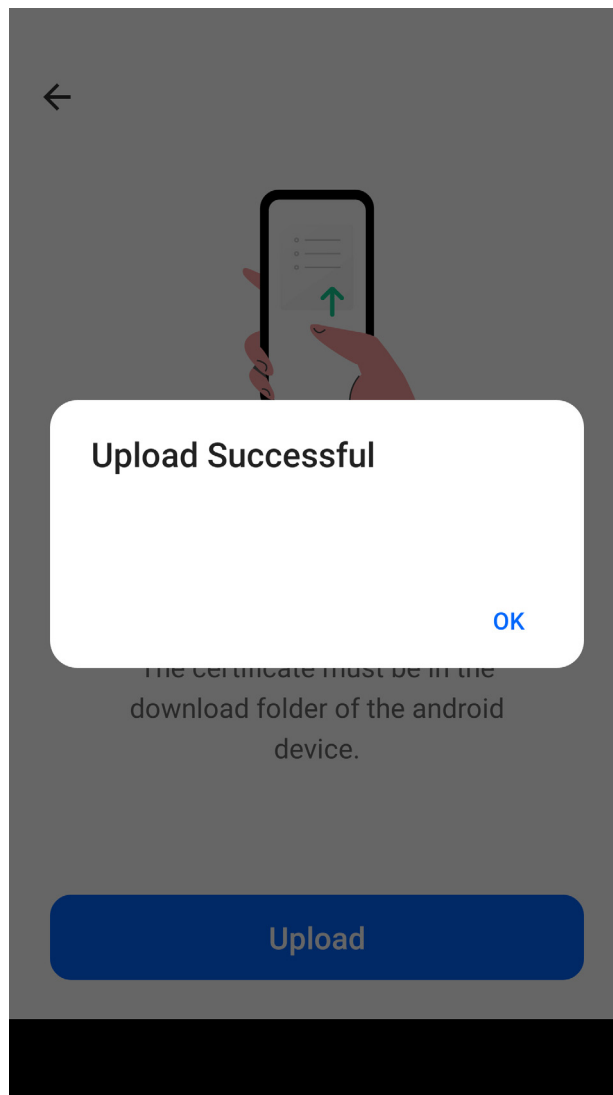


Figure 59 Screen showing that upload of CA certificates was successful for a Nokia FastMile 4G Receiver managed by an ACS through TR-069

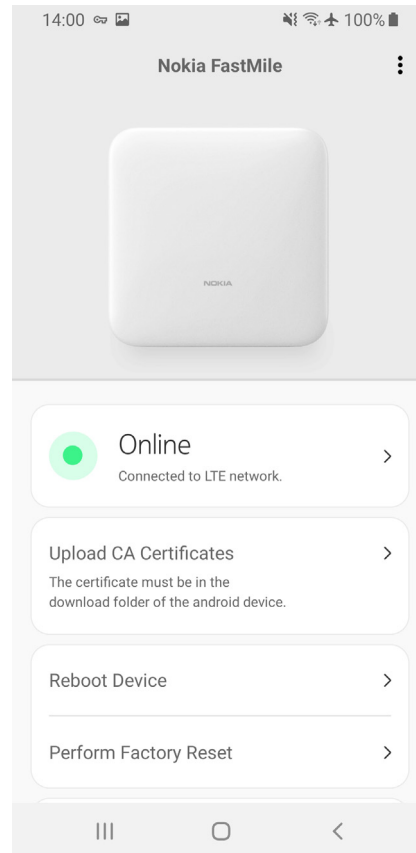


Tap on "Ok" to clear the message.

-
- 10** You can reboot a Nokia FastMile 4G Receiver managed by an ACS through TR-069 by tapping on the "Reboot Device" option.

Figure 60 shows the "Reboot Device" option.

Figure 60 Screen showing the “Reboot Device” option for a Nokia FastMile 4G Receiver managed by an ACS through TR-069



When you reboot the Nokia FastMile 4G Receiver, the screen shows the reboot message indicating that the Bluetooth connection will be interrupted and that you will be disconnected.

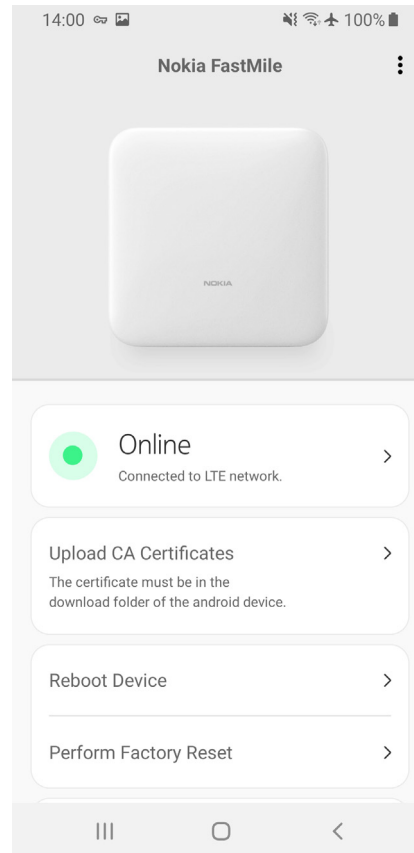
Press the Reboot option if you want to proceed with the reboot, or press the Cancel option.

If you pressed the Reboot option, press OK.

- 11** You can change the configuration settings for a Nokia FastMile 4G Receiver managed by an ACS through TR-069 to the default factory load settings by tapping on the “Perform Factory Reset” option.

Figure 61 shows the “Perform Factory Reset” option.

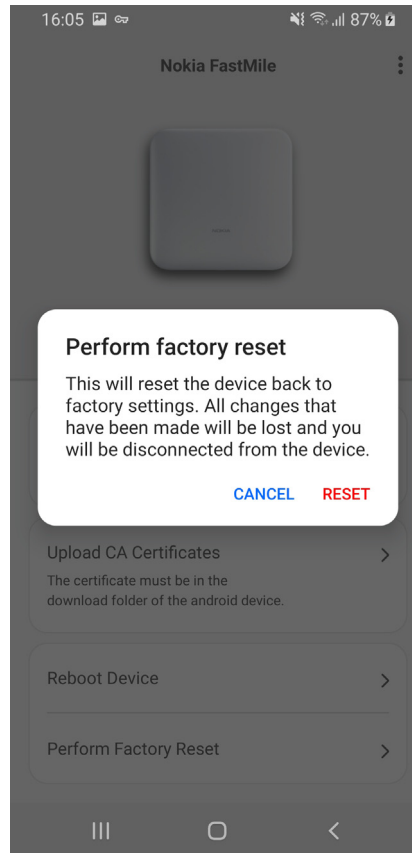
Figure 61 Screen showing the “Perform Factory Reset” option for a Nokia FastMile 4G Receiver managed by ACS through TR-069



The screen shows the factory reset message indicating that the factory reset will reset the device back to factory settings and that all changes will be lost and that you will be disconnected.

Figure 62 shows the screen that has the factory reset message.

Figure 62 Screen showing the factory reset message for a Nokia FastMile 4G Receiver managed by ACS through TR-069



Press the Reset option if you want to proceed with the reset to factory settings, or press the Cancel option.

If you pressed the Reset option, press OK.

14 Management using the Web UI

14.1 Using the Web UI to manage the Nokia FastMile 4G Receiver

14.2 Using the Web UI status screen

14.3 Using the Web UI network screen

14.4 Using the Web UI CBRS screen

14.5 Using the Web UI system screen

14.1 Using the Web UI to manage the Nokia FastMile 4G Receiver

After the Nokia FastMile 4G Receiver has been installed, you can use the Web UI to perform some management-type activities on a Nokia FastMile 4G Receiver that is managed by an ACS through TR-069. See section [6.1.2](#) for more information about the Web UI.

The Web UI provides the following screens to provide support for management of the Nokia FastMile 4G Receiver:



Note — Most of the screens require login. See the Customer Release Notes for Web UI considerations and limitations, including username information for the types of accounts supported by the Web UI.

Default passwords for the accounts will be delivered during commissioning. The default passwords can be set in pre-configuration file (either customers provide it or use default ones from Nokia).

The Web UI passwords can be managed later on through the ACS.

- Status screen: allows viewing of FastMile 4G Receiver status parameter values (login is not required), see section [14.2](#)
- Network screen: allows configuration of specific FastMile 4G Receiver parameters (login is required), see section [14.3](#)
- CBRS screen: offers the possibility to display CBSD parameters of the FastMile 4G Receiver, as well as to input registration information for CPI's usage (login is required), see section [14.4](#)
- System screen: allows performing of advanced system actions (login is required), see section [14.5](#)

14.2 Using the Web UI status screen

The Web UI status screen allows you to view FastMile 4G Receiver status parameters. No login is required.

The following parameters are shown:

- The Cell ID for primary attached cell
- The primary attached cell physical cell ID (PCI), eNodeB ID (eNBID), DL EARFCN and the Band
- The secondary attached cells physical cell ID (PCI) and DL EARFCN
- Secondary Component Carrier Band (Downlink)
- Secondary Component Carrier Band (Uplink)
- The Signal Strength of the attached cell: this animated model shows the RSRP (Reference Signals Received Power) of the attached cell
- The RSRP (Reference Signals Received Power) of the attached primary and secondary cells
- The RSRQ (Reference Signal Received Quality) of the attached primary and secondary cells
- The RSSI (Received Signal Strength Indication) of the attached primary and secondary cells
- The CINR (Carrier to Interference plus Noise Ratio) of the attached primary and secondary cells
- The SINR (Signal to Interference and Noise Ratio) of the attached primary cell
- Total number of MB sent on the LTE interface since last FastMile 4G Receiver restart
- Total number of MB received on the LTE interface since last FastMile 4G Receiver restart
- Total number of MB sent on the Ethernet interface since last FastMile 4G Receiver restart
- Total number of MB received on the Ethernet interface since last FastMile 4G Receiver restart
- Data Model (TR-069)
- Software Version
- Name retrieved from network and the corresponding IP address of the configured Access Points
- Device Info table with information regarding the IMSI, IMEI, Ethernet MAC Address, Serial Number and the Model Name

You can display available cell information by triggering measurements using the “Trigger measurement” button on the Web UI status screen. Available cell information includes: physical cell ID, DL EARFCN, SINR, RSRP, RSRQ, RSSI. Note the following

- up to 12 available cells are shown, ranked from strongest to weakest by RSRP
- After approximately five seconds from triggering of measurements, the FastMile 4G Receiver will detach from the carrier’s network. Push the measurements status refresh button while the FastMile 4G Receiver is detached to see the grayed-out Web UI status screen. Reattachment of the FastMile 4G Receiver may take from several seconds to up to five minutes. You will need to refresh the browser for updated Web UI status screen contents after reattachment of the FastMile 4G Receiver.
- available cell information will not be visible after rebooting the FastMile 4G Receiver

Figure 63 shows an example of the top part of the Status screen when the FastMile 4G Receiver is not connected to a cell.

Figure 63 Example of the top part of the Status screen when the FastMile 4G Receiver is not connected to a cell

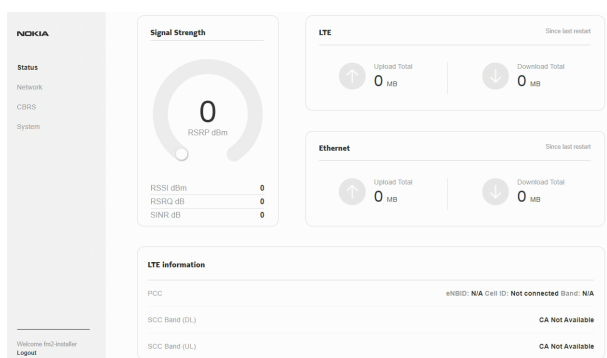


Figure 64 shows the lower part after scrolling down of an example of the Status screen without available cells when the FastMile 4G Receiver is not connected to a cell.

Figure 64 Example of the lower part of the Status screen without available cells when the FastMile 4G Receiver is not connected to a cell

NOKIA

Status

Network

CMS

System

Primary Cell

PCI	eARFCN	Cell Type	RSRP	RSRQ	RSSI	CINR
-----	--------	-----------	------	------	------	------

No Cell available

Secondary Cells

PCI	eARFCN	Cell Type	RSRP	RSRQ	RSSI	CINR
-----	--------	-----------	------	------	------	------

No Cells available

Available cells

Trigger Measurement

2

PCI	eARFCN	RSRP	RSRQ	RSSI	SINR
-----	--------	------	------	------	------

No Cells available

Figure 65 shows the lower part after scrolling down of an example of the Status screen with available cells when the FastMile 4G Receiver is not connected to a cell.

Figure 65 Example of the lower part of the Status screen with available cells when the FastMile 4G Receiver is not connected to a cell

[illegible]

Figure 66 shows the top part of an example of the Status screen when the FastMile 4G Receiver is connected to a cell.

Figure 66 Example of the top part of the Status screen when the FastMile 4G Receiver is connected to a cell

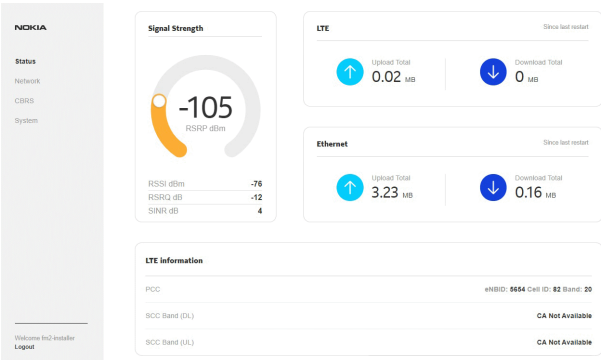
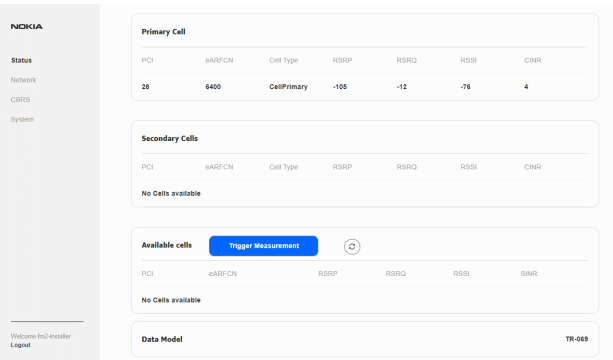


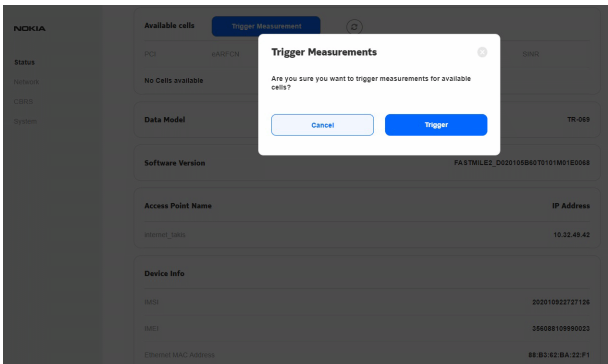
Figure 67 shows a lower part after scrolling down of an example of the Status screen when the FastMile 4G Receiver is connected to a cell. The figure shows the trigger measurement button that can be used to display information about available cells.

Figure 67 Example of a lower part of the Status screen when the FastMile 4G Receiver is connected to a cell



To display available cell information, select the trigger measurement button on the Status screen. Figure 68 shows the pop up window that appears when the trigger measurement button is selected.

Figure 68 Example of the Trigger Measurement pop up window



You can proceed or cancel the trigger measurement action.



Note — After approximately five seconds from triggering of measurements, the FastMile 4G Receiver will detach from the carrier’s network. Push the measurements status refresh button while the FastMile 4G Receiver is detached to see the grayed-out Web UI status screen. Reattachment of the FastMile 4G Receiver may take from several seconds to up to five minutes. You will need to refresh the browser for updated Web UI status screen contents after reattachment of the FastMile 4G Receiver.

The following figures show examples of screens involved in the trigger measurement action:

- Figure 69 shows trigger measurement that is ongoing
- Figure 70 shows trigger measurement that has completed with a list of available cells and the FastMile 4G Receiver is detached from the carrier's network
- Figure 71 shows trigger measurement that has completed and the FastMile 4G Receiver is reattached to the carrier's network

Figure 69 Example of ongoing Trigger Measurement

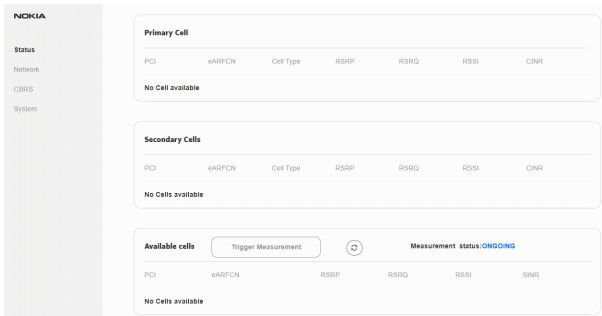


Figure 70 Example of Trigger Measurement completed and FastMile 4G Receiver is detached

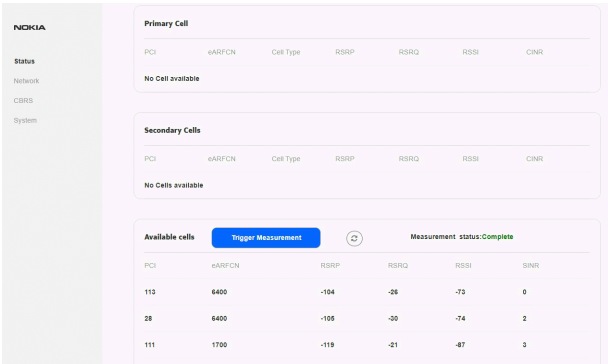


Figure 71 Example of Trigger Measurement completed and FastMile 4G Receiver is reattached

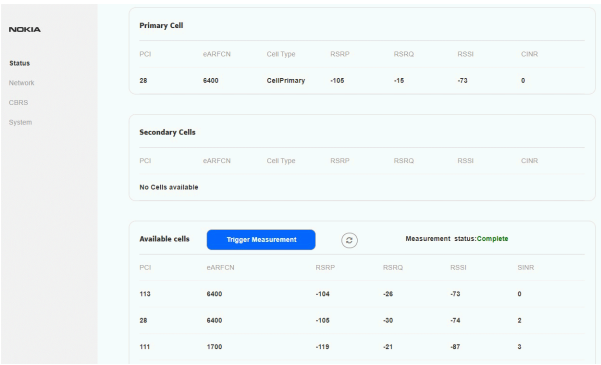
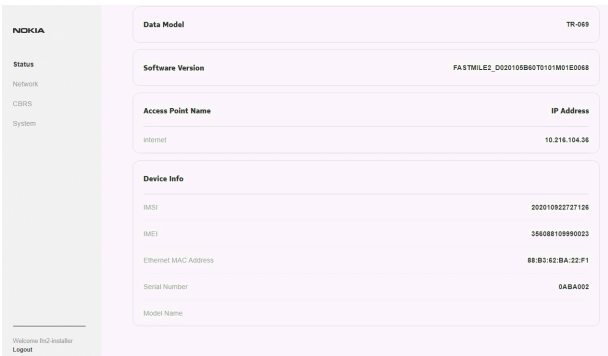


Figure 72 shows the lowest part after scrolling down of an example of the Status screen when the FastMile 4G Receiver is connected to a cell.

Figure 72 Example of the lowest part of the Status screen when the FastMile 4G Receiver is connected to a cell



14.3 Using the Web UI network screen

The Web UI network screen allows you to perform FastMile4G Receiver configuration actions. Login is required. For details on the Web UI login, please refer to the Customer Release Notes.

The following configuration capabilities are supported:

- Configuration of ACS URL
- Configuration of ACS username
- Configuration of ACS password
- Configuration of Connection Request Port
- Configuration of Connection Request Username
- Configuration of Connection Request Password
- Configuration of Periodic Inform Interval
- Configuration of Periodic Inform Request
- Setting of location; that is, geocoordinates (latitude and longitude)
- Configuration of Access Points (up to one default AP in router mode and up to four APs in bridge mode; a total of five APs can be configured). AP configuration includes configuration of:
 - AP name (If the default AP name is set to EmptyAPN, the auto APN feature is enabled)
 - forwarding mode (router or bridge)
 - Username
 - Password
 - Authentication mode
 - VLAN
 - MTU size
 - subnet mask
 - Note that the default AP cannot be deleted
- Configuration of cell list (up to nine cells can be configured)
- Configuration of the DHCP server for router mode
- Uploading of CA certificates



Note — CA certificates must be pre-downloaded to the laptop so that they can be browsed and found via the 'Upload Certificate' action. The CA Certificates must comply to the naming rules required by the FastMile 4G Receiver.

The following CA certificates are supported:

- logserverCA.pem (used for authenticating the log server)
- swserverCA.pem (used for authenticating the software upgrade server)

- diagserverCA.pem (used for authenticating the optional diagnostics server)
- acsCA.pem (used for authenticating the ACS)



Note — Auto refresh of web UI screens is not supported, so it is recommended that you refresh the Web UI network screen to avoid retrieving outdated information if any database changes have been done since the last retrieval of information.

Figure 73 shows an example of the Login screen.

Figure 73 Example of the Login screen

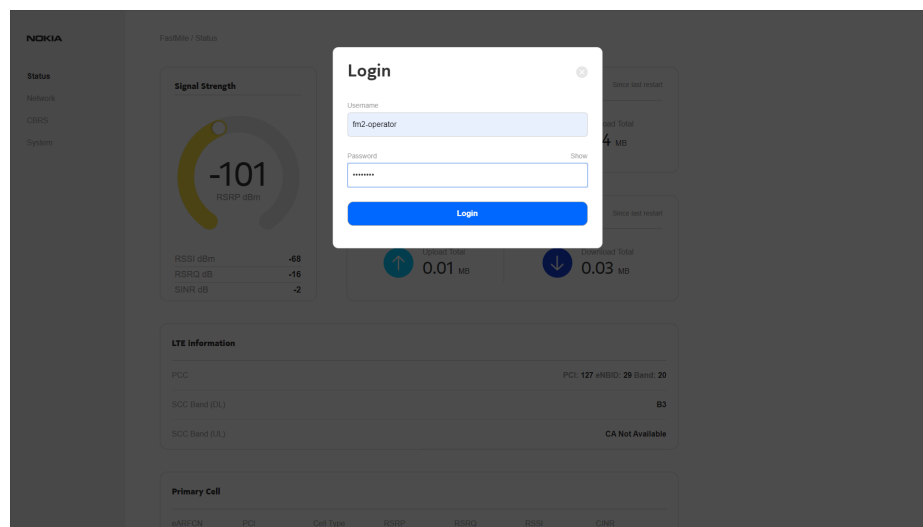


Figure 74 shows an example of the Network screen.

Figure 74 Example of the Network screen

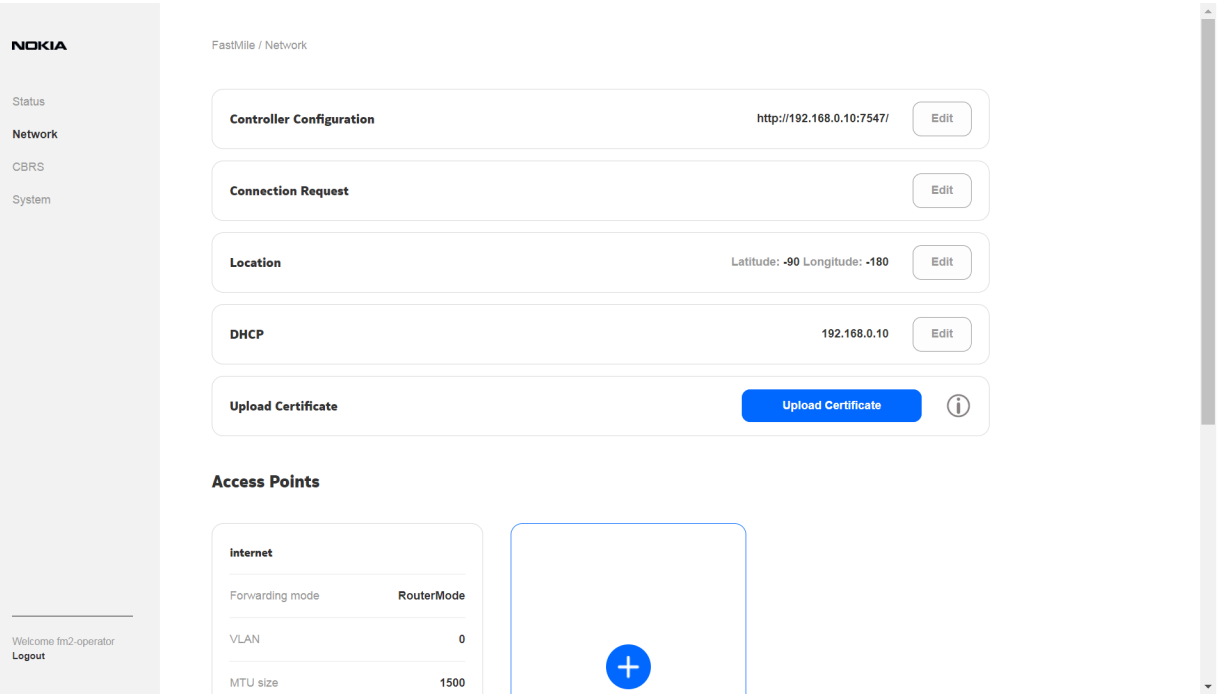


Figure 75 shows an example of scroll down for the Network screen.

Figure 75 Example of scroll down for the Network screen

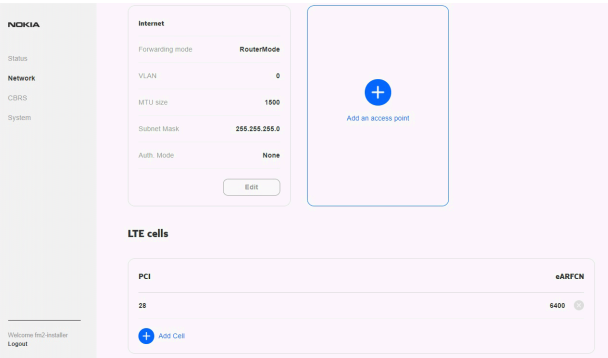


Figure 76 shows an example of the Add Access Point window.

Figure 76 Example of the Add Access Point window

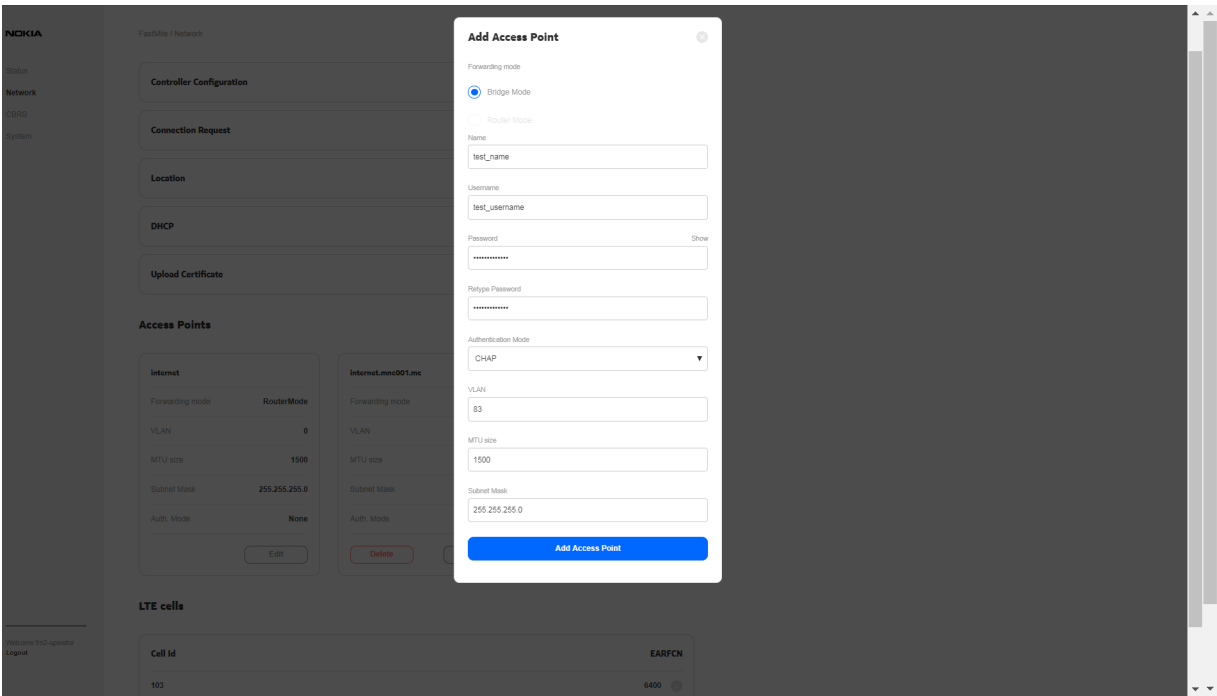


Figure 77 shows an example of the Delete Access Point window

Figure 77 Example of the Delete Access Point window

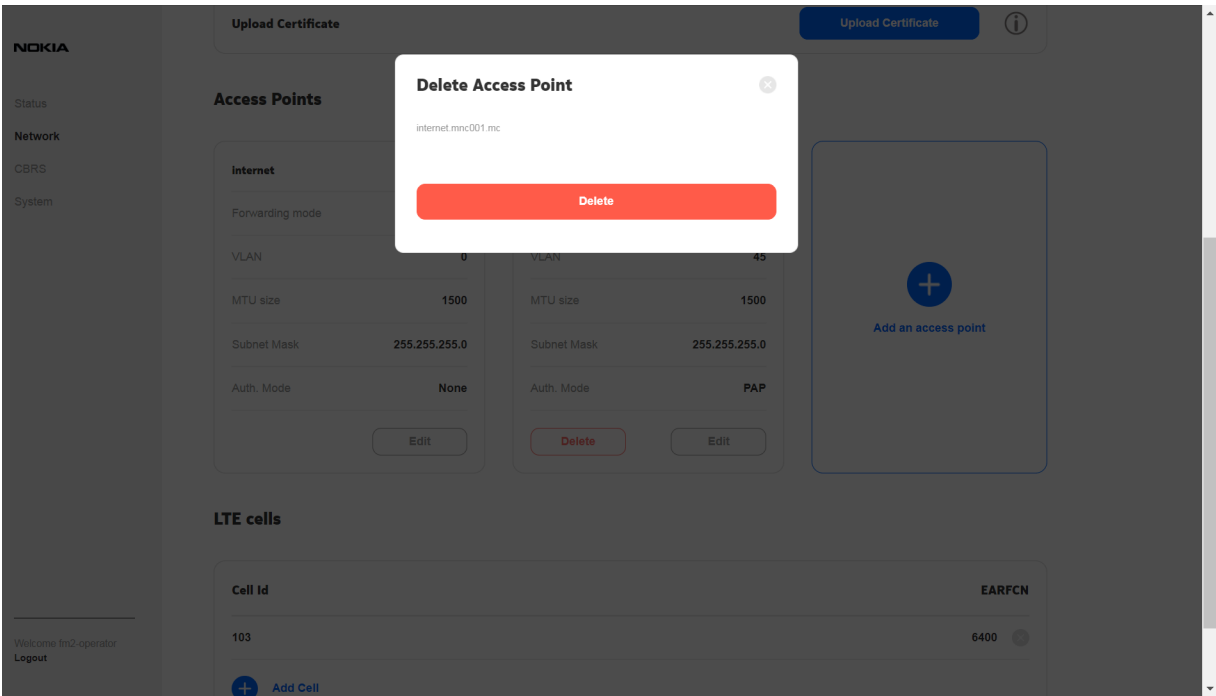


Figure 78 shows an example of the Edit Location window.

Figure 78 Example of the Edit Location window

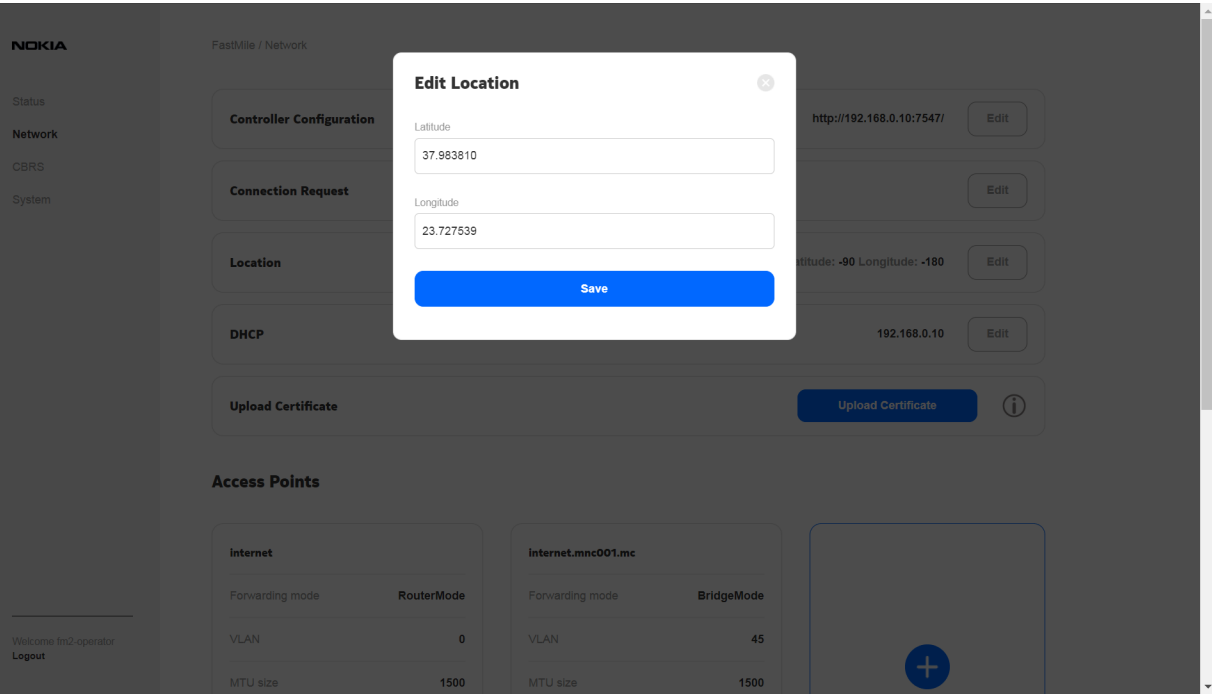


Figure 79 shows an example of the Edit Controller window.

Figure 79 Example of the Edit Controller window

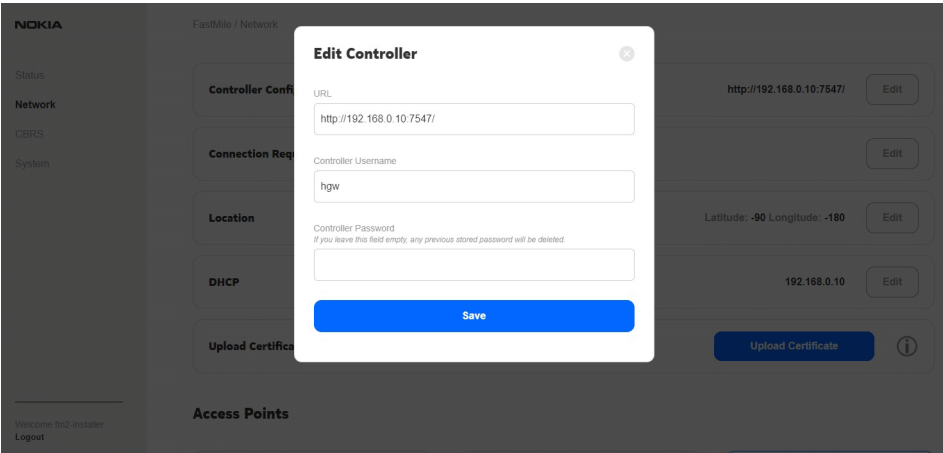


Figure 80 shows an example of the Edit Connection Request window.

Figure 80 Example of the Edit Connection Request window

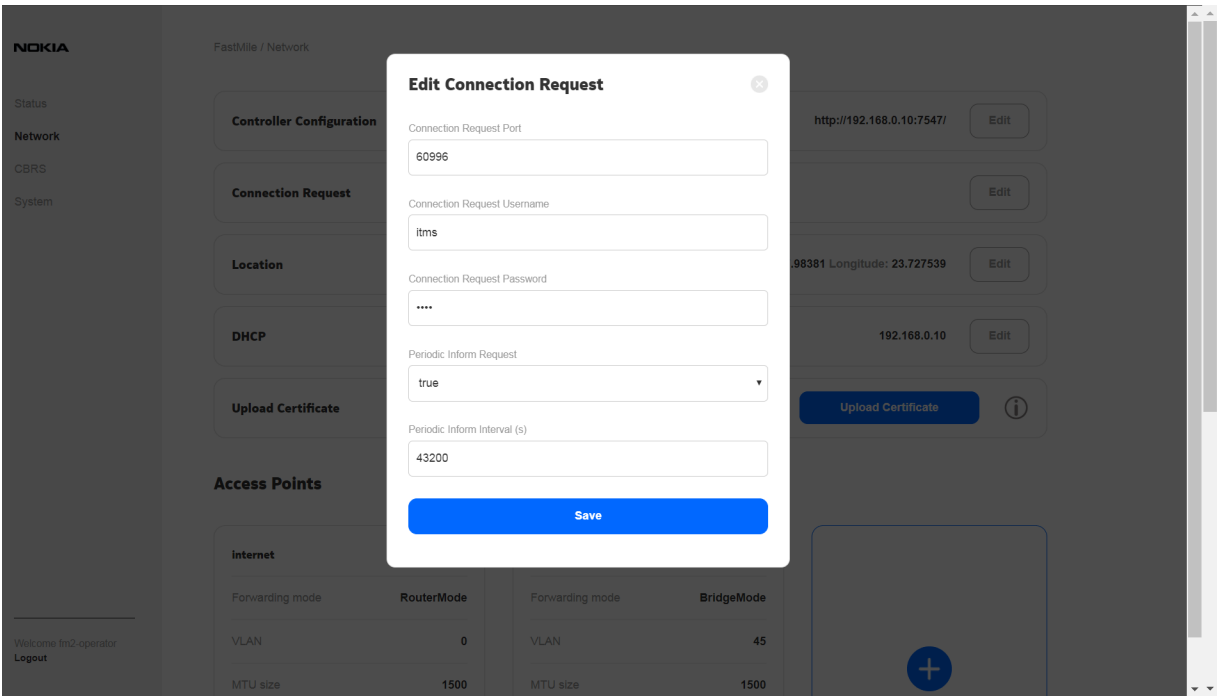


Figure 81 shows an example of the Edit DHCP window.

Figure 81 Example of the Edit DHCP window

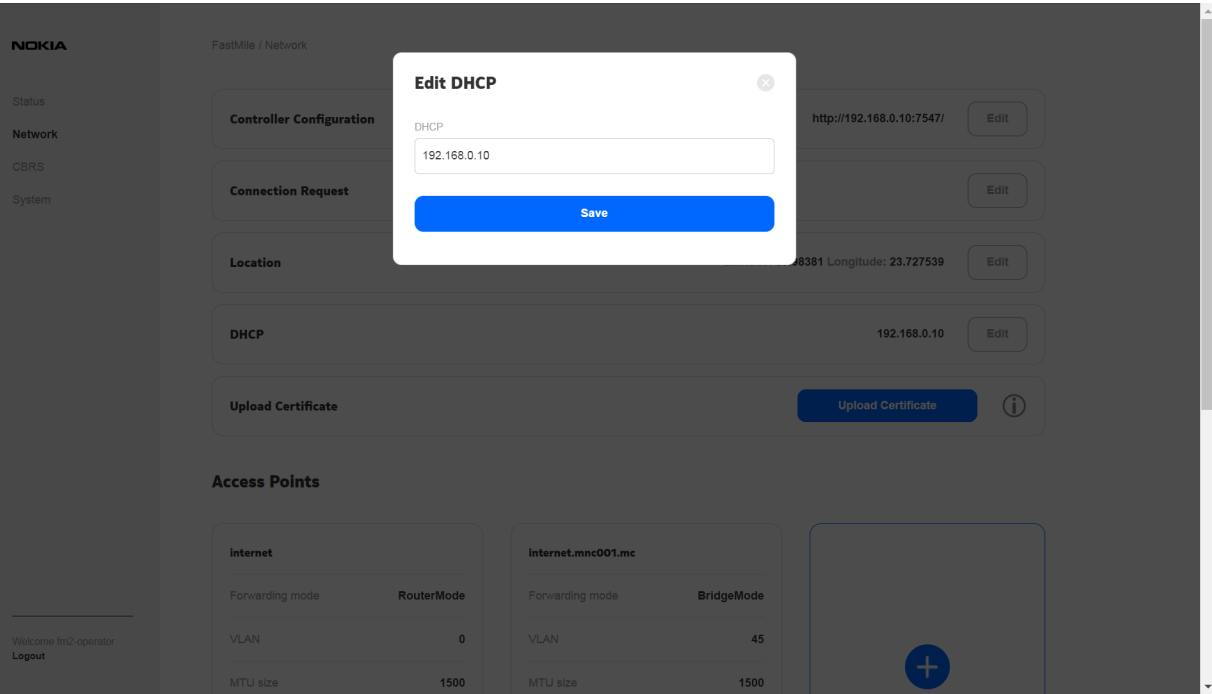


Figure 82 shows an example of the Certificates information window that opens when you click on Upload Certificate.

Figure 82 Example of the Certificates information window

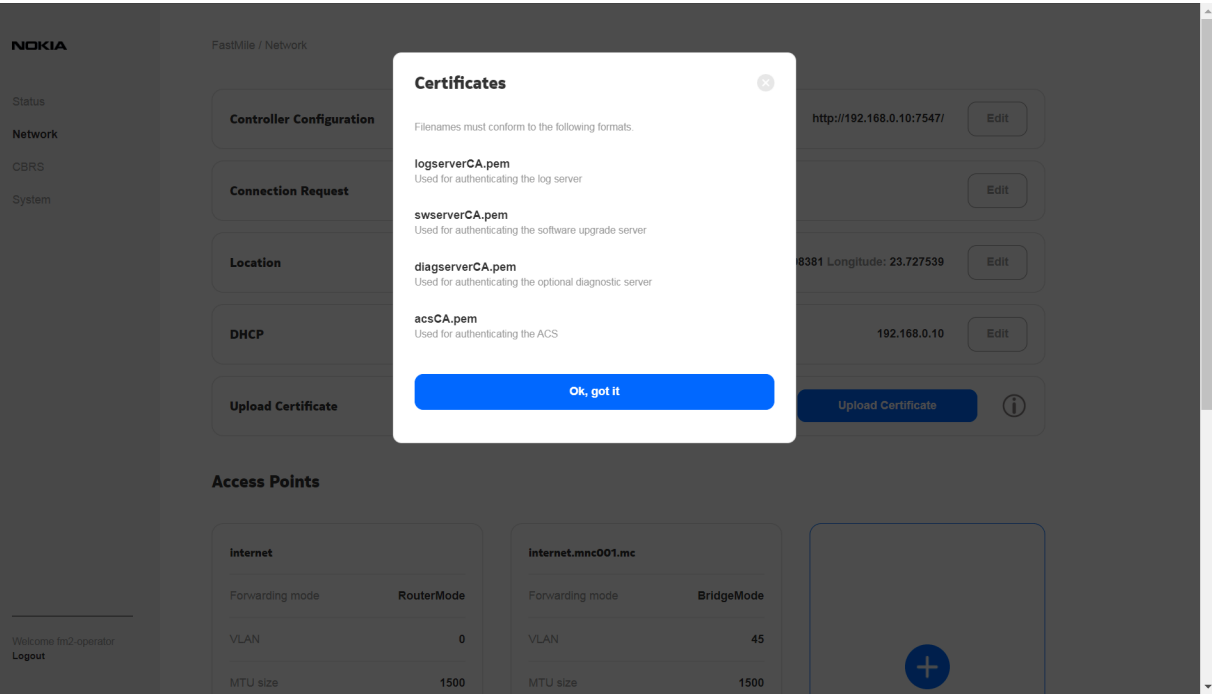


Figure 83 shows an example of the Add Cell window.

Figure 83 Example of the Add Cell window

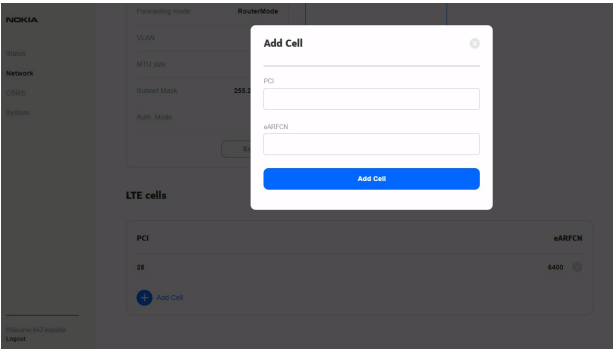
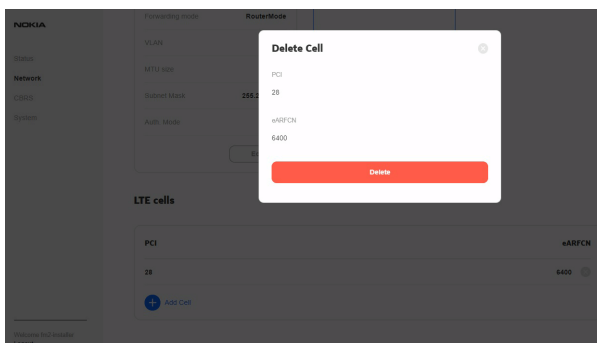


Figure 84 shows an example of the Delete Cell window.

Figure 84 Example of the Delete Cell window

14.4 Using the Web UI CBRS screen

The Web UI CBRS (Citizens Broadband Radio Service) screen is intended for the US market and offers the possibility to display CBSD (Citizens Broadband Radio Service Device) parameters of the FastMile 4G Receiver, as well as to input registration information for CPI's (Certified Professional Installer) usage. Login is required. For details on the Web UI login, please refer to the *Customer Release Notes*.

The Web UI CBRS screen allows you to view the following FastMile 4G Receiver CBSD parameters:

- FCC (Federal Communications Commission) ID
- CBSD (Citizens Broadband Radio Service Device) Category
- Air interface
- Measurement Capability
- CBSD Registration
- CBSD Grant (if applicable; maximum of four):
 - Grant ID
 - Grant Status
 - High Frequency
 - Low Frequency

Additionally, the Web UI CBRS screen allows you to input the following parameters:

- User ID (UR_ID)
- CBRS Root CA file
- CRL (Certificate Revocation List) file
- SAS SERVER
- CRL (Certificate Revocation List) URL list (maximum of five)

Figure 85 and Figure 86 show examples of the Web UI CBRS screen.

Figure 85 Example of the Web UI CBRS screen with no CBSD Grants

The screenshot shows the Nokia FastMile 4G Receiver Web UI. On the left is a sidebar with the Nokia logo and navigation links: Status, Network, CBRS, and System. The main content area is titled 'CBRS' and contains several sections: 'SAS Parameters' with fields for POC ID (242PM0010), CBSD Category (B), Air Interface (E-UTRA), Measurement Capability (RECEIVED_POWER_WITH_GRANT), and CBSD Registration (Unregistered); a table with four columns for Grant ID, Grant Status (all 'IDN'), High Frequency, and Low Frequency; 'UNER ID (URL_ID)' with an 'Edit' button; 'CBRS Root CA File' with an 'Upload CBRS Root CA File' button; 'CRL File' with an 'Upload CRL File' button; 'SAS SERVER' with an 'Edit' button; and 'CRL URL' with a '+ Add CRL URL' button.

Figure 86 Example of the Web UI CBRS screen with three CBSD Grants

This screenshot shows the same Web UI as Figure 85, but with three CBSD Grants. The 'SAS Parameters' section remains the same. The table now has three rows of grant data: Grant ID 11, Grant Status IDN, High Frequency 334, Low Frequency 47; Grant ID 109, Grant Status IDN, High Frequency, Low Frequency; and Grant ID 109, Grant Status IDN, High Frequency, Low Frequency. The 'UNER ID (URL_ID)', 'CBRS Root CA File', 'CRL File', 'SAS SERVER', and 'CRL URL' sections are also present.

14.5 Using the Web UI system screen

The Web UI system screen allows you to perform advanced system actions on the FastMile 4G Receiver. Login is required. For details on the Web UI login, please refer to the *Customer Release Notes*.

The following advanced system capabilities are supported:

- Restart device: the FastMile 4G Receiver configuration remains intact
- Restore factory settings: factory configuration of the FastMile 4G Receiver is used; subsequent configuration is lost
- Upgrade firmware:
 - before doing any firmware upgrade action, make sure that the upgrade path from the existing firmware to new firmware is supported by the FastMile 4G Receiver
 - new image is installed in the FastMile 4G Receiver; the FastMile 4G Receiver configuration remains intact
 - note that the FastMile 4G Receiver will reboot if the firmware upgrade fails
- Enable/disable LAN SSH access (by default LAN SSH access is enabled)
- Enable/disable WAN SSH access (by default WAN SSH access is disabled)

Figure 87 shows an example of the System screen.

Figure 87 Example of the System screen

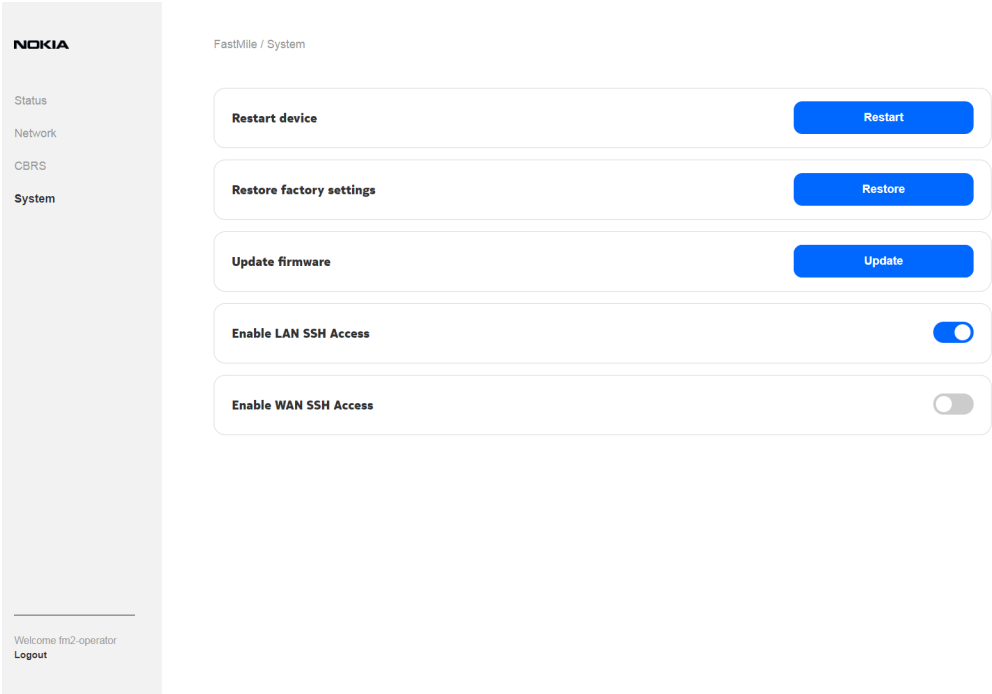


Figure 88 shows an example of the Restart Device confirmation window.

Figure 88 **Example of the Restart Device confirmation window**

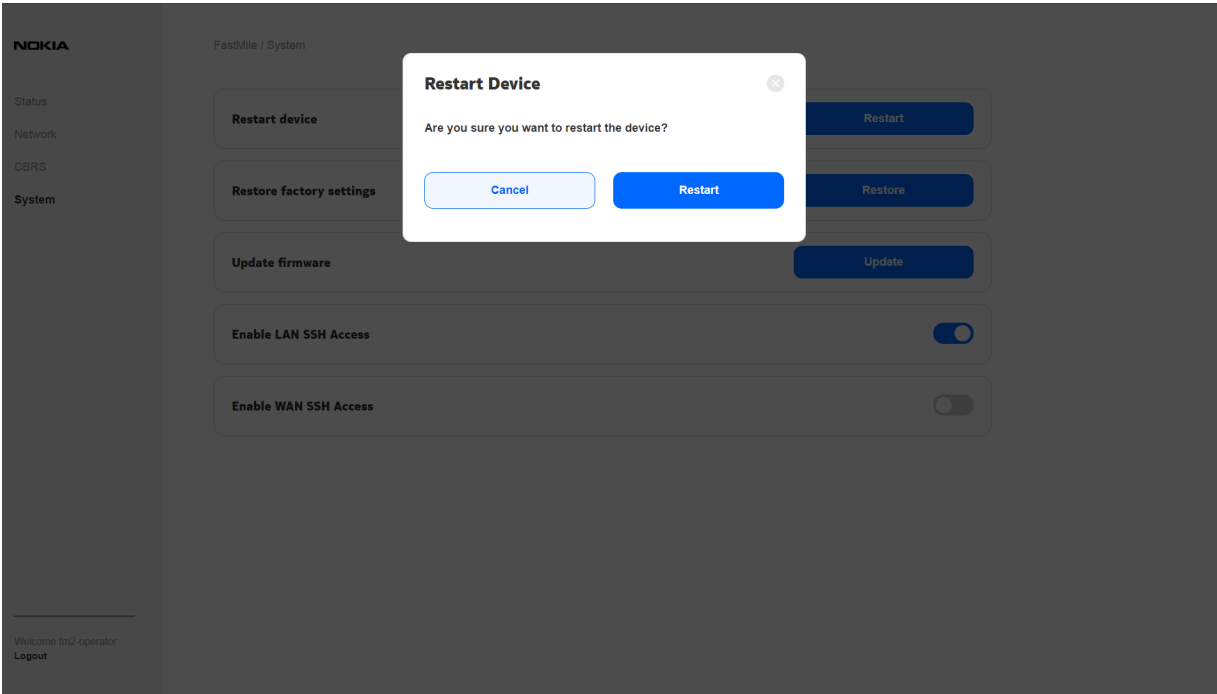


Figure 89 shows an example of the Restore Device confirmation window used to restore the device to factory settings.

Figure 89 **Example of the Restore Device confirmation window**

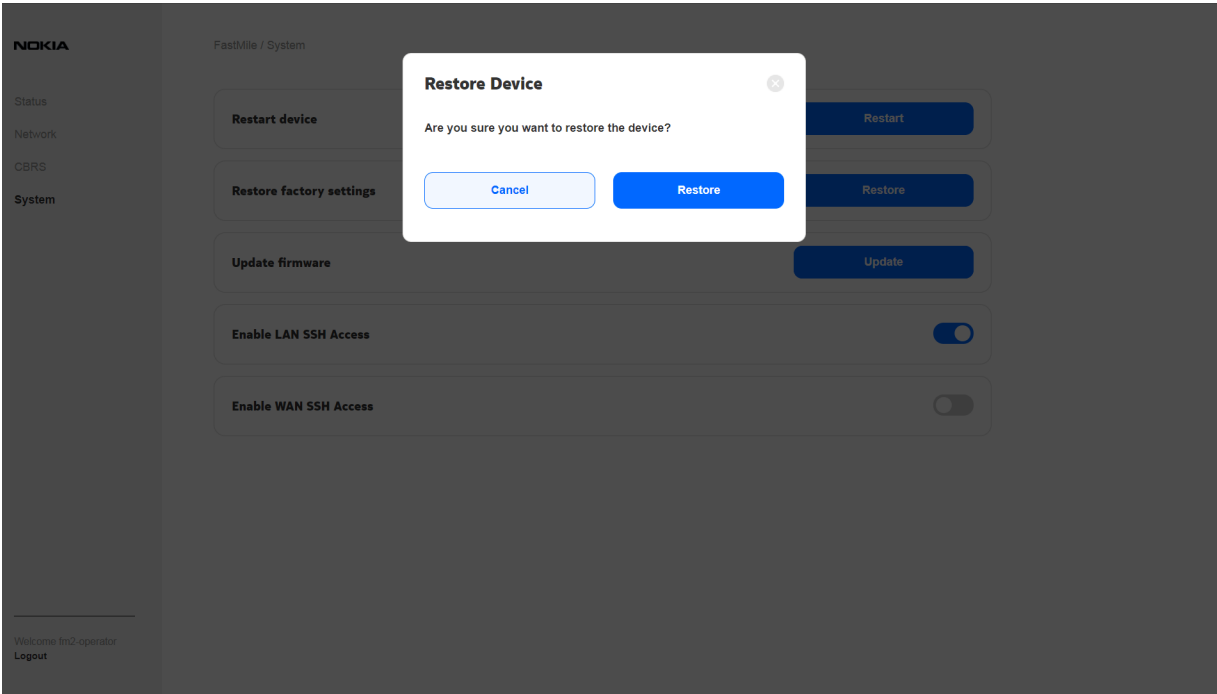


Figure 90 shows an example of the screen that displays while firmware is being uploaded.

Figure 90 Example of the screen that displays while firmware is being uploaded

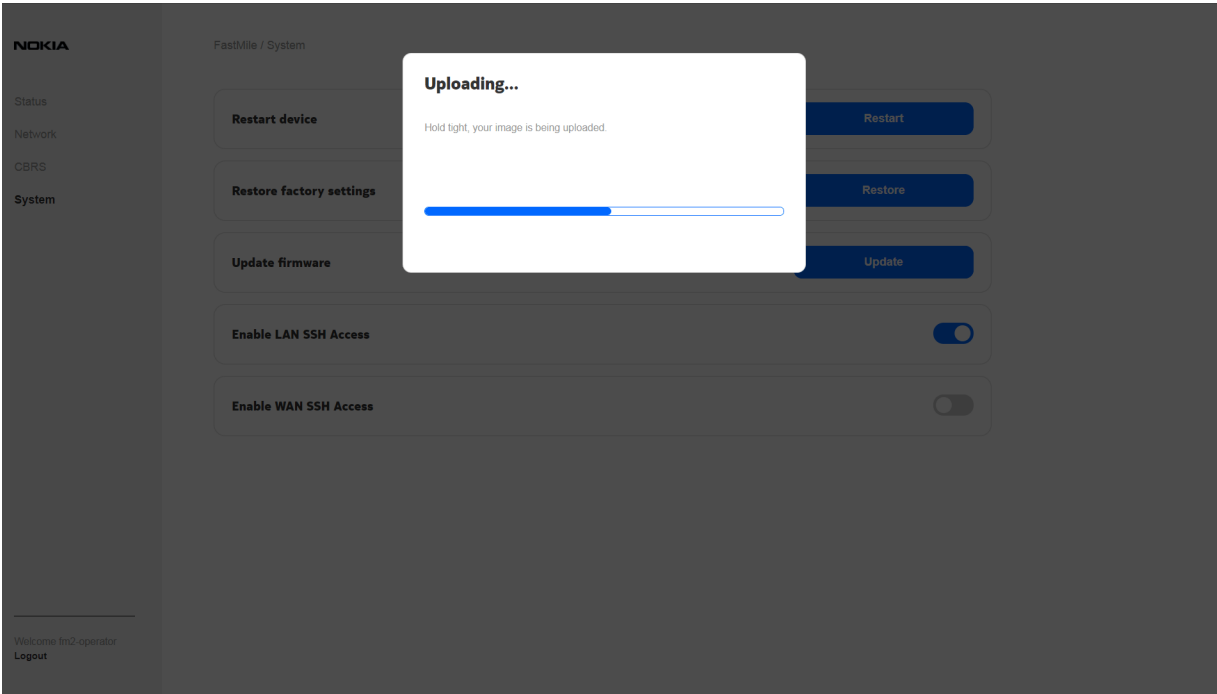


Figure 91 shows an example of the screen that displays while firmware is being upgraded.

Figure 91 Example of the screen that displays while firmware is being upgraded

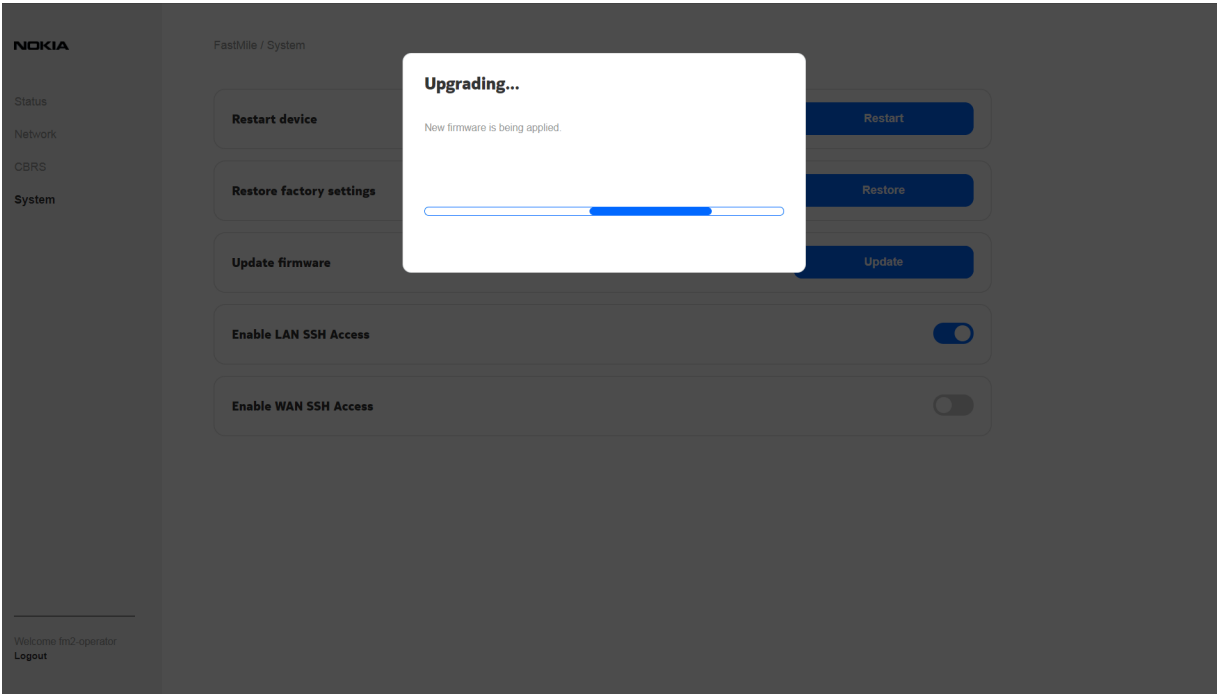
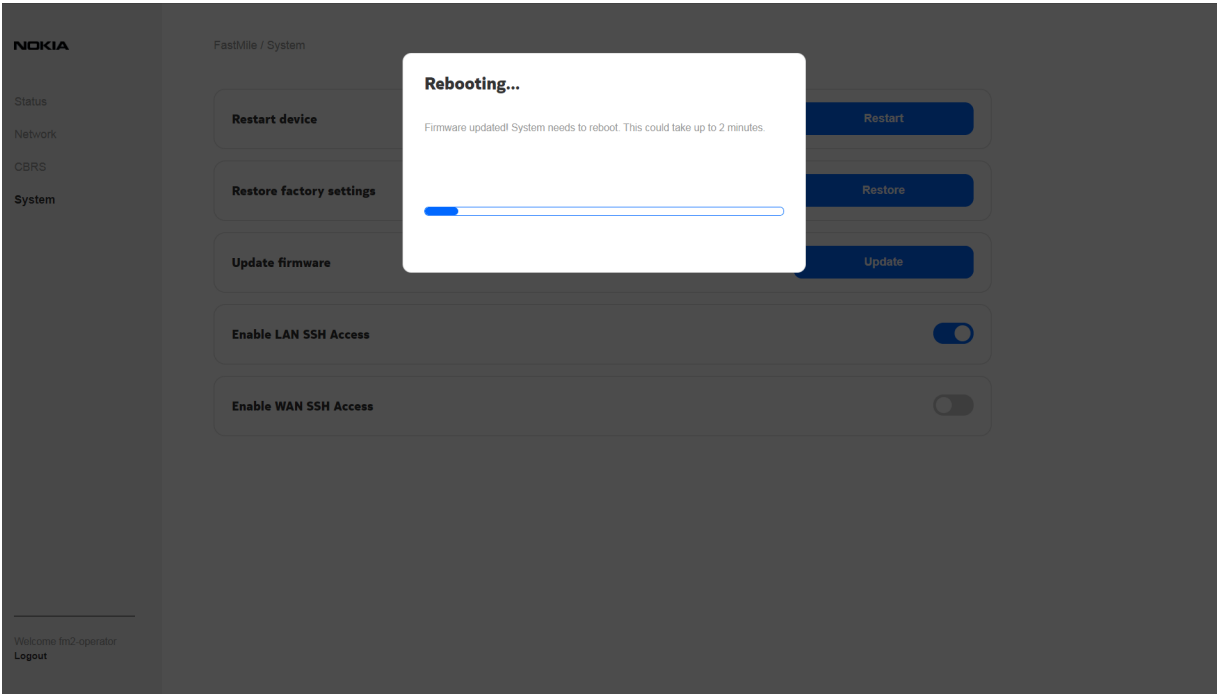


Figure 92 shows an example of the screen that displays while the system is being rebooted.

Figure 92 Example of the screen that displays while the system is being rebooted



15 Standards certification

15.1 Standards certification for the Nokia FastMile 4G Receiver

15.1 Standards certification for the Nokia FastMile 4G Receiver

Table 27 provides standards certification information for all models of the Nokia FastMile 4G Receiver.

Table 27 Standards certifications for the Nokia FastMile 4G Receiver

Category	Standard	Certifications
FCC	FCC Part 47	4G01-A with B48 and Bluetooth 3.0 4G01-C with B48 and Bluetooth 4.2 4G03-A with B7\B41 and Bluetooth 3.0 4G05-A with B41 and Bluetooth 3.0 4G06-A with B2\B25\B4\B66\B7\B48 and Bluetooth 3.0
ISED	RSS series	4G01-B with B48 and Bluetooth 3.0
ETL	UL/CSA 62368-1 UL 50E CSA C22.2 NO.94 UL/CSA 60950-22	4G01-A\4G01-B\4G01-C\4G03-A\4G05-A\4G06-A
CE	Directive 2014/53/EU as following standards: ETSI EN 301 489-1\17\52 EN 301908-1\13 ETSI EN 300 328	4G01-A with B42\B43 and Bluetooth 3.0 4G02-A with B3 and Bluetooth 3.0 4G03-A with B7\B38\B40 and Bluetooth 3.0 4G04-A with B3\B7\B20\B32 and Bluetooth 3.0 4G05-A with B1\B3\B7\B20\B28\B38\B40 and Bluetooth 3.0 4G05-B with B1\B3\B7\B20\B28\B38\B40 and Bluetooth 3.0 4G06-A with B7\B28\B42\B43 and Bluetooth 3.0 4G17-A with B1\B3\B7\B20\B32 and Bluetooth 3.0
CB	Directive 2014/35/EU as following standards: EN/IEC 62368-1 EN/IEC 60950-22	4G01-A\4G02-A\4G03-A\4G04-A\4G05-A\4G05-B\4G06-A\4G17-A
RoHS	Directive 2011/65/EU and as amended	All models and types

See chapter 18 for FCC statements and label instructions.

16 Appendix A: Specifications

16.1 Specifications

16.1 Specifications

Table 28 provides some specifications for the Nokia FastMile 4G Receiver.

Table 28 Specifications for the Nokia FastMile 4G Receiver

Item	Description
Dimensions	Compact multi-band models: 22.7 cm by 22.7 cm by 6.4 cm (8.94 in by 8.94 in by 2.52 in) Compact mono-band models: 23.5 cm by 23.5 cm by 5.2 cm (9.3 in by 9.3 in by 2 in) ABA models: 31.8 cm by 31.8 cm by 5.6 cm (12.5 in by 12.5 in by 2.2 in) High gain CBRS model: 31.8 cm by 31.8 cm by 7.0 cm (12.5 in by 12.5 in by 2.8 in)
Weight	Compact multi-band models: 0.88 kg (1.9 lb) Compact mono-band models: 1.3 kg (2.9 lb) ABA models: 2 kg (4.4 lb) High gain CBRS model: less than 1.5 kg (3.3 lb)
Power consumption	Maximum: 10 W Idle: 1.6 W
Operating altitude	Maximum operating altitude is 3048 m (10 000 ft) above mean sea level
Non-operating altitude	Maximum non-operating altitude is 12 192 m (40 000 ft) above mean sea level
Operating temperature	Compact mono-band and ABA models: <ul style="list-style-type: none"> –30°C to 65°C (–22°F to 149°F) Compact multi-band models and High gain CBRS model: <ul style="list-style-type: none"> Model 4G05-B: –40°C to 55°C (–40°F to 131°F) High gain CBRS model and compact multi-band models other than Model 4G05-B: –30°C to 55°C (–22°F to 131°F)
Storage temperature	–40°C to 85°C (–85°F to 185°F)
Humidity	5% to 95% non condensing
IP rating	IP66 TYPE3

17 Appendix B: RF exposure

17.1 RF exposure

17.1 RF exposure

The international standards used for the assessment of this device provide simple conformity assessment methods for low power electronic and electrical equipment to an exposure limit relevant to electromagnetic fields (EMF).

Table 29 indicates RF exposure distances for each model for:

- CE based on the compliance criteria for maximum permissible exposure as in CE Council Recommendation Directive 2014/53/EU
- FCC based on the compliance criteria for maximum permissible exposure as in FCC 47

Table 29 RF exposure distances

Model	RF exposure distance	
	CE	FCC
4G01-A	50 cm (19.69 in)	20 cm (7.87 in)
4G01-B	50 cm (19.69 in)	50 cm (19.69 in)
4G01-C	N/A	50 cm (19.69 in)
4G02-A	50 cm (19.69 in)	N/A
4G03-A	50 cm (19.69 in)	50 cm (19.69 in)
4G04-A	20 cm (7.87 in)	20 cm (7.87 in)
4G05-A	20 cm (7.87 in)	N/A
4G05-B	20 cm (7.87 in)	N/A
4G06-A	20 cm (7.87 in)	23 cm (9.06 in)
4G17-A	20 cm (7.87 in)	N/A

18 Appendix C: FCC statements and label instructions

18.1 FCC compliance statement

18.2 FCC radiation exposure statement

18.3 FCC label instructions

18.1 FCC compliance statement

Table 30 provides the FCC ID for applicable models of the Nokia FastMile 4G Receiver.

Table 30 FCC ID for applicable models of the Nokia FastMile 4G Receiver

Model	FCC ID
4G01-A	2ADZR34003800FM20
4G01-B	2ADZR34003800FM201
4G01-C	2ADZR4G01C
4G03-A	2ADZR23002690FM20
4G05-A	2ADZR4G05A
4G06-A	2ADZR4G06A

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

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

18.2 FCC radiation exposure statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distances indicated in chapter 17 between the radiator and your body.

18.3 FCC label instructions

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as: "Contains Transmitter Module FCC ID: 2ADZR4G04A and 2ADZR4G05A". Any similar wording that expresses the same meaning may be used.

19 Glossary

This glossary provides the expansions and optional descriptions of most acronyms and initialisms that appear in this document.

3GPP	3rd Generation Partnership Project
ABA	Automated Beam Alignment
ACS	Auto Configuration Server
ANSI	American National Standards Institute
AP	Access Point
APN	Access Point Name
CA	Certificate Authority or Carrier Aggregation
CBRS	Citizens Band Radio Service
CRoHS	China Restriction of Hazardous Substances
DL	Downlink
DSCP	Differentiated Services Code Point
DUID	Device Unique Identifier
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
ECI	External Call Interface
EPC	Evolved Packet Core
E-UTRA	Evolved Universal Terrestrial Radio Access
EIP	Electronic Information Products
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EPC	Evolved Packet Core
ESD	Electrostatic Discharge
ETL	Electrotechnical Laboratory
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
FDD	Frequency Division Duplex

FM	FastMile
HSS	Home Subscriber Server
IEEE	Institute of Electrical and Electronics Engineers
IP	International Protection or Internet Protocol
IPTV	Internet Protocol over Television
LAN	Local Area Network
LED	Light Emitting Diode
LTE	Long-Term Evolution
MAC	Media Access Control
MCV	Maximum Concentration Value or Minimum Concentration Value
MIMO	Multiple-Input Multiple-Output
MME	Mobility Management Entity
NAC	Network Access Control
NEC	National Electrical Code
OAM	Operations and Maintenance
PCI	Physical Cell Identifier
PCRF	Policy and Charging Rules Function
PDF	Portable Document Format
PIN	Personal Identification Number
PoE	Power over Ethernet
QCI	QoS Class Identifier
QoS	Quality of Service
QR	Quick Response
RF	Radio Frequency
RoHS	Restriction of Hazardous Substances
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
RSSI	Received Signal Strength Indicator

SIM	Subscriber Identify Module
SINR	Signal-to-Interference-plus-Noise Ratio
TCP	Transmission Control Protocol
TDD	Time Division Duplex
UDP	User Datagram Protocol
UL	Underwriters' Laboratories or Uplink
URL	Uniform Resource Locator
VDC	Volts Direct Current
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
WiFi	Wireless Fidelity

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