

5G NR Small Cell NR xCell 46116A User Guide

PDF

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Security Information

For the safety of installation engineers and to protect the equipment from damage, please read all safety warnings carefully. If you have any questions about these warnings, please contact the Askey support team before installing or powering up the base station.

Declaration of Conformity

Hereby, Askey declares that the radio equipment type NR xCell 46116A is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: https://askeycloud.askey.com/owncloud/index.php/s/ZA8LBnW6WvQenPo



Federal Communication Commission Interference Statement

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FOR MOBILE DEVICE USAGE (>20cm/low power)

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 distance 20cm between the radiator & your body.



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Chapter 1 Introduction

1.1 Brief Introduction

This user Guide introduces the Askey 5G NR indoor small cell NR xCell 46116A for Enterprise, which supports N48 (3.55~3.7GHz)/N77 (3.7~4.0GHz) band. Meeting the demand for indoor connectivity, it is an ideal and powerful solution to deliver a superior network access experience. This super and compact small cell has integrated baseband and radio into a single product, which can support external antenna and help break installation barriers. The NR xCell 46116A Small Cell is part of the carrier-grade, end-to-end Askey Small Cells solution that is definitely suitable for various scenarios, such as smart buildings, factories, hospitals, shopping malls, elevators, underground parking etc.

Figure 1. Askey 5G NR Indoor Small Cell NR xCell 46116A



1.2 Specification

Table 1. NR xCell 46116A General Specification

Item	Description
	N48(3.55~3.7GHz)
Band	N77(3.7~4.0GHz)
Bandwidth	N48 : 10/20/30/40 MHz
	N77 : 40/50/60/70/80/90/100MHz
Max. TX Power	N48: EIRP < 30dBm
	N77: 24dBm
Antenna	Internal/External 2x2 MIMO
LED	1 LED
Backhaul	10G SFP+/2.5G WAN



Power Supply	DC 12V/POE++
Power Consumption	40W
Active Users	16~32
Data Rates	700Mbps/100 Mbps
Installation	Wall /Ceiling/Pole mount
IP Grade	IP50
Dimensions	W250 x H250 x D65mm
Weight	<2.5kG
Operating Temperature	-5°C – 50°C
Operating Humidity	90% maximum, non-condensing

1.3 What's in The Box

The Askey NR xCell 46116A box contains:

- NR xCell 46116A
- Power Adapter
- GPS antenna

The following optional items are available:

- Ethernet cable (Optional)
- Mounting Accessories (Optional)
- SFP+ module(Optional)

Table 2. List of Items in The Box

Items	Qty	Description	Picture
1. Askey Small Cell NR xCell 46116A	1	The Askey 5G NR indoor small cell NR xCell 46116A. Please check the label to make sure you have received the correct base station	-
2. Power Adapter	1	Length: 2.6m	Se la
3. GPS antenna	1	Length: 7m	
4. Ethernet cable (Optional)	1		Q
5. Mounting Accessories (Optional)	1	Optional, 3 types for wall mount, ceiling mount, and pole mount, please refer to 2.4 for more details	



6. SFP+ module (Optional)	1	10G SFP+, please note that the highest operating temperature specification of 10G SFP+ module must be workable at minimum 75°C.	
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1.4 IO Interfaces

This section will guide you through the interfaces and functions of NR xCell 46116A. About the RF Antenna, there are two different scenarios,

- Internal antenna. Using the embedded antennas in the housing (Default mode).
- External antenna. If you would like to use the external antennas, you need to connect the external
 antennas into the ANT1 & ANT2 port, which are SMA connector. There is the description about the
 operation function of antenna switching in Section 3.5.3 RF Antenna. Users can directly operate in
 the web UI to switch to the external antenna they want to use.

About Synchronization, there are two different scenarios,

- With GPS. The GPS antenna is required for the automated setup process and search for the GPS signal for synchronization.
- Without GPS. In this scenario, you must have the grand master and BC Switch for synchronization rather than GPS, so in this scenario the GPS is not necessary.

NR xCell 46116A has a single multicolored LED used to indicate the device connectivity status. Please review Section 2.3 LED status for the LED guide when attempting to troubleshoot the solution.



Table 3. NR xCell 46116A IO Interface

Item	Description	
SFP+	The SFP+ port allows you to connect a fiber to establish communication	
	between NR xCell 46116A and switch/router.	
RESET	The Reset allows you to reset the device to factory defaults.	
GPS	The GPS antenna port provides access to a SMA Female interface for	
	the external GPS antenna cable. When GM/BC switch is used, no GPS is	



	needed to connect.	
1PPS	Output the PPS synchronization signal.	
DBG	The DBG port is used for debug.	
WAN	The WAN port allows you to connect an Ethernet cable to establish	
	communication between NR xCell 46116A and switch/router.	
DC IN	The 12V DC Power port is used to power NR xCell 46116A when	
	connected to the AC power adaptor. Use only the provided power	
	adapter, as using any other power adapter may damage NR xCell	
	46116A	
ANT1	ANT1 for External 3.3-5GHz 5G antenna connection	
ANT2	ANT2 for External 3.3-5GHz 5G antenna connection	

The equipment is to be connected only to PoE networks without routing to the outside plant The equipment with a GPS function has not been evaluated for "life-safety" and "non-lifesafety" applications.

External antenna ports ANT1/ANT2 are disabled via software for this model and is not modifiable by any third-party / end-user





Chapter 2 Setup

2.1 Setup Procedure

This part outlines the procedures needed to set up NR xCell 46116A.



2.2 Cable Connection

Connect the Ethernet cable, power cable and GPS antenna correctly.

Indoor GPS antenna

- 1. Turn off NR xCell 46116A.
- 2. Connect the provided Indoor GPS antenna cable to GPS port on the NR xCell 46116A.
- 3. Place the antenna near a window where the GPS signal is stronger.
- 4. Turn on the NR xCell 46116A to allow the detection of an available GPS signal.

Noted:

- If using PTP sync solution. there is no need to connect the GPS antenna to the NR xCell 46116A.
- If using fiber transmission. 10G SFP+ module and fiber are needed. Please note that the highest operating temperature specification of 10G SFP+ module must be workable at minimum 75°C., otherwise the device will be down.





2.3 LED Status

After all the connections are connected and the NR xCell 46116A is powered on, please check the status of LED on the device. The LED will flash according to the LED description provided in Table 4. If the NR xCell 46116A is operating as expected, continue to Section 2.4. If the NR xCell 46116A is not functioning properly and you have to carefully check all steps.



Table 4. LED Status Overview

Item	Description	LED	User instruction
1	Power On	Solid Red	
2	Network is initializing	Blue Blink (Light on for 3 seconds, light off for 3 seconds)	 The small cell is acquiring IP address, please wait. If the LED stays at this stage for more than 5 mins, please check the Ethernet cable is firmly connected at both ends, and the switch, router, or internet gateway is turned on.
3	GPS Sync Progressing	Green Blink (Light on for 1 seconds, light off for 3 seconds)	 The small cell is syncing and acquiring GPS signal, please wait. If the LED stays at this stage for more than 10 mins, the small cell has failed to acquire minimally required GPS signal, please try to move your GPS antenna closer to the window. If the issue persists, please call Customer Service. Note: First GPS sync lock may take 45 minutes
4	OAM Configuring	Blue Blink (Light on for 1 seconds, light off for 3 seconds)	 The network management server is provisioning the small cell, please wait. If the LED stays at this stage for more than 10 minutes, the small cell has not received all required or correct provisioning parameters from HeMS. Please try reboot your device again. If the issue persists, please call Customer Service.
5	5G Service is initializing	Blue Blink (Light on for 1 seconds, light off for 1 seconds)	 The small cell is syncing with 5G network, please wait. If the LED stays at this stage for more than 10 minutes, the small cell is still trying to connect to HeNB Gateway, please check the LAN/ firewall setting or contact your network administrator. If the issue persists, please call Customer Service.
6	5G Service Ready	Solid Blue	5G service is ready in the small cell.
7	5G Service In Progress	Green Blink (Light on for 1 seconds, light off for 1 seconds)	UE is connecting to 5G small cell, service is in progress.



8	Overheating	Red Blink (Light on for 3 seconds, light off for 3 seconds)	The small cell is overheating, please place this device in a cool area where the temperature is between 23~122 degrees Fahrenheit.
9	Software Upgrade	Fast Blue Blink	We are upgrading the software in the small cell, please wait.
10	GPS no signal	Red Blink (Light on for 1 seconds, light off for 1 seconds)	 The small cell has tried to acquire GPS signal for 10 minutes, but failed to acquire minimally required GPS signal. Please try to move your GPS antenna closer to the window. If the issue persists, please call Customer Service.

2.4 Installation

There are mainly 3 ways for NR xCell 46116A installation - wall mount, ceiling mount and pole mount. This section will guide you through all the installation ways for NR xCell 46116A.

2.4.1 Preparation: Fix the mount base to NR xCell 46116A

No matter which mount installation method you choose, the first step is to fix the mount base to NR xCell 46116A with M4 screw*4, as shown in the figure 5.





Figure 5. Fix the Mount Base to NR xCell 46116A

2.4.2 Wall Mount

Table 5. List of Items for Wall Mount

Items	Qty	Description	Picture
1. Mount base	1	Fix the mount base to NR xCell 46116A with M4 screw*4	
2. Mount bracket	1	Fixed to the wall, used with the mount base to fix the NR xCell 46116A	
3. Screw anchor	2	To fix the screws (STP3.5-20)	-jiam
4. M4 Screw(M4*0.7*11L)	4	To fix the mount base to NR xCell 46116A	9-
5. Screw(STP3.5-20)	2	To fix the mount bracket to the wall	Contract.

Installation steps,

- 1. Place the mount bracket on the wall. Mark and drill 2 screw holes on the wall.
- 2. Use a tool to insert 2 screw anchors into the drilled holes on the wall.
- 3. Align the inserted screw anchors and the screw holes of the bracket. Fix the bracket to the wall by fastening 2 screws(STP3.5-20).

4. End.



Figure 6. Wall Mount Overview



2.4.3 Ceiling Mount

Only 3 widths of T bar are supported, 15mm, 24mm & 38mm.



Table 6 List of Items for Ceiling Mount

Items	Qty	Description	Picture
1. Mount base	1	Fix the mount base to NR xCell 46116A with M4 screw*4	
2. Mount bracket	1	Fixed to the T bar, used with the mount base to fix the NR xCell 46116A	
3. Ceiling bracket	2	To fix T bar & mount bracket	110
4. M3 Screw	6	To fix the ceiling bracket	
5. M4 Screw	4	To fix the mount base to NR xCell 46116A	



Installation steps,

- 1. Adjust the Ceiling Bracket*2 to fit the width of the T Bar.
- 2. Fastening M3 screws*2 to fix the Ceiling Bracket on the T Bar.
- 3. Fastening M3 screws*4 to fix the Ceiling Bracket to the Mount Bracket.
- 4. End.



2.4.4 Pole Mount

Table 7. List of Items for Pole Mount

Items	Qty	Description	Picture
1. Mount base	1	Fix the mount base to NR xCell 46116A with M4 screw*4	
2. Mount bracket	1	Used with the mount base to fix the NR xCell 46116A	
3. Ceiling bracket	2	To fix mount bracket & lashing ring	1995 A
4. lashing ring	2	Wrapped to a pole	10
5. M3 Screw	4	To fix the ceiling bracket to the mount bracket	
6. M4 Screw	4	To fix the mount base to NR xCell 46116A	3

Installation steps,

1. Fastening M3 screws*4 to fix the Ceiling Bracket on the Mount Bracket.

2. Pass the lashing ring *2 through the Ceiling Bracket.

- 3. The lashing ring wraps around the pole and please lock the lashing ring.
- 4. End.





2.4.5 Align the mount base and the mount bracket

- 1. Align the mount base with the 3 holes on the mount bracket and then turn clockwise to fix it in place.
- 2. Please note to fasten the screw to prevent NR xCell 46116A from falling.

Figure 10. Align the Mount Base and the Mount Bracket

1. Align the mount base with the 3 holes on the mount bracket and then turn clockwise to fix it in place



2.5 Route the Cables

After finishing the installation, please connect various cables to the NR xCell 46116A according to Section 2.2, and route the cables in a standard way to keep them looking good. Power on the NR xCell 46116A again, and check the NR xCell 46116A work properly by the status of LED.



Chapter 3 The Askey 5G NR Small Cell Admin Website

This section contains detailed information regarding the Askey 5G NR Small Cell Admin Website, where you can see the device status and make changes in the configurations.

To access the Askey 5G NR Small Cell Admin Website by following these steps:

- 1. Use a PC/NB connected to the same network as the Askey 5G NR Small Cell
- 2. Open a browser and enter the IPv4 address of the Askey 5G NR Small Cell as the following URL:

http://<ip address>, or https://<ip address>

The two primary network ports, WAN and SFP+ in the following Figure, are used to connect the Small Cell backhaul. All the default IP addressing modes are DHCP, and you can change to the Static IP mode on the **Settings: Network** page.



The DBG port is a debug or rescue interface with the default Static IP **192.168.8.100**. You can connect directly to a PC/NB and surf the Admin Web by the URL **http://192.168.8.100** on PC/NB. The network setting of the DBG port could be modified if surfing the Admin Web by the method. But it only supports the Static IP mode starting with **192.168.8.** and doesn't support the gateway and name server.

The IP address of the DBG port will be reset to **192.168.8.100** if performing the factory reset on the Admin Web or holding the RESET button for more than 15 seconds.

The browser might display a warning message for the HTTPS access as the following illustration because the HTTPS server uses a self-signed certificate not signed by the Certificate Chain of Trust. Please click the "Advanced" button and continue surfing the website.

Figure 12. Access the Askey 5G NR Small Cell Admin Website via HTTPS







3.1 Admin Website Overview

3.1.1 Sign In

The homepage of the Admin Website will just be a login form. Please input the default administrator password.

The default password is "AskNodeB" + last 4 digits of the MAC (WAN) (e.g., AskNodeB F504).



The password is case-sensitive. Letters in the last four digits of the MAC ID should be **UPPER** case.





After the successful login, the Admin Website gives you the device information of the Askey 5G NR Small Cell.

lome	5G NR Sm	all Cell	
onnected Devices	System Informatio	'n	ii ii
iettings	~ Operational Status	In Service	
Configuration	- IP Address	fm1-mac9 : 10.1.108.156, 10.1.108.157 (WAN fm1-mac10 : 0.0.0.0 (SFP+) fm1-mac3 : 192.168.8.100 (DBG)	0
bout	MAC Address	fm1-mac9 : 4CA8F8DA50A2 fm1-mac10 : 4CA8F8DA50A3 fm1-mac3 : 4CA8F8DA50A4	
	Software Version	SCE2120 (NSC-Dust-Sub6-GA-REG3) v2.2.009.1535	
	Location	(Source: GPS) O Mep Latitude: 24.999598	GPS Details

The page shows basic device information such as the Operational Status, IP Address, MAC address, the software version, the GPS fixed location, and the Map illustration.

The quick reference icons on the upper right of the Welcome page indicate service status, GPS status, number of connected devices, and sign-in status as the following illustrators.







Figure 17. The Askey 5G NR Small Cell GPS Status





💫 : GPS Un-Lock Status



The GPS coordinates will be displayed at the bottom of the page if the GPS location is acquired. You can click the "**GPS Detail**" link to surf the GPS information page or click the "**Map**" to open the map illustration generated by **©OpenStreetMap** as the following:



Figure 18. Map Illustration



3.2 Home

The Homepage provides all the Askey 5G NR Small Cell information.

Figure 19. The Askey 5G NR Small Cell Home Page

	5G NR Sm	all Cell	
Connected Devices	System Informatio	n	12
Settings			
	Operational Status	In Service	
Configuration	ID Address	fm1-mac9 : 10.1.108.156, 10.1.108.157 (WAN)	
About	IF PERCESS	fm1-mac3 : 192.168.8.100 (DBG)	
		fm1-mac9 : 4CABF8DA50A2	
	MAC Address	fm1-mac3: 4CA8F8DA50A3 fm1-mac3: 4CA8F8DA50A4	
	Software Version	SCE2120 (NSC-Dual-Sub6-GA-REG3) v2.2.009.1535	
		(Source: GPS) O Map	
	Location	Latitude: 24.999598 Longitude: 121.482705	GPS Details

Table 8. The Askey 5G NR Small Cell Home Page

Items	Descriptions
Operational Status	The current operational status of the Askey 5G NR Small Cell.
IP Address	The Internet Protocol (IP) address of the Askey 5G NR Small Cell for the WAN, SFP+, and DBG ports, or Bridge interface (for NSA mode).
MAC Address	The MAC address associated with the device which can also be found on a sticker attached to the Askey 5G NR Small Cell.
Software Version	The current software version of the Askey 5G NR Small Cell includes the model name and access mode.
Location	It is the physical location of the Askey 5G NR Small Cell as reported by GPS.
Мар 🗣	Clicking this link plots the location of the Askey 5G NR Small Cell on an Open Street Map. The Open Street Map link is available only if the GPS Status is "Location Acquired".

3.3 Connected Devices

The connected devices page shows the current connected users.



5G NR

🛞 ASKEY	r	5G NR	٥	0	Sign Out
Home	Connected Devices				
Connected Devices	Last Data Befreeb. 02-22-2022-00-12-42 (UTC+0)				
Settings	This page will refresh every 15 seconds.				
Configuration	Current Connections				
About	Total connections		0		
	Emergency Calls		0		

Figure 20. The Askey 5G NR Small Cell Connected Devices Page

Table 9. The Askey 5G NR Small Cell Connected Devices

Item	Description
Last Data Refresh	The local time when this page was last refreshed.
Total Connections	The number of wireless devices (phone, tablets, or other data devices) currently connected to the Askey 5G NR Small Cell with an active call or data session.
Emergency Calls	The number of wireless devices currently connected to the Askey 5G NR Small Cell with an active call to emergency services.



3.4 Settings

3.4.1 Network

From the Askey 5G NR Small Cell Network page, you can check and modify the detailed network settings. The settings will be effective immediately without rebooting.

me	Settings:	Vetwork	
nnected Devices			
Hinns	Interface	fm1-mac9 - WAN	~
twork	IP Address	10.1.108.156	
vanced	Subnet Mask	255 255 248.0	
c Source	Default Gateway	10.1.109.1	
et	Primary DNS	10.1.240.1	
figuration	Secondary DNS	1.1.1.1	
at			_

If the device has the multiple network interfaces, you can choose the interface by clicking the select bar as the following illustration:

interface	hird-mac%-WWW	~
S DHCP	🖌 fm1-mac9 - WAN	
IP Address	fm1-mac10 - SEP+	

Figure 22. The Askey 5G NR Small Cell Network Page for the 2nd Interface



	Interface	fm1-mac10-SEP+	U I
ettings			
letwork	IP Address	0.0.0	
dvanced	Subnet Mask	0.0.0.0	
lync Source			
	Default Gateway		
leset	Primary DNS		
Configuration	Secondary DNS		
lbout ~			-

When the DHCP checkbox is disabled, you can manually set the network configurations for the specific interface. Click the IP Address or Subnet Mask item will pop up a dialog window to edit the multiple static IP addresses.

Interface	fm1-mac9 - WAN	~
DHCP	Click	/
IP Address	10.1.108.156	
Subnet Mask	255.255.248.0	
Default Gateway	10.1.106.1	





iterface	fm1-mac9 - WAN		~
DHCP	Edit IP Adress and	Subnet Mask	
Address	IP Address	Subnet Mask	Action
abret Mask	10.1.108.156	255.255.248.0	Delete
efault Gateway			Add
rimary DNS		Cano	el OK

The IP address and subnet mask value can be modified directly on the dialog window, and remove the item by clicking the Delete button. If you want to add a new item, click the Add button and edit the configuration.

Figure 24. Add a new Item in Static IP Addresses Dialog Window

Edit IP Adress and Subnet Mask

IP Address	Subnet Mask	Action
10.1,108.156	255.255.248.0	Delete
10.1.108.157	255.255.248.0	Delete
		Add

Cancel

OK



All IP addresses and Subnet Mask will display by the comma-separated format on the Admin Website. Click the Save button to activate the multiple IP addresses without rebooting.

Figure 25. The Askey 5G NR Small Cell Network Page with the multiple IP addresses

Settings: Network

Interface	fm1-mac9 - WAN 🗸
IP Address	10.1.108.156, 10.1.108.157
Subnet Mask	255.255.248.0, 255.255.248.0
Default Gateway	10.1.106.1
Primary DNS	10.1.240.1
Secondary DNS	1.1.1.1
	Cancel Save
The setting	is changed successfully.

After the setting is changed successfully, you can use the browser to access the Admin Website by the new alternate static IP address.





If you access the Admin Web by the IP address of the DBG interface displayed on the homepage, you can find the DBG item in the Interface select box as the following:

Interface	1m1-mac/9 - WAN	8
O DHCP	🛩 fmi1-mac9 - WAN	
IP Address	fm1-mac10 - SFP+	
Subnet Mask	fm1-mac3 - 080	

It means that you can click the item to modify the IP address of the DBG interface. As per the above statement, the IP address of the DBG interface only supports static IP starting with 192.168.8. and doesn't support to modify the gateway or name server. The GUI has some differences from other ports, as shown in the following illustration:



Home	Settings:	Network	
Connected Devices	Interface	fm1-mac3-DBG	v
Settings	IP Address	192.168.8.100	
Network	Subnet Mask	255 255 255 0	
Advanced		Cancel	Sime

After you modify the new IP Address of the DBG port, you need to re-access the Admin Website with the new IP address.

ASKE	»
Home	Settings: Network
Connected Devices WARNING	Anni-maici - 08G
^{ر دم} ي. Wating for Cor	mection to re-establish 258-258.255.0



192.168.8.72/ 🧿 🥏	× 🖀 🛛	G 1/2 6	è 🙎
E V			5G NR SA
5G NR Sr	nall Ce	11	
System Information	tion		
V Operational Status	In Ser	vice	
IP Address	fm1-m fm1-m	nac9 : 10.1.108.15 nac10 : 0.0.0.0 (SF	56 (WAN) "P+)
	192.168.8.72/ C C C C C C C C C C C C C C C C C C	In Service Image: status Im	Instanta Image: Second status Image: Seco

Tahle	10	The	Askev	5G	NR	Small	Cell	Network
lane	10.	me	ASKey	96	INIT	Siliali	Cell	Network

Item	Description
DHCP	This is a checkbox item. When it is checked (default), the DHCP is enabled, and the local DHCP server shall provide the IP configurations to the device. The user may uncheck this box to specify the multiple static IP configuration.
Default Gateway	If the DHCP is enabled, this field is read-only. It shows the DHCP-allocated default gateway IP address. If the DHCP is disabled, this field is read-write and indicates the user-defined Default Gateway IP address.
IP Address	If the DHCP is enabled, this field is read-only. It shows the DHCP-allocated IPv4 address. If the DHCP is disabled, this field is read-write and indicates the user-defined IPv4 address. It supports multiple combinations of the static IP address and Subnet Mask.
Subnet Mask	If the DHCP is enabled, this field is read-only. It shows the DHCP-allocated Subnet Mask. If the DHCP is disabled, this field is read-write and shows the user-defined Subnet Mask. It supports multiple combinations of the static IP address and Subnet Mask.
Primary DNS	If the DHCP is enabled, this field is read-only. It shows the DHCP allocated Primary DNS Server's IP address. If the DHCP is disabled, this field is read-write and shows the user-defined Primary DNS Server's IP address.
Secondary DNS	If the DHCP is enabled, this field is read-only. It shows the DHCP allocated Secondary DNS Server's IP address. If the DHCP is disabled, this field is read-write and indicates the user-defined Secondary DNS Server's IP address.



3.4.2 Advanced

The Askey 5G NR Small Cell Advanced page provides all cells' information and sync status.

lome	Settings: Advanced	
Connected Devices		
Settings	Last Data Refresh 02-24-2023 07:06:01 (UTC+0)	
Vetwork	5G NR Small Cell Information	
	GNB-IP	N2/N3: 10.1.108.156
dvanced	Sync Source-Status	GPS - DISP
ync Source	CELL Status	In Service
	Network ID - CELL ID	00101-1
Time Zone	Physical CELL ID (PCI)	112
	Frequency Band	77
Reset	ARFCN	649980
Configuration	Center Frequency	3749700
am4705195386A-1	Subcarrier Spacing	SORHZ
bout ~	Channel Bw	100MHZ
	Carrier Bw	273
	Timeslot Config	User Specific
	Transmit Power	21.0 d8m

. .

Table 11. The Askey 5G NR Small Cell Advanced

Item	Description
Last Data Refresh	The local time when this page was last refreshed.
5G NR Small Cell Information	This table shows the detailed information for The Askey 5G NR Small Cell. Where: •GNB-IP: The IP address of gNodeB •Sync Source-Status: The sync source and sync state
Serving Cell information	If the gNB processes are running, it will show the information of the serving cell(s). Additionally, the transmit power will show the correct value when the cell status is in-service.

3.4.3 Sync Source

The Askey 5G NR Small Cell Sync Source page provides the current sync state and the sync status for each sync source. It also allows the user to modify the sync type, priority, and detailed PTP configurations.



More

	Sync State	DISP		
ettings	Sync Type	Auto		~
etwork	Source	-	GPS	
dvanced	Priority		255	
	Status		Active	
ync Source	Source		РТР	
Time Zone Priority			100	
wet.	Status		Standby	
	PTP Interface		fm1-mac9 - WAN	v
onfiguration	Domain Numb	ber	44	
	PTP Mode		6,8275.2	
out	PTP UDP IP		10.1.106.22	

Figure 28. The Askey 5G NR Small Cell Sync Source Page

The sync type can be Auto or Manual. If the type is Manual, you should specify GPS or PTP as the sync source.

Sync Type	Manual	~
Sync Source	QPS	•
Source	🖌 GPS	
Priority	PTP	

The PTP Mode will be G.8275.1 or G.8275.2. If the mode is G.8275.2, it should also specify the PTP UDP IP.




Cancel

Save

Description Item Sync State It indicates the current sync state. It should be INIT, HARD_SYNC, DISP, RESYNC, or HOLDOVER. The cell processes will start until the sync state is DISP Sync Type / Sync Source It indicates the sync source choice mechanism. The Auto type will try the multiple sync sources based on the priority value. For the Manual type, it should specific the sync source be GPS or PTP. (For the small cell with network bridge mode, the sync source is only GPS) Priority If the sync type is Auto, the higher priority value will be tested earlier. The priority value should be the integer from 1 to 255. It indicates the sync status for source GPS or PTP. The status will be Standby or Active. Status **PTP** Interface It indicates which network interface the gNB connects to the PTP server. **Domain Number** Specific the PTP clock domain by an integer in the range of 0 to 127. PTP Mode / PTP UDP IP It indicates the current PTP mode, which supports G.8275.1 and G.8275.2. If the mode is G.8275.2, it should also specify the PTP UDP IP.

Table 12. The Askey 5G NR Small Cell Sync Source

3.4.4 Time Zone

The Askey 5G NR Small Cell Time Zone page allows the user to adjust the Time Zone Offset for the data refresh time on the Admin Website

Figure 29. The Askey 5G NR Small Cell Time Zone Page



Home	Settings:	Time Zone	61
Connected Devices	Admin Web		ă.
Settings		24	
Network	Time Zone Offset	+0	Cancel Shine
Advanced			
Sync Source			
Time Zone			

The default time zone offset is +0 (UTC). If the page will refresh automatically, the last data refresh will be displayed on the page as the following illustration:

Connected Devices

Last Data Refresh 02-24-2023 07:31:01 (UTC+0) This page will refresh every 15 seconds.

The Time Zone Offset can adjust as an integer number that ranges from -12 to 14 and activates without rebooting.

Connected Devices

Last Data Refresh 02-24-2023 15:36:21 (UTC+8) This page will refresh every 15 seconds.



3.4.5 Reset

The Askey 5G NR Small Cell Reset page allows users to remotely restart or factory reset the 5G NR Small Cell.

	Settings: Reset
Connected Devices	Complete Restart
Setting	Use this button to remotely perform a complete restart of the SG NR Small Cell when it is not
Network	Complete Restart
Advanced	Factory Reset
Sync Source	Use this button to remotely factory reset the 5G NR when it is not physically reachable. NOTE: Factory reset will revert all custom settings to factory defaults.
Reset	Factory Roset
Configuration	
About	

Factory reset will revert the custom settings to factory default settings. The admin website will pop up the following prompt message when clicking the Factory Reset button:

WARNING	×
Factory reset will revert the following custom settings to factory default settings. Do you wish to continue with factory reset? Static IP configuration Sync Source gNB configuration RF Antenna VLAN Static Routing	
Cancel OK	

If the network setting of the Askey 5G NR Small Cell is wrong or you cannot get the current IPv4 address, such that you cannot access the Admin Website by IPv4. You can use the MAC to IPv6 link-local address to



access the Admin Website by the URL http://[IPv6 Link-Local Address]/ in the same LAN. Please check the topic "Access the Admin Website by IPv6 Link-Local Address" in chapter 4. Or, if the Askey 5G NR Small Cell is near you, you can hold the reset button for more than 15 seconds and release, it will trigger the device to perform the factory reset. The following illustration is the reset button location of the device. After performing the factory reset, the Askey 5G NR Small Cell will get the IPv4 address from the DHCP server.



3.5 Configuration

3.5.1 Dashboard

This Askey 5G NR Small Cell Dashboard page shows the integrated small cell information, including the service and location data.

Figure 31. The Askey 5G NR Small Cell Dashboard Page



A Desidence

Home

Configuration: Dashboard

Connected Devices	abilit ID Address	573415-1011001Ez
Settings	gno e Address	- M4/M3- 10.1,106,130
	Cell State	In Service
Configuration	Active UEs	0
Dashboard	GNSS Fixed Status	Location Acquired
gNB	Sync Capability	GPS
Neighbor Cell	Sync State	DISP
RF Antenna	Ping Status	AMF (10.1.106.51)
VLAN		

Table 13. The Askey 5G NR Small Cell Dashboard				
Items	Descriptions			
gNB IP Address	The IP address of gNodeB. Support separately specifying the gNB local interface with AMF (N2 interface) and the UPF (N3 interface) on the gNB configuration page. The IP address is the same value for the N2 and N3 interfaces by default.			
Cell State	The current state of the small cell. It will be Not In-Service or In-Service			
Active UEs	The number of wireless devices (phone, tablets, or other data devices) currently connected to the Askey 5G NR Small Cell			
GNSS Fixed Status	The fixed status of GNSS. It will be Searching signal or Location Acquired			
Sync Capability	The sync capability of the device			
Sync State	It indicates the current sync state. It should be INIT, HARD_SYNC, DISP, RESYNC, or HOLDOVER. The cell processes will start until the sync state is DISP			
Ping Status	Check whether the network connection status of the following server by ping command (ICMP): AMF , EMS , KPI , and SAS			



Home

3.5.2 gNB

This Askey 5G NR Small Cell gNB page shows the principal configurations of CU and DU. There are some items different between SA and NSA mode. These items on Web GUI will be read-only in the remote provision method except for gNB IP because the value of gNB IP address may be one of the physical network interfaces or VLAN interfaces.

Figure 32. The Askey 5G NR Small Cell gNB Page

Configuration: gNB CU

attings		gind do		
	Provision Method	Remote Local		
onfiguration ^	gNB N2 IP	10.1.108.156		
ashboard	🗇 gNB N3 IP	10.1.108.156		
NB	Management Server	This roles is equid to phil ND IF http://wcs6.askey.ga.6583/acs/NoAuthACSServer	1.	
eighbor Cell	KPI Server	0mpi0/0.0.0.0		
F Antenna	KP1 Upload Interval	60	(mina)	
LAN	Site(gNB) ID	8109		
atic Routing	gNB ID Length	22		
ersion	Cell ID	1		
bout -	TAC	8108		
	MCC	001		
	MNC	01		
	AMFIP	10.1.306.31		
	UE inact Timer	megiliti	~	
	Encrypt Algo	HEAT	٠	
	Integrity Algo	baa t		



You can change the local provision method by clicking the option **Local** in the Provision Method. After modifying the configurations, you can save these configurations by clicking the **Save** button. If there are some wrong settings, such that the cell cannot provide the 5G NR service, you can click the Default button to restore the **default** setting.

Figure 33. The Local Provision Method in gNB Configuration

Configurat	Configuration: gNB CU			
2	GNB CO			
Provision Method	() Remote () Local			
gNB N2 IP	10.1.108.156			
🔲 gNB N3 IP	10.1.108.156			
	This value is equal to gHE N2 IF			
Site(gNB) ID	8105			
gNB ID Length	22			
Cell ID				
TAC	8108			
MCC	001			
MNC	01			
AMFIP	10.1.106.51			
Integrity Aligo	NIAT			
	Configurat			

After saving these configurations, the Admin Web will trigger to restart the device such that these configurations are effective. The gNB IP address is the same value for the N2 and N3 interfaces by default. You can click the check box to specify the gNB IP for N3 interface.



gNB N2 IP	10.1.108.156
gNB N3 IP	10.1.108.157

According the following figure, you should check whether the gNB IP is correct based on the network setting and whether the cable connects to the WAN port, SFP+ port, or one of the VLAN IP addresses.



Figure 35. VLAN IP Adress



Configuration: VLAN

Interface		fm1-mac9 - WAN			
VLAN Interface	Tag ID	DHCP	IP Address	Action	
fm1-mac9-vlan5	5	NO	192.148.2.12	Delete	
fm1-mac9-vlan22	22	YES	0.0.0.0	Delete	
fm1-mac9-vlan23	23	NO	192.158.1.22	Delete	

Table 14. The Askey 5G NR Small Cell CU Configuration

Items	Descriptions			
Provision Method	The Provision Method should be Remote or Local.			
	 The Remote provision method means that the remote server, e.g., ACS, will provision the primary gNB configurations to the 5G NR Small Cell. 			
	 The Local provision method means that the 5G NR Small Cell will apply all the configurations in the local files. Users can modify the primary gNB configurations on the Admin Web GUI. 			
gNB N2 IP/gNB N3 IP	The IP address of gNodeB. It should be the IP address of WAN port, SFP+ port, or one of the VLAN interfaces. Support separately specifying the gNB local interface with AMF (N2 interface) and the UPF (N3 interface) on the gNB configuration page. The IP address is the same value for the N2 and N3 interfaces by default.			
Site(gNB) ID	It identifies a gNB within a PLMN.			
gNB ID Length	The number of bits for encoding the gNB ID.			
Cell ID	The physical-layer Cell ID of the signal. The number format			
TAC	Tracking Area Code, an element of the tracking area identity (TAI) that serves to uniquely identify the Tracking Area.			
MCC	Mobile Country Code			
MNC	Mobile Network Code			
AMF IP	The Access and Mobility Management Function IP address to carry the signaling traffic			
UE Inact Timer	Duration while UE has not received or transmitted any user data			
Encrypt Algo	NEA (Encryption Algorithm for 5G). It supports the NEA0, NEA1, NEA2, and NEA3			
Integrity Algo	EIA (EPS Integrity Algorithm). It supports the NIA1 , NIA2 , and NIA3			



You can click the upper button to switch the configuration from gNB CU to gNB DU, and vice versa. Figure 36. The Askey 5G NR Small Cell Switch CU or DU Configuration

Configuration: gNB CU

	gNB CU
Provision Method	Remote
gNB IP	10.1.108.156
Site(gNB) ID	8108

Configuration: gNB DU

	\square	gNB DU	
Provision Method	⊖Remote ⊙	Local	
SST	1		
sD	Enabled	v 66051	

There are many items in the DU configuration tab; they can be split by Common Items, Bandwidth Profile, NR ARFCN Profile, and Time Slot Profile.

Figure 37. The Askey 5G NR Small Cell DU Configuration – Common Items

Configuration: gNB DU

	gNB DU	
Provision Method	◯ Remote ④ Local	
SST	1	\mathbb{R}^{2}
SD	Enabled ~ 66051	
NR Band	77	~
Physical Cell ID	112	
Uplink Layer	One Layer O Two Layers	
UL Dmrs-AdditionalPosition	O Position 1 Position 2	
QRxLevMin	-50	
QQualMin	-30	

Table 15. The Askey 5G NR Small Cell DU Configuration – Common



Items	Descriptions
SST	Slice/Service Type, refers to the expected Network Slice behavior in terms of features and services
SD	Slice Differentiator, complements the SST to differentiate amongst multiple Network Slices of the same SST. The SD value can be disabled for the standardized S-NSSAI that has only SST.
NR Band	Frequency bands for 5G New Radio. It supports the N48, N77
Physical Cell ID	Physical Cell identifier, is used to distinguish cells on the radio side. The value must be small than 512.
Uplink Layer	The channel over which a symbol on the antenna port is conveyed can be inferred from the channel over which another symbol on the same antenna port is conveyed.
UL Dmrs-AdditionalPosition	Position for additional demodulation reference signal (DMRS) in uplink.
QRxLevMin	Minimum required RX level in the cell (dBm)
QQualMin	Minimum required quality level in the cell (dB)

If the device supports the NR Band 48, the SAS Provider item will display in the CU configuration as the NR band is modified to 48.

Figure 38. The Askey 5G NR Small Cell DU Configuration – Bandwidth Profile

Configuration: gNB DU

	gNB DU	
Provision Method	◯ Remote ④ Local	
SST	1	
SD	Enabled ~ 66051	
NR Band	48 ^	
Physical Cell ID	✓ 48	

Figure 39. The Askey 5G NR Small Cell DU Configuration – SAS Provider



Configuration: gNB CU

	gNB CU	
Provision Method	C Remote Local	
SAS Provider	Federated Wireless	
Site(gNB) ID	Disable	
gNB ID Length	 Federated Wireless 	
34949-1970-3797	Google	
Cell ID		

After rebooting the 5G NR Small Cell, the device will perform the normal SAS-CBSD procedures. The related messages can be captured by Wireshark with the following capture filter:

host 10.1.108.156 and udp port 17054



For check the content of the SAS-CBSD procedures, you can click the right mouse on the raw data and choose the item "**Show Packet Bytes**".



9 208.575108 10.1.108.156 10 398.852897 10.1.108.156	Colorize with Filter Follow	;
11 401.092249 10.1.108.156	Сору	•
12 591.468558 10.1.108.156	Show Packet Bytes Ctrl+1	shift+0
14 783.643482 10.1.108.156	Export Packet Bytes Ctrl+1	shift+X
15 785.694379 10.1.108.156	Wiki Protocol Page	
> Frame 1: 814 bytes on wire (6512 bits), 814 t	Filter Field Reference Protocol Preferences	,
<pre>> Ethernet II, Src: AskeyCom_da:S0:a2 (4c:ab:+E > Internet Protocol Version 4, Src: 10.1.108.15</pre>	Decode As Ctrl+5	Shift+U
User Datagram Protocol, Src Port: 40933, Dst	Go to Linked Packet	
Data (772 bytes)	Show Linked Packet in New Window	
Data: 7b22726567697374726174696f6e52657175b	17574225a0a2020202056760a20202020	-85
[Length: 772]		

The message content will be displayed on the new window of the Wireshark as the following illustration: Wireshark · Data (data.data) · WAN (host 10.1.108.156 and udp port 17054)

```
{"registrationRequest":
    [{
        "cbsdSerialNumber":"84301498175650",
        "fccId":"Askeyfccid22A",
        "userId":"MdwtmV",
        "cbsdCategory":"A",
        "airInterface":{
            "radioTechnology":"NR"
        },
        "measCapability":[""],
        "installationParam":{
            "latitude":62.5,
            "longitude":-155.5,
            "heightType":"AGL",
            "height":1.0,
            "antennaGain":5,
            "eirpCapability":29,
            "indoorDeployment":true
        },
        "cbsdInfo":{
            "vendor": "Askey Corporation",
            "model":"SCE2120",
            "softwareVersion": "v2.2.008.685",
            "hardwareVersion":"SCE2120_ES0",
            "firmwareVersion":"0.4.6.48.ev0"
        }
    }]
}
```

In the bandwidth and NR ARFCN configurations, the Admin Website provides the supported item for each NR band. After choosing the profile option, the recommended values will be filled in the related items. For the more configurations, you can read the Chapter "**The Recommend NR ARFCN Configuration**" in the bottom of this document.



For the NR ARFCN, the Admin Website provide some profile options, and the recommended values will be filled in the related items. For the more configurations, you can read the Chapter "**The Recommend NR ARFCN Configuration**" in the bottom of this document.

Figure 40. The Askey 5G NR Small Cell DU Configuration – NR ARFCN

NR ARFCN

Profile	3.52G	~
DL NR ARFCN	635208	
UL NR ARFCN	635208	
DL CenterFreq	3528120	
UL CenterFreq	3528120	
DL AbsArfcnPointA	633936	
UL AbsArfcnPointA	633936	
DL AbsFreqPointA	3509040	
UL AbsFreqPointA	3509040	
AbsArfcnSsb	634464	
AbsFreqSsb	3516960	



Items	Descriptions
Bandwidth Profile	N48 : 20/30/40 MHz
	N77 : 40/50/60/70/80/90/100MHz
ARFCN Profile	It provides the recommended ARFCN configuration
DL NR ARFCN	The downlink NR ARFCN of the whole bandwidth
UL NR ARFCN	The uplink NR ARFCN of the whole bandwidth
DL CenterFreq	The downlink center frequency value in KHz
UL CenterFreq	The uplink center frequency value in KHz
DL AbsFreqPointA	The downlink absolute frequency point A configuration in KHz
UL AbsFreqPointA	The uplink absolute frequency point A configuration in KHz
DL AbsArfcnPointA	The downlink absolute ARFCN point A configuration
UL AbsArfcnPointA	The uplink absolute ARFCN point A configuration
AbsFreqSsb	The absolute frequency SSB configuration in KHz
AbsArfcnSsb	The absolute ARFCN SSB configuration

Table 16. The Askey 5G NR Small Cell DU Configuration – Bandwidth and NR ARFCN

For the Time Slot Format, the Admin Website provides some typical profiles and the recommended value of the related items. You can click the profile option, and the related values will be filled in these detailed items.

Figure 41. The Askey 5G NR Small Cell DU Configuration – Time Slot Profile

Time Slot Format

Profile	DDDSU(4:1)	^
NumDiSlot	User Specific	ĺ
NumDISiotP2	🐱 DODSU(4:1)	
	DDSUU(3:2)	
NumDISymbol	DSUUU(2:3)	
NumDISymbolP2	DDDSUDDSUU(7:3)	
	PERSONAL PROPERTY AND A PROPERTY AND	

Figure 42. The Askey 5G NR Small Cell DU Configuration – Time Slot Parameters



Time Slot Format

Profile	DDDSU(4:1)
NumDISlot	3
NumDISlotP2	0
lumDISymbol	10
NumDISymbolP2	0
NumUISlot	1
NumUISlotP2	0
lumUISymbol	2
lumUlSymbolP2	0
P2 Pres	0
PrachCfgldx	159
PreambleFormat	RACH_FORMAT_B4



Items	Descriptions
Profile	List the common time slot patterns and provide the default value for detailed setting
numDISlot	The number of downlink slots
numDISlot2	The number of P2 downlink slots
numDISymbol	The number of downlink symbols for slot format
numDISymbolP2	The number of P2 downlink symbols for slot format
numUISlot	The number of uplink slots
numUISlotP2	The number of P2 uplink slots
numUlSymbol	The number of uplink symbols for slot format
numUISymbolP2	The number of P2 uplink symbols for slot format
p2Pres	The Pattern 2 (P2) presence value
PrachCfgldx	The PRACH configuration index value
PreambleFormat	Long preamble: Format 0, 1, 2, and 3 Short preamble: Format A1, A2, A3, B1, B2, B3, B4, C0, and C2

Table 17. The Askey 5G NR Small Cell DU Configuration – Time Slot Format

In the NR ARFCN and Time Slot Format configurations, the detailed items will be read-only for the predefined profile. If the user wants to modify the detailed items, the profile should be selected to **"User Specific"**.

Profile	User Specific	v
DL NR ARFCN	635208	
UL NR ARFCN	635208	
Time Slot Format		
Profile	User Specific	÷
NumDiSlot	3	
NumDISlotP2	a	

NR ARFCN



3.5.3 Neighbor Cell

This Askey 5G NR Small Cell Neighbor Cell displays the related gNB information, and you can modify some items in the local provision. You can also manually add the neighbor cell on the page's bottom. These items will be read-only if the device is under remote provisioning.

Figure 43. The Askey 5G NR Small	Il Cell Neighbor Cell Page
----------------------------------	----------------------------

contral.	Cont	figura	tion	: Neighbor	Cell	
onnected Devices	aNB IP			10.1.108.156		
ttings		641				
iguration	gNB NR Ba	nd		77		
hoard	gNB AbsAr	fonSøb		647232		
00410	gNB AbsAr	fcnPointA		DL: 646704 UL: 645704		
	Provision M	lethod		Local		
bor Cell	NeighborCa	il AbsArfonS	sb	647232		
Intenna		2017		1. 1.		
i.	A3 RSRP 0	ffset		3		
	A3 Hystere	ais.		0		
louting	A3 Timer To	Trigger		MS40	v	
	XN Enal	ble				
2						
	Neighbo	r Cell				
	gNB ID	Cell ID	PCI	AbsArfonPointA	Action	

If the XN Enable is checked, you can choose the server or client side for Xn handover. You should also provide the XN neighbor IP address as the following illustration:



👿 XN Enable	Server Side	v
XN Neighbor IP	10.1.108.111	

You can add the neighbor cell by clicking the **Add** button in the Action column and fill the neighbor data on the popup window.

Handover Type	Intra Handover	
Neighbor gNB ID	0	
Neighbor gNB ID Length	22	
Neighbor Cell ID	0	
Neighbor PCI	0	
Neighbor TAC	8	
Neighbor NR Band	\overline{n}	
DL AbsArfonPointA	646704	
UL AbsArfonPointA	646704	

The gNB ID, gNB ID Length, and Cell ID cannot all be the same value as another neighbor cell. It should be noted that the Askey 5G NR Small Cell currently doesn't support the inter handover if the **Neighbor NR Band** or the **AbsArfcnPointA** is not the same as the gNB.



Handover Type Inter Handover

The max number of neighbor cells is 4, and you can perform the delete or edit action to adjust the neighbor cells.

Neighbor Cell

gNB ID	Cell ID	PCI	AbsArfonPointA	Action
704	12	112	DL : 646704 UL : 646704	Delete
480	4	74	DL : 630480 UL : 630480	Delete Edit
112	1	1	DL : 646704 UL : 646704	Delete
210	10	1	DL : 646704 UL : 646704	Delete
				Add

Table 18. The Askey 5G NR Small Cell Neighbor Cell Configuration

Items	Descriptions
NeighborCell AbsArfcnSsb	The absolute ARFCN point A configuration of the neighbor cell
A3 RSRP Offset	The Reference Signal Received Power (RSRP) offset of event A3. The number range is -30 to 30 (dB).
A3 Hysteresis	The hysteresis value of event A3. The number range is 0 to 30 (dB).
A3 Timer To Trigger	The timer helps to avoid irregular measurement and handover. Support the following items: MS0, MS40, MS64, MS80, MS100, MS128, MS160, MS256, MS320, MS480, MS512, MS640, MS1024, MS1280, MS2560, MS5120
XN Enable	If checked, the device will enable the Xn handover. It needs to choose the server or client side for Xn handover
XN Neighbor IP	The IP address of the peer gNB on the Xn interface

3.5.4 RF Antenna

This Askey 5G NR Small Cell RF Antenna page allows users to modify the max TX power and the RF antenna path.

Figure 44. The Askey 5G NR Small Cell RF Antenna Page



Configura	tion: RF Ant	enna
PE Dower	014	
in rolla	1.40	
Max TX Power	24.0	(dBm)
Antenna Path	Internal	*
		Cancel
	Configura RF Power Max TX Power Antenna Path	Configuration: RF And RF Power 0N Max TX Power 24.0 Antenna Path Internal

The RF Power will be N/A if the Askey 5G NR Small Cell isn't in service.

Configuration		
RF Power	N/A	*

After the cell state is in service, you can turn off the RF power. In the meantime, the MAX TX power will be read-only.

	Configura	tion: RF Antenna	
	RF Power	OFF	~
	Max TX Power	24.0	(dBm)
This max T	X power is the numb	er in one decimal place, and the ra	ange is from 0.0 to 24.0
	Max TX Power	0.0	(dBm)
		The tournbole carge is 0 to 24	

This antenna path can be **Internal** or **External**. If the antenna path is switched to External, the RF signal will be transmitted through the **external** antenna connector as the illustration:

External antenna ports ANT1/ANT2 are disabled via software for this model and is not modifiable by any third-party / end-user.





3.5.5 VLAN

This Askey 5G NR Small Cell VLAN page allows users to create, read, update and delete the VLAN (Virtual Local Area Network) configurations.

Figure 45. The Askey 5G NR Small Cell VLAN Page

Connected Device	s :	Q.		114953	0012121		
		Interface		tm1-mac9 - WAN			.*
settings		VLAN Interface	Tag ID	DHCP	IP Address		Action
Configuration	Ċ.	fm1-mac9-vfan5	5	NO	192.148.2.12	Delete	Edit
Dashboard		fm1-mac9-vfan22	22	YES	0.0.0	Delete	Edt
gNB		tm1-mac9-vlan23	23	NO	192.158.1.22	Delete	Edit
Neighbor Cell						(Add
RF Antenna							
0.44							

At first, you should choose which physical network interface the VLAN attaches. When the interface is changed, the related VLAN configurations attached on the physical network interface will be displayed on the page.

Interface			fini1-mars - WAN	
VLAN	Interface	Teg ID	🛩 fm1-mac9 - WAN	
fm1-m	ac9 vlan5	5	fm1-mac10 - SFP+	

Figure 46. The Askey 5G NR Small Cell VLAN Page – Read Operation

Configuration: VLAN

Interface	fm1-mac10 - SFP+			
VLAN Interface	Tag ID	DHCP	IP Address	Action
fm1-mac10-vlan12	12	YES	0.0.0.0	Delete Edit
				Add

Click the **Add** button will prompt a window to create a new VLAN attached to the physical network interface. The DNS configurations are optional for the VLAN with static IP. If the DHCP is enabled, add the ignore default route option Ignore **Routes**.

Figure 47. The Askey 5G NR Small Cell VLAN Page – Create Operation



Add VLAN

Interface	fm1-mac10 - SFP+	
Tag ID		
IP Address		
Subnet Mask		
Default Gateway		
Primary DNS		
Secondary DNS		
	Cancel Save	

Click the **Edit** button in the VLAN list will prompt a window to update the specified VLAN configuration. *Figure 48. The Askey 5G NR Small Cell VLAN Page – Update Operation*

Configuration: VLAN Interface fm1-mac10-SFP+ VLAN Interface Tag ID DHCP IP Address Action

APAN menace	sag in	nuce	IP AQUIESS	AC	lon
fm1-mac10-vlan5	5	NO	192,168.100.80	Delete	Edit
fm1-mac10-vlan12	12	YES	0.0.0.0	Delete	Edit



Edit VLAN

fm1-mac10-vlan5	
5	
192.168.100.6d	
255.255.255.0	
	fm1-mac10-vlan5 5 [192.168.100.60] [255.255.255.0

In addition, if the VLAN tag ID has existed in the create operation, it will become an update operation that will update the previous VLAN configuration with the tag ID.

Click the **Delete** button in the VLAN list will delete the specified VLAN configuration. It doesn't need to restart the device for the delete operation.

Figure 49. The Askey 5G NR Small Cell VLAN Page – Delete Operation



Configuration: VLAN

Interface		fm1-ma	c10 - SFP+		~
VLAN Interface	Tag ID	DHCP	IP Address	•	ction
fm1-mac10-vlan5	5	NO	192.168.100.60	Delete	Edit
fm1-mac10-vlan12	12	YES	0.0.0.0	Delete	Edit

3.5.6 Static Routing

This Askey 5G NR Small Cell Static Routing page shows the current routing table and allows users to define the static routing rules. The commands in the static routing rules need to be started with "**ip route**"; otherwise, the command will be ignored.

Figure 50. The Askey 5G NR Small Cell Static Routing Page

Home	Configuration: Static Routing			
Connected Devices				
Sattings	Routing Table :			
onungo	default via 18.1.106.1 dev fm1-mac9 proto dhcp src 10.1.188.156 metric 180 10.1.104.0/21 dev fm1-mac9 proto kernel scope link src 10.1.188.156			
Configuration	10.1.105.1 dev fm1-mac9 proto dhcp scope link src 10.1.100.156 metric 100 192.148.0.0/24 via 192.158.0.0 dev fm1-mac9-vlan23			
Dashboard	192.168.66.9 dev fml-mac9-vlan5 scope link			
gNB	Static Routing :			
Neighbor Cell	ip route add 192.168.66.9 dev fm1-mac9-vlan5 Ip route add 192.158.0.0/24 dev fm1-mac9-vlan23 ip route add 192.140.0.0/24 via 192.158.0.0 dev fm1-mac9-vlan23			
RF Antenna				
VLAN				
Static Poution	Cancer			



3.5.7 Version

This Askey 5G NR Small Cell Version page shows the current software, hardware, and web version. In Addition, you can upload an encoded installer with matched access code to perform a local upgrade of the Askey 5G NR Small Cell.

lome	Configuratio	on: Version
Connected Devices	Software Version	SCE2120 (NSC-Dual-Sub6-GA-RED3)
ettings	Hardware Version	0.47.0.70
configuration ^	Web Version	v3 6 5010
ashboard		
NB	Choose Software Installer	Chodsel rile No file chosen
leighbor Cell	Input The Access Code	
F Antenna		Upload
LAN		

Firstly, you need to choose the encrypted software installer and input the access code provided by Askey. The installer will be uploaded to the DUT after clicking the Upload button.



Choose Software Installer	Choose File	nsc2 2_dual_alo.009ga-r0es0es1ev1 installer enc
Input The Access Code	8168b7fe0e	454eb66720383213db6d227f9ca9bd5dd9a26e
0%		Upload

There is a progress bar to indicate the upload processing progress. When the progress is 100%, the API server will concatenate the chunked upload files and check the access code.

Choose Software Installer	Choose File nsc2.2_dual_aio.009ga-r0es0es	1 ev1.installer.enc
Input The Access Code	8168b7fe0e454eb66720383213db6d227f9ca9	bd5dd9a26e
19%)		Upload

If the access code is wrong, the Admin Website will provide a warning message as the following illustration. Please check the access code and upload it again with the correct code.

SINEY G é					
			×		
	The access code is wrong				
71c			ОК		
		Upload			

If the access code is correct, the Admin Website will pop-up a message as the following illustration to indicate the upload is successful and the Askey 5G NR Small Cell will start to upgrade the software.





In the meantime, the API server is decoding the installer and perform the local upgrade. Therefore, if you click the "OK" button, the Web GUI cannot do other operations as in the following illustration. After finishing the upgrade, the Admin Website will provide another message as the following illustration.



Finally, when the Admin Website provides the following message, the Askey 5G NR Small Cell startup procedure is finished. Click the "OK" button will redirect to the login form to access the Admin Website.





3.6 About

3.6.1 GPS

This Askey 5G NR Small Cell GPS Page shows the GPS status, including GPS Satellite ID, signal quantities, description, etc.

Figure 52. The Askey 5G NR Small Cell GPS Page



- 1	L	L	-	n		
. 1	e.		u	 	5	
			-		-	

About: GPS

Connected Devices

e,	 inn		

Configuration

About

GPS

GPS

÷

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*

A minimum of four satellites are required to provide a GPS location fix. Please place the SG NR Small Cell's GPS antenna in a location where there are at least four strong satellite signals in the table below.

GPS Status : Location Acquired Q Map

Last Data Refresh 02-27-2023 12:33:00 (UTC+8) This page will refresh every 15 seconds.

MSL Altitude : 65.2 m

GPS Satellite ID	GPS Signal Quality (dB)	Description
27	40	Strong
8	38	T Strong
195	38	Strong
194	36	E Strong
4	36	Strong
16	35	Strong
301	34	E Strong
199	33	E Strong
326	33	E Strong
9	33	E Strong
31	33	E Strong
321	31	Strong
26	31	E Strong
21	30	Fait
7	30	E Fair

Strong / 31-99

Fair / 20-30

Weak / 0-19



Table 19. The Askey 5G NR Small Cell GPS

Items	Descriptions
Last Data Refresh	The local time when this page was last refreshed.
Last Data Refresh	The local time when this page was last refreshed.
GPS Status	This indicates if The Askey 5G NR Small Cell has acquired GPS signals or not. The Askey 5G NR Small Cell will not come into service if the status does not say "Location Acquired".
GPS Satellite ID	The list of GPS satellites identifies how many satellites are currently being detected along with each satellite's unique identifier.
GPS Satellite Quality (dB)	This value describes the signal-to-noise ratio for the GPS signal. A higher value means better quality. If the description is either Fair or Weak, you should consider repositioning the unit or GPS antenna. If the signal quality does not improve, an external GPS antenna may be required.
Description	Describes the quality level of the satellite signal as either: Strong, Fair or, Weak. Refer to the legend for the mapping.





Chapter 4 The Askey 5G NR Small Cell Support Utilities

4.1 Small Cell Log Download Mechanism

You can download the runtime or backup log files by the following HTTPS linking URL and send them back to the Askey Small Cell team to analyze.

PS:

- 1. Please don't modify the downloaded file name
- 2. Please don't download two log files at the same time

Backup Log Illustration: (The max page size is 3)





Runtime Log:

https://<ip address>/api/logs/TwpEceURn15qxDYSW88IJddB7LAsiOr64HNg

Backup Log:

https://<ip address>/api/logs/TwpEceURn15qxDYSW88IJddB7LAsiOr64HNg/<page size>

https://<ip address>/api/logs/TwpEceURn15qxDYSW88IJddB7LAsiOr64HNg/<page size>/<page no>

Examples:

https://10.1.108.15/api/logs/TwpEceURn15qxDYSW88IJddB7LAsiOr64HNg
→ Runtime log: askeylog_280375459184643_20221025-092816_nsc.tgz.enc

https://10.1.108.15/api/logs/TwpEceURn15qxDYSW88IJddB7LAsiOr64HNg/3 → Backup log (page size 3, page no 1): askeylog_280375459184643_20221025-092825_nsc_last_01-03.tgz.enc

https://10.1.108.15/api/logs/TwpEceURn15qxDYSW88IJddB7LAsiOr64HNg/3/3 → Backup log (page size 3, page no 3): askeylog 280375459184643 20221025-092902 nsc last 07-09.tgz.enc



4.2 Access the Admin Website by IPv6 Link-Local Address

If the network setting of the Askey 5G NR Small Cell is wrong or you cannot get the current IP address, you cannot access the Admin Website by IPv4. You can use the MAC to IPv6 Converter

(https://nettools.club/mac2ipv6) to get the link-local address of the Askey 5G NR Small Cell. After that, you can access the Admin Website by the URL http://[IPv6 Link-Local Address]/ in the same LAN.

For example, if the MAC address is "FE:FF:A6:00:03", you can get the following result by converter.

Just fill in one of the fields and the second will update automatically.					
	MAC Address:				
	FE:FF:FF:A6:00:03				
	IPv6 Link-local:				
	fe80::fcff:ffff:fea6:3				

Then, you can access the Admin Website by the URL http://[fe80::fcff:ffff:fea6:3]/ in the same LAN. If you access the Admin Website by the method for the first time, it may need more than one time refresh to finish the IPv6 Neighbor Discovery.



4.3 The Recommend NR ARFCN Configuration

5G Sub6G Band N48

NR ARFCN Profile	40 MHz 3.57G	30 MHz 3.56G	20 MHz 3.62G	
DL Earfcn	637992	637656	641652	
UL Earfcn	637992	637656	641652	
DL CenterFreq	3569880	3564840	3624780	
UL CenterFreq	3569880	3564840	3624780	
DL AbsArfcnPointA	636720	636720	641040	
UL AbsArfcnPointA	636720	636720	641040	
DL AbsFreqPointA	3550800	3550800	3615600	
UL AbsFreqPointA	3550800	3550800	3615600	
AbsArfcnSsb	637248	636960	641280	
AbsFreqSsb	3558720	3554400	3619200	



5G Sub6G Band N77, 100MHz Bandwidth

NR ARFCN Profile	3.75G	3.675G		
DL Earfcn	649980	647772		
UL Earfcn	649980	647772		
DL CenterFreq	3749700	3716580		
UL CenterFreq	3749700	3716580		
DL AbsArfcnPointA	646704	644496		
UL AbsArfcnPointA	646704	644496		
DL AbsFreqPointA	3700560	3667440		
UL AbsFreqPointA	3700560	3667440		
AbsArfcnSsb	647232	645024		
AbsFreqSsb	3708480	3675360		

5G Sub6G Band N77, 90MHz Bandwidth

NR ARFCN Profile	3.75G	3.75G	3.6G	4.05G	
DL Earfcn	649644	649836	640044	669996	
UL Earfcn	649644	649836	640044	669996	
DL CenterFreq	3744660	3747540	3600660	4049940	
UL CenterFreq	3744660	3747540	3600660	4049940	
DL AbsArfcnPointA	646704	646896	637104	667056	
UL AbsArfcnPointA	646704	646896	637104	667056	
DL AbsFreqPointA	3700560	3703440	3556560	4005840	
UL AbsFreqPointA	3700560	3703440	3556560	4005840	
AbsArfcnSsb	647232	647424	637632	667584	
AbsFreqSsb	3708480	3711360	3564480	4013760	


5G Sub6G Band N77, 80MHz Bandwidth

NR ARFCN Profile	4.05G		
DL Earfcn	669996		
UL Earfcn	669996		
DL CenterFreq	4049940		
UL CenterFreq	4049940		
DL AbsArfcnPointA	667392		
UL AbsArfcnPointA	667392		
DL AbsFreqPointA	4010880		
UL AbsFreqPointA	4010880		
AbsArfcnSsb	667968		
AbsFreqSsb	4019520		

5G Sub6G Band N77, 70MHz Bandwidth

NR ARFCN Profile	3.587G		
DL Earfcn	639180		
UL Earfcn	639180		
DL CenterFreq	3587700		
UL CenterFreq	3587700		
DL AbsArfcnPointA	636912		
UL AbsArfcnPointA	636912		
DL AbsFreqPointA	3553680		
UL AbsFreqPointA	3553680		
AbsArfcnSsb	637440		
AbsFreqSsb	3561600		



5G Sub6G Band N77, 60MHz Bandwidth

NR ARFCN Profile	3.675G	3.6966G	4.05G	
DL Earfcn	645000	646440	670008	
UL Earfcn	645000	646440	670008	
DL CenterFreq	3675000	3696600	4050120	
UL CenterFreq	3675000	3696600	4050120	
DL AbsArfcnPointA	643056	644496	668064	
UL AbsArfcnPointA	643056	644496	668064	
DL AbsFreqPointA	3645840	3667440	4020960	
UL AbsFreqPointA	3645840	3667440	4020960	
AbsArfcnSsb	643584	645024	669312	
AbsFreqSsb	3653760	3675360	4039680	

5G Sub6G Band N77, 50MHz Bandwidth					
NR ARFCN Profile	3.587G				
DL Earfcn	639180				
UL Earfcn	639180				
DL CenterFreq	3587700				
UL CenterFreq	3587700				
DL AbsArfcnPointA	637584				
UL AbsArfcnPointA	637584				
DL AbsFreqPointA	3563760				
UL AbsFreqPointA	3563760				
AbsArfcnSsb	638112				
AbsFreqSsb	3571680				



5G Sub6G Band N77, 40MHz Bandwidth

NR ARFCN Profile	3.75G	4.05G		
DL Earfcn	649896	670008		
UL Earfcn	649896	670008		
DL CenterFreq	3748440	4050120		
UL CenterFreq	3748440	4050120		
DL AbsArfcnPointA	648624	668736		
UL AbsArfcnPointA	648624	668736		
DL AbsFreqPointA	3729360	4031040		
UL AbsFreqPointA	3729360	4031040		
AbsArfcnSsb	649152	669312		
AbsFreqSsb	3737280	4039680		

SKEY COMPUTER CORPORATIO