Configuration” menu. Even though some configurations are changed after that, a user can back to that point by click “Reset to Last Good”. If a user wants to delete it, then click “Remove Last Good”.

#### 3.4.4.4. Reboot



- You can reboot the CPE by click “Apply button” in the System Reboot menu.

### 3.4.4.5. TR-069 Settings

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings
  - LTE
  - Network
  - Firewall
  - User Management
    - Account
    - Language
    - Restore Default
    - Reboot
    - TR-069 Settings**
    - Date and Time
    - FOTA
    - Remote Management
    - Firmware Management
    - Monitoring

**TR-069 Settings**

CPE WAN Management Protocol(CWMP). It provides the communication between CPE and Auto Configuration Servers(ACS).

**TR-069 Settings**

TR-069 ☐ Enable ☒ Disable

Periodic Inform ☒ Enable ☐ Disable

Periodical Inform Interval

ACS Address

Username

Password

Connection Request Username

Connection Request Password

**Apply**

- Click the “Enable” button in the “TR-069” field to use TR-069 feature, or click the “Disable” button to disable it.
- Click the “Enable” button in the “Periodic Inform” field to enable Periodic Inform so it informs the user periodically about the connection setup, or click the “Disable” button to disable it.
- In the “Periodic Inform Interval” field, enter the time in seconds when the CPE reconnects to ACS periodically.
- In the “ACS Address” field, enter the ACS URL provided by the ISP with the format of “http://”
- In the “Username” field, enter the ACS username provided by the ISP.
- In the “Password” field, enter the password associated with the username.
- Enter the connection request username for the ACS to initiate the connection in the “Connection Request Username” field. This acts as the username for the ACS when a connection is initiated and the user is asked for security credentials.
- Enter the connection request password for the ACS in the “Connection Request Password” field. This acts as the password for the ACS when a connection is initiated and the user is asked for security credentials.
- Click "Apply" button to changes new configuration. Then CPE will be rebooted.

### 3.4.4.6. Date and Time

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings**
- LTE
- Network
- Firewall
- User Management**
- Account
- Language
- Restore Default
- Reboot
- TR-069 Settings
- Date and Time**
- FOTA
- Remote Management
- Firmware Management
- Monitoring

**Date and Time**

**Time Zone Setup**

NTP Client: ☒ Enable ☐ Disable

Local Time: 2015-01-01 14:10:24

Time Server:

Time Zone Select:

Enable Daylight Saving: ☐

Start Date:   of  at  o'clock

End Date:   of  at  o'clock

- If “NTP Client” enables and “Time Server” / “Time Zone Select” are properly configured, current time will be displayed in the “Local Time” menu.
- You can apply Daylight Saving time by checking “Enable Daylight Saving” and setting “Start Date” and “End Date”.

### 3.4.4.7. FOTA

**Menu**

- Dashboard
- Connection Mode
- Status
- Settings**
- LTE
- Network
- Firewall
- User Management**
- Account
- Language
- Restore Default
- Reboot
- TR-069 Settings
- Date and Time
- FOTA**
- Remote Management
- Firmware Management
- Monitoring

**FOTA Setup**

If you setup this function, Firmware will be updated automatically.

**FOTA Setup**

☐ Never check for updates  
☐ Check for update at device booting  
☒ In the upgrade cycle

FOTA periodic timer: Start / End: 00 To 24 hours, Period: 1 day

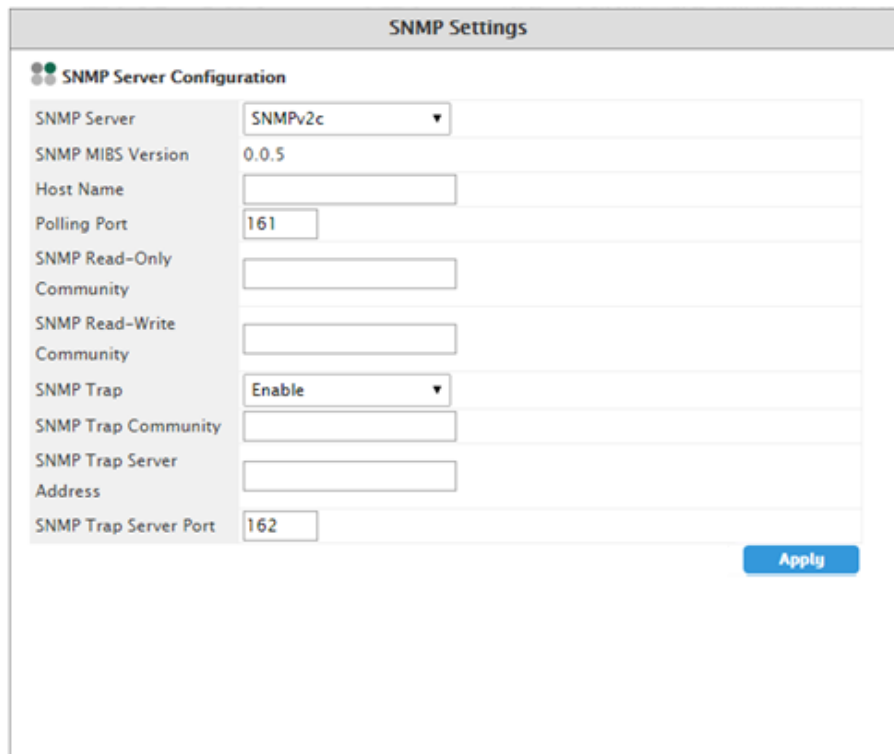
FOTA randomization timer: 15 minutes

Update Server URL:

Check URL:

- If “Never check for updates” is checked, FOTA (Firmware Over The Air) will not check its latest firmware on the FOTA server.
- If “Check for updates at device booting” is checked, FOTA will check “Update Server URL” and try to update every time CPE is boot-up.
- If “In the upgrade cycle” is checked, FOTA will check “Update Server URL” at the time set of the menu “FOTA periodic timer” and “FOTA randomization timer”.
  - ✓ Select a start time, end time, and period and start time must be less than end time.
  - ✓ FOTA periodic timer will be start when current time is between start and end time and start over after selected time period.
- Click “Check URL” ->“Check FOTA server” will bring immediate check for FOTA server.

#### 3.4.4.8. SNMP



The image shows a web-based configuration window titled "SNMP Settings". Inside, there is a section labeled "SNMP Server Configuration" with a list of settings. The settings are as follows:

| Setting                   | Value   |
|---------------------------|---------|
| SNMP Server               | SNMPv2c |
| SNMP MIBS Version         | 0.0.5   |
| Host Name                 |         |
| Polling Port              | 161     |
| SNMP Read-Only Community  |         |
| SNMP Read-Write Community |         |
| SNMP Trap                 | Enable  |
| SNMP Trap Community       |         |
| SNMP Trap Server Address  |         |
| SNMP Trap Server Port     | 162     |

An "Apply" button is located at the bottom right of the configuration area.

- Select "SNMPv2c" or "SNMPv3c" for using SNMP function.
- SNMP MIBS Version : It shows version of current SNMP MIBS.
- Host Name : Enter Host name.
- Polling Port : Enter Polling Port number. (Default value is 161)
- SNMP Read-Only Community : Enter community string for read only.
- SNMP Read-Write Community : Enter community string for read and write.
- SNMP Trap : Select "Enable" for using SNMP Trap function.
- SNMP Trap Community : Enter community string for SNMP Trap.
- SNMP Trap Server Address : Enter Server Address for SNMP Trap.
- SNMP Trap Server Port : Enter Trap Server Port number. (Default value is 161)

### 3.4.4.9. Remote Management

The screenshot shows a web interface for configuring Remote Management. On the left is a 'Menu' sidebar with options: Dashboard, Connection Mode, Status, Settings, LTE, Network, Firewall, User Management (Account, Language, Restore Default, Reboot, TR-069 Settings, Date and Time, FOTA), Remote Management (highlighted), Firmware Management, Monitoring, and Engineer. The main area is titled 'Remote Management' and contains two sections: 'HTTP Server' and 'HTTPS Server'. The 'HTTP Server' section has a 'Remote IP Address' text box and a 'Port Number' dropdown menu set to '80' with a note '(The default is 80)'. The 'HTTPS Server' section has an 'Enable' checkbox (unchecked) and a 'Port Number' dropdown menu set to '443' with a note '(The default is 443)'. An 'Apply' button is located at the bottom right of the configuration area.

- By default, all devices that connected to CPE can access to CPE's management web page. But by using "Remote Management", you can limit only one device to manage the CPE.
- Input IP address and Port number of the connected device.
- You can use this function though HTTPS server by checking "HTTPS Server Enable" option.

### 3.4.5. Firmware Management

#### 3.4.5.1. Software

Software

Software Upgrade

Filename 1

Choose File

No file chosen

Filename 2

Choose File

No file chosen

Filename 3

Choose File

No file chosen

Filename 4

Choose File

No file chosen

Status

Please select the update package file

Device Software Version

1.0.3

Update

Configuration Backup

Configuration Export

Export

Configuration Import

Choose File

No file chosen

Import

- For software upgrade, you need to click “Choose File”, select firmware binary file and click “Update button”. New software will be applied after re-boot of CPE.
- You can extract all configurations that currently applied by click “Export button” in “Configuration Export” menu, to compressed file.
- If you want to apply ‘exported configuration file’ to CPE, then click “Choose File” in the “Configuration Import” menu, select ‘exported file’, and click “Import button”.

### 3.4.6. Monitoring

#### 3.4.6.1. Iperf

The screenshot displays a web-based interface for the Performance Measurement Tool. On the left is a vertical menu with the following items: Menu, Dashboard, Connection Mode, Status, Settings, LTE, Network, Firewall, User Management, Firmware Management, Monitoring, Iperf, Diagnostic, Log, and Engineer. The 'Monitoring' section is expanded, showing 'Iperf' as the selected option. The main content area is titled 'Performance Measurement Tool' and contains the 'Iperf Settings' form. This form includes a 'Status' section with 'Start' and 'Stop' radio buttons, where 'Stop' is selected. Below this are fields for 'Last Measurement Date/Time', 'Server Address', 'Server Port' (set to 5001), 'Measurement Time' (set to 60) with a 'secs' unit, 'Protocol Type' (set to TCP), and 'Number of parallel client' (set to 1). A large, empty rectangular box is provided for the measurement results. At the bottom right of the form are two buttons: 'Refresh' and 'Execute'.

- Input all the items and check “Enable” in the status menu. If you click “Apply button”, then speed with connected Iperf server device will be displayed in the result box, and “Last Measurement Date/Time” will also be updated.
- If you want to see the result again, then click “Refresh button”.

### 3.4.6.2. Diagnostic

The screenshot shows a web-based network management interface. On the left is a 'Menu' sidebar with options: Dashboard, Connection Mode, Status, Settings, LTE, Network, Firewall, User Management, Firmware Management, Monitoring, Iperf, Diagnostic (highlighted), Log, and Engineer. The main area is titled 'Diagnostic' and contains two tabs: 'Ping' (active) and 'Trace router'. The 'Ping' tab has a sub-header 'Ping' and four input fields: 'IP Address (URL)' with the value '8.8.8.8', 'Ping Packet Size (Bytes)' with '56', 'Ping Timeout (sec)' with '30', and 'Ping Count' with a dropdown menu showing '4'. Below these fields is a large text area displaying the results of a ping test to 8.8.8.8, showing four successful pings with varying response times. At the bottom right of the text area is an 'Apply' button.

| Field                    | Value   |
|--------------------------|---------|
| IP Address (URL)         | 8.8.8.8 |
| Ping Packet Size (Bytes) | 56      |
| Ping Timeout (sec)       | 30      |
| Ping Count               | 4       |

PING 8.8.8.8 (8.8.8.8): 56 data bytes  
64 bytes from 8.8.8.8: seq=0 ttl=115 time=73.088 ms  
64 bytes from 8.8.8.8: seq=1 ttl=115 time=81.267 ms  
64 bytes from 8.8.8.8: seq=2 ttl=115 time=91.272 ms  
64 bytes from 8.8.8.8: seq=3 ttl=115 time=81.486 ms

--- 8.8.8.8 ping statistics ---  
4 packets transmitted, 4 packets received, 0% packet loss  
round-trip min/avg/max = 73.088/81.778/91.272 ms

Apply

- Input IP address to test, Ping Packet Size, Ping Timeout, Ping Count and click “Apply button” for starting Ping test.

Menu

Dashboard
Connection Mode
Status
Settings
LTE
Network
Firewall
User Management
Firmware Management
Monitoring
Iperf
Diagnostic
Log

Diagnostic

Ping
Trace router

Trace router

IP Address (URL)
Set Maximum TTL(Max Hops) (Max Hops)
Set the number of queries at each TTL
Report IP Address Only

30

3

☐

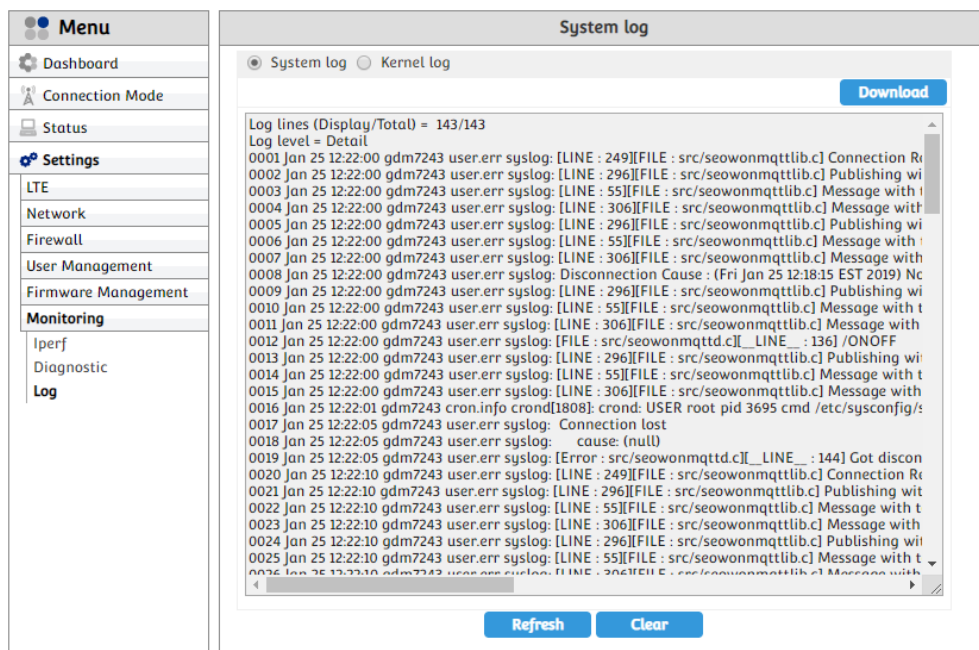
Apply

- Input IP address to trace.
- Input “Set Maximum TTL (Time To Live)”, “Set the number of queries at each TTL”. Those values are used for trace test and will be displayed in the result box
- If “Report IP Address Only” is checked, the result box will only show IP address data.

### 3.4.6.3. Log

The screenshot shows a web interface for configuring system logs. On the left is a 'Menu' sidebar with options: Dashboard, Connection Mode, Status, Settings, LTE, Network, Firewall, User Management, Firmware Management, Monitoring, Iperf, Diagnostic, and Log. The main area is titled 'System log' and contains two sections. The first section, 'System log Enable/Disable', has radio buttons for 'Disable' and 'Enable' (which is selected), and an 'Apply' button. The second section, 'View System Log', has radio buttons for 'System log' and 'Kernel log' (which is selected), and a 'Download' button. Below these are radio buttons for 'Detailed' (selected) and 'Simple'. A note states: 'Note: It could take a longer time to display detailed log'. The log content area is currently empty.

- System log will be displayed in case that “System log” is enabled, “System log” is checked in “View System log” menu, and user clicks “Refresh button” at the bottom of the page. “Clear button” will clear the system log displayed.
- You can download kernel log by click “Download button”



- Kernel log will be displayed in case that “System log” is enabled, “Kernel log” is checked in the “View System log” menu, and user clicks “Refresh button” at the bottom of the page log. Two options are available - Detailed and Simple. “Clear button” will clear the system log displayed.
- You can download kernel log by click “Download button”

## 4. The default setting for the SLC-1200GA CPE.

The table below shows the default settings of the SLC-1200GA CPE and can be changed by the installer.

Meaning of "Items requiring reset"

O : Parameters Applied After CPE Reset

X : Parameters that do not require a CPE reset

- : Parameter showing set value

| Menu     |     | Item                                                     | Default Value View         | Items requiring reset                                                  |
|----------|-----|----------------------------------------------------------|----------------------------|------------------------------------------------------------------------|
| Settings | LTE | Basic<br>(Only engineer account can be modified)         | MMO Mode                   | Downlink MMO Mode<br>2-Layer (2-Layer/4-Layer)<br>O                    |
|          |     |                                                          | Uplink CA Mode             | Enable (enable/ Disable)<br>O                                          |
|          |     |                                                          | Internal DM                | Disable (enable/ Disable)<br>O                                         |
|          |     |                                                          | Additional Commands        | External DM<br>Enable (enable/ Disable)<br>O                           |
|          |     |                                                          | UE Mode                    | Mode<br>PS mode 2<br>O                                                 |
|          |     |                                                          | EMM Timer                  | T3402<br>12 / 1 minute<br>O                                            |
|          |     |                                                          | PSM Timer                  | T3411<br>5 / 2 seconds<br>O                                            |
|          |     |                                                          | Mode                       | Disable (enable/ Disable)<br>O                                         |
|          |     |                                                          | T3324                      | 5 / 2 seconds<br>O                                                     |
|          |     |                                                          | T3412                      | 1 / 10 hours<br>O                                                      |
|          |     | Cell Selection                                           | Full Band                  | Full Band (Full Band / Frequency)<br>O                                 |
|          |     |                                                          | Status                     | 42.43.48<br>-                                                          |
|          |     |                                                          | Band Selection             | Band-42 (Checked) Band-43 (Checked) Band-48 (Checked)<br>O             |
|          |     |                                                          | PLMN Selection             | Auto (Auto / Manual / From USIM)<br>O                                  |
|          |     | Cell Lock                                                | Search Cell                | -<br>O                                                                 |
|          |     |                                                          | Cell Lock List             | -<br>O                                                                 |
|          |     | SIM Management                                           | SIM Card Restriction       | Unchecked<br>O                                                         |
|          |     |                                                          | IMS Prefix                 | -<br>O                                                                 |
|          |     | Default PDN                                              | APN Name                   | -<br>O                                                                 |
|          |     |                                                          | Authentication Type        | NONE<br>O                                                              |
|          |     | Multiple PDN                                             | PDN Type                   | IPv4v6 (IPv4 Only / IPv6 Only / IPv4v6)<br>O                           |
|          |     |                                                          | PDN cid                    | 2<br>O                                                                 |
|          |     |                                                          | APN Name                   | -<br>O                                                                 |
|          |     |                                                          | Authentication Type        | NONE<br>O                                                              |
|          |     |                                                          | PDN Type                   | IPv4v6 (IPv4 Only / IPv6 Only / IPv4v6)<br>O                           |
|          |     |                                                          | Enable                     | Unchecked<br>O                                                         |
|          |     | Internet MTU                                             | Internet MTU Settings      | 1500<br>O                                                              |
|          |     |                                                          | IPv6 Enable                | Enable (Enable / Disable)<br>O                                         |
|          |     | IPv6 Settings                                            | DHCPv6 Address Settings    | DHCPv6 Autoconfiguration Mode<br>Stateless (Stateless / Stateful)<br>O |
|          |     |                                                          | CBSD Enable                | Enable (Enable / Disable)<br>X                                         |
|          |     | CBSD Settings<br>(Only engineer account can be modified) | Enable                     | Select Category<br>Category B (EUD / Category A / Category B)<br>X     |
|          |     |                                                          | CPI Enable                 | Disable (Enable / Disable)<br>X                                        |
|          |     |                                                          | Sas URL                    | https://developer.s-c-02.federatedwireless.com/v1.2/<br>X              |
|          |     |                                                          | Cert                       | etc/ssl/certs/TS.pem<br>X                                              |
|          |     |                                                          | User ID                    | IQmaM<br>X                                                             |
|          |     |                                                          | F ID                       | V7MESL.C-120T420GA<br>X                                                |
|          |     |                                                          | Category                   | B<br>X                                                                 |
|          |     |                                                          | SupportedSpec              | FFS<br>X                                                               |
|          |     |                                                          | Longitude                  | -105<br>X                                                              |
|          |     |                                                          | HeightType                 | agl<br>X                                                               |
|          |     |                                                          | Vertical                   | 1.0<br>X                                                               |
|          |     |                                                          | Antazimuth                 | 359<br>X                                                               |
|          |     |                                                          | Antgain                    | 6<br>X                                                                 |
|          |     |                                                          | Antbeamwidth               | 65<br>X                                                                |
|          |     |                                                          | Meascapability             | -<br>X                                                                 |
|          |     |                                                          | Cert Password              | 123abcdelfg<br>X                                                       |
|          |     |                                                          | Call Sign                  | callSign123<br>X                                                       |
|          |     |                                                          | Radiotech                  | E_UTRA<br>X                                                            |
|          |     |                                                          | Latitude                   | 39<br>X                                                                |
|          |     |                                                          | Height                     | 8.0<br>X                                                               |
|          |     |                                                          | Horizontal                 | 1.0<br>X                                                               |
|          |     |                                                          | Indoor                     | false<br>X                                                             |
|          |     |                                                          | Antdowntilt                | 2<br>X                                                                 |
|          |     |                                                          | Eirpcapability             | 30<br>X                                                                |
|          |     |                                                          | Antmodel                   | antennaModel123<br>X                                                   |
|          |     |                                                          | Meascapability2            | -<br>X                                                                 |
|          |     | Spectrum Inquiry                                         | Inquired Low Freq          | 3500000000<br>X                                                        |
|          |     |                                                          | Inquired High Freq         | 3700000000<br>X                                                        |
|          |     | Grant                                                    | GRANT AUTO                 | Enable (Enable / Disable)<br>X                                         |
|          |     | Switch                                                   | Switch Mode                | NAT (NAT / Bridge)<br>O                                                |
|          |     |                                                          | Switch Setup               | Enable DHCP Server<br>On<br>O                                          |
|          |     | DHCP Server                                              | Gateway IP Address         | 192.168.1.1<br>O                                                       |
|          |     |                                                          | Gateway Subnet Mask        | 255.255.255.0<br>O                                                     |
|          |     |                                                          | Start IP Address           | 192.168.1.2<br>O                                                       |
|          |     |                                                          | Number of users            | 253<br>O                                                               |
|          |     |                                                          | From ISP                   | Checked<br>O                                                           |
|          |     |                                                          | DHCP Lease Time            | 3600<br>O                                                              |
|          |     |                                                          | Lease Reservation Table    | Empty<br>O                                                             |
|          |     |                                                          | Enable DMZ                 | Disable (enable / Disable)<br>O                                        |
|          |     | DMZ                                                      | Redirect ICMP To The Host  | Disable (enable / Disable)<br>O                                        |
|          |     |                                                          | Exclude Web Server Port    | Enable (enable / Disable)<br>O                                         |
|          |     |                                                          | Private LAN IP Address     | 192.168.1.2<br>O                                                       |
|          |     |                                                          | Name                       | -<br>X                                                                 |
|          |     | Port Forwarding                                          | Protocol                   | Both (BOTH / TCP / UDP)<br>X                                           |
|          |     |                                                          | Start Port                 | -<br>X                                                                 |
|          |     |                                                          | End Port                   | -<br>X                                                                 |
|          |     |                                                          | Destination IP             | -<br>X                                                                 |
|          |     |                                                          | Destination Port           | -<br>X                                                                 |
|          |     |                                                          | Port Forwarding List       | -<br>X                                                                 |
|          |     | Port Triggering                                          | Name                       | -<br>X                                                                 |
|          |     |                                                          | Port Type                  | RANGE (RANGE / SINGLE)<br>X                                            |
|          |     |                                                          | Trigger Protocol           | ALL (ALL / TCP / UDP)<br>X                                             |
|          |     |                                                          | Trigger Port               | -<br>X                                                                 |
|          |     |                                                          | Open Protocol              | ALL (ALL / TCP / UDP)<br>X                                             |
|          |     |                                                          | Open Port                  | -<br>X                                                                 |
|          |     | VPN Configuration                                        | VPN Configuration Settings | VPN<br>Disable (Disable / GRE / L2TP / PPTP)<br>O                      |
|          |     |                                                          | PPTP Service               | Checked<br>X                                                           |
|          |     | VPN Passthrough                                          | L2TP/IPSEC Service         | Checked<br>X                                                           |
|          |     |                                                          | UPnP                       | Universal Plug & Play<br>UPnP Enable/Disable<br>X                      |
|          |     | QoS                                                      | QoS Setup                  | QoS Enable/Disable<br>Disable (Enable / Disable)<br>O                  |
|          |     | DDNS                                                     | Dynamic DNS                | DDNS Enable<br>Disable (Enable / Disable)<br>X                         |

|                     |                 |                    |                                       |                                    |                                                  |                            |
|---------------------|-----------------|--------------------|---------------------------------------|------------------------------------|--------------------------------------------------|----------------------------|
| Settings            | Firewall        | Basic              | Firewall Setup                        | Firewall Enable/Disable            | Enable (Enable / Disable)                        | X                          |
|                     |                 |                    |                                       | Allow Ping From WAN                | Enable (Enable / Disable)                        | X                          |
|                     |                 |                    |                                       | Allow HTTP login from WAN          | Enable (Enable / Disable)                        | X                          |
|                     |                 |                    |                                       | Allow HTTPS login from WAN         | Disable (Enable / Disable)                       | X                          |
|                     |                 | SIP ALG Settings   | Multicast Filter                      | Disable (Enable / Disable)         | X                                                |                            |
|                     |                 |                    | Enable SIP ALG                        | UnChecked                          | O                                                |                            |
|                     |                 |                    | SIP port                              | 5060                               | O                                                |                            |
|                     |                 |                    | URL Filter Enable                     | Disable (Enable / Disable)         | O                                                |                            |
|                     |                 | Filter Setup       | Filter Setup                          | Select Filter                      | IP Filter (IP Filter / MAC Filter)               | O                          |
|                     |                 |                    |                                       | Access Control Enable              | Disable (Enable / Disable)                       | X                          |
|                     |                 | Access Control     | Access Control                        | Default Access Mode                | Checked Black List                               | X                          |
|                     |                 |                    |                                       | Black List                         |                                                  | -                          |
|                     |                 |                    |                                       | Devices Online                     |                                                  | -                          |
|                     |                 |                    |                                       | Binding Setting                    | IP-MAC Binding Enable                            | Disable (Enable / Disable) |
|                     |                 | IP-MAC Binding     | IP-MAC Binding                        | Bind list                          |                                                  | -                          |
|                     |                 |                    |                                       | ARP List                           |                                                  | -                          |
|                     | Account         | Account Management | Privilege                             | system (system / user)             | X                                                |                            |
|                     |                 |                    | Username                              | system                             | X                                                |                            |
|                     | Language        | Language Setting   | Customer Name                         |                                    | X                                                |                            |
|                     |                 |                    | Language                              | English                            | -                                                |                            |
|                     | Restore Default | Restore Default    | Factory reset                         |                                    | O                                                |                            |
|                     | Reboot          | System Reboot      | Last Good Configuration               |                                    | -                                                |                            |
|                     |                 |                    | Reboot the System                     |                                    | -                                                |                            |
|                     | User Management | TR-069 Settings    | TR-069 Settings                       | TR-069                             | Disable (Enable / Disable)                       | O                          |
|                     |                 |                    |                                       | Periodic Inform                    | Enable (Enable / Disable)                        | O                          |
|                     |                 |                    |                                       | Periodical Inform Interval         | 300                                              | O                          |
|                     |                 |                    |                                       | ACS Address                        | http://acs.seowonitech.co.kr/acsadmin/lcpeserver | O                          |
|                     |                 |                    |                                       | Username                           |                                                  | O                          |
|                     |                 |                    |                                       | Password                           |                                                  | O                          |
|                     |                 |                    |                                       | Connection Request Username        |                                                  | O                          |
|                     |                 |                    |                                       | Connection Request Password        |                                                  | O                          |
|                     |                 |                    |                                       | NTP Client Enable/Disable          | Enable (Enable / Disable)                        | X                          |
|                     |                 |                    |                                       | Local Time                         |                                                  | -                          |
|                     |                 | Date and Time      | Time Zone Setup                       | Time Server                        | us.pool.ntp.org                                  | X                          |
|                     |                 |                    |                                       | Time Zone                          | Eastern Time (US and Canada)                     | X                          |
|                     |                 |                    |                                       | Enable Daylight Saving             | Unchecked                                        | X                          |
|                     |                 |                    |                                       | Start Date                         | First Sunday of April at 2 o'clock               | X                          |
|                     |                 |                    |                                       | End Date                           | Last Sunday of October at 2 o'clock              | X                          |
|                     |                 |                    |                                       | Never check for updates            | Unchecked                                        | O                          |
|                     |                 | FOTA               | FOTA Setup                            | Check for update at device booting | Unchecked                                        | O                          |
|                     |                 |                    |                                       | In the upgrade cycle               | Checked                                          | O                          |
|                     |                 |                    |                                       | FOTA periodic timer Start / End    | 00 to 24                                         | O                          |
|                     |                 |                    |                                       | FOTA periodic timer Periodic       | 1 day                                            | O                          |
|                     |                 |                    |                                       | FOTA randomization timer           | 15 minutes                                       | O                          |
|                     |                 |                    |                                       | Update Server URL                  | http://61.83.223.242/TE/SEOWON/ODU               | O                          |
|                     |                 |                    |                                       | Check URL                          |                                                  | -                          |
| Remote IP Address   |                 |                    |                                       |                                    | O                                                |                            |
| Remote Management   |                 | HTTP Server        | Port Number                           | 80                                 | O                                                |                            |
|                     |                 |                    | Enable                                | Unchecked                          | O                                                |                            |
| Remote Management   |                 | HTTPS Server       | Port Number                           | 443                                | O                                                |                            |
|                     |                 |                    | Filename 1                            |                                    | -                                                |                            |
| Firmware Management |                 | Software           | Software Update                       |                                    |                                                  |                            |
| Monitoring          |                 | Iperf              | Iperf Settings                        | Status                             | Stop (Start / Stop)                              | -                          |
|                     |                 |                    |                                       | Last Measurement Date/Time         |                                                  | -                          |
|                     |                 |                    |                                       | Server Address                     |                                                  | -                          |
|                     |                 |                    |                                       | Server Port                        | 5001                                             | -                          |
|                     |                 |                    |                                       | Measurement Time                   | 60                                               | -                          |
|                     | Protocol Type   |                    |                                       | TCP (TCP / UDP)                    | -                                                |                            |
|                     | Diagnostic      | Ping               | Number of parallel client             | 1                                  | -                                                |                            |
|                     |                 |                    | IP Address (URL)                      |                                    | -                                                |                            |
|                     |                 |                    | Ping Packet Size (Bytes)              | 56                                 | -                                                |                            |
|                     |                 |                    | Ping Timeout (sec)                    | 30                                 | -                                                |                            |
|                     |                 |                    | Ping Count                            | 4                                  | -                                                |                            |
|                     |                 |                    | IP Address (URL)                      |                                    | -                                                |                            |
|                     | Trace Router    | Trace Router       | Set Maximum TTL(Max Hops) (Max Hops)  | 30                                 | -                                                |                            |
|                     |                 |                    | Set the number of queries at each TTL | 3                                  | -                                                |                            |
|                     |                 |                    | Report IP Address Only                | UnChecked                          | -                                                |                            |
|                     |                 |                    | System log Enable/Disable             | Disable (Enable / Disable)         | O                                                |                            |
|                     | Log             | System log         | Kernel Log (System log / Kernel log)  |                                    | -                                                |                            |
|                     |                 |                    | View System Log                       | Simple (Detailed / Simple)         | -                                                |                            |

## Acronyms

|                |                                                                   |
|----------------|-------------------------------------------------------------------|
| 3GPP           | 3rd Generation Partnership Project                                |
| ACS            | Auto Configuration Servers                                        |
| ALG            | Application Layer Gateway                                         |
| APN            | Access Point Name                                                 |
| ARP            | Address Resolution Protocol                                       |
| CA             | Carrier Aggregation                                               |
| CBRS           | Citizens Broadband Radio Service                                  |
| CBSD           | Citizens Broadband radio Service Device                           |
| CID            | Context Identification (Parameter)                                |
| CM             | Connection Manager                                                |
| CPE            | Customer Premises Equipment <i>or</i> Customer Provided Equipment |
| CPI            | Certified Professional Installer                                  |
| CQI            | Channel Quality Indicator                                         |
| DDNS           | Dynamic DNS(Domain Name System) Service                           |
| DHCP           | Dynamic Host Configuration Protocol                               |
| DMZ            | Demilitarized Zone                                                |
| DNS            | Domain Name System                                                |
| EARFCN         | E-UTRA Absolute Radio Frequency Channel Number                    |
| EIRP           | Effective Isotropic Radiated Power                                |
| EMM            | EPS Mobility Management                                           |
| EPS            | Evolved Packet System                                             |
| EUD            | End User Device                                                   |
| E-UTRA         | Evolved Universal Terrestrial Radio Access                        |
| FOTA           | Firmware Over The Air                                             |
| FTP            | File Transfer Protocol                                            |
| FW             | Firmware                                                          |
| GRE            | Generic Routing Encapsulation                                     |
| HTTP           | Hypertext Transfer Protocol                                       |
| HTTPS          | Hypertext Transfer Protocol over Secure Socket Layer              |
| ICMP           | Internet Control Message Protocol                                 |
| IDENT Protocol | Identification Protocol                                           |
| IMEI           | International Mobile Equipment Identity                           |
| IMS            | IP(Internet Protocol) Multimedia Subsystem                        |
| IMSI           | International Mobile Subscriber Identity                          |
| IPsec          | Internet Protocol Security                                        |
| IPv4           | Internet Protocol version 4                                       |
| IPv6           | Internet Protocol version 6                                       |

|        |                                                 |
|--------|-------------------------------------------------|
| IRC    | Internet Relay Chat                             |
| ISP    | Internet Service Provider                       |
| LAN    | Local Area Network                              |
| LTE    | Long-Term Evolution                             |
| L2TP   | Layer 2 Tunneling Protocol                      |
| MAC    | Media Access Control Address                    |
| MCC    | Mobile Country Code                             |
| MCS    | Modulation Coding Scheme                        |
| MNC    | Mobile Network Code                             |
| MPPE   | Microsoft Point-to-Point Encryption             |
| MTU    | Maximum Transmission Unit                       |
| NAS    | Non-Access Stratum                              |
| NAT    | Network Address Translation                     |
| NTP    | Network Time Protocol                           |
| ODM    | Original Development Manufacturing              |
| OUI    | Organizationally Unique Identifier              |
| PCI    | Physical Cell Identity                          |
| PDN    | Packet Data Network                             |
| PIN    | Personal Identification Number                  |
| PLMN   | Public Land Mobile Network                      |
| PMI    | Precoding Matrix Indicator                      |
| PPTP   | Point-to-Point Tunneling Protocol               |
| PUK    | Personal Unlock Key                             |
| QoS    | Quality of Service                              |
| RRC    | Radio Resource Control                          |
| RSRP   | Reference Signal Received Power                 |
| RSRQ   | Reference Signal Received Quality               |
| RSSI   | Received Signal Strength Indicator              |
| SAS    | Spectrum Access System                          |
| SDK    | Software Development Kit                        |
| SIM    | Subscriber Identity Module                      |
| SINR   | Signal to Interference & Noise Ratio            |
| SIP    | Session Initiation Protocol                     |
| SNMP   | Simple Network Management Protocol              |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| TM     | Transmission Mode                               |
| TR-069 | Technical report 069                            |
| TTL    | Time To Live                                    |
| UDP    | User Datagram Protocol                          |

|      |                                            |
|------|--------------------------------------------|
| UICC | Universal Integrated Circuit Card          |
| UPnP | Universal Plug and Play                    |
| URL  | Uniform Resource Locator                   |
| USIM | Universal Subscriber Identification Module |
| VPN  | Virtual Private Network                    |
| WAN  | Wide Area Network                          |