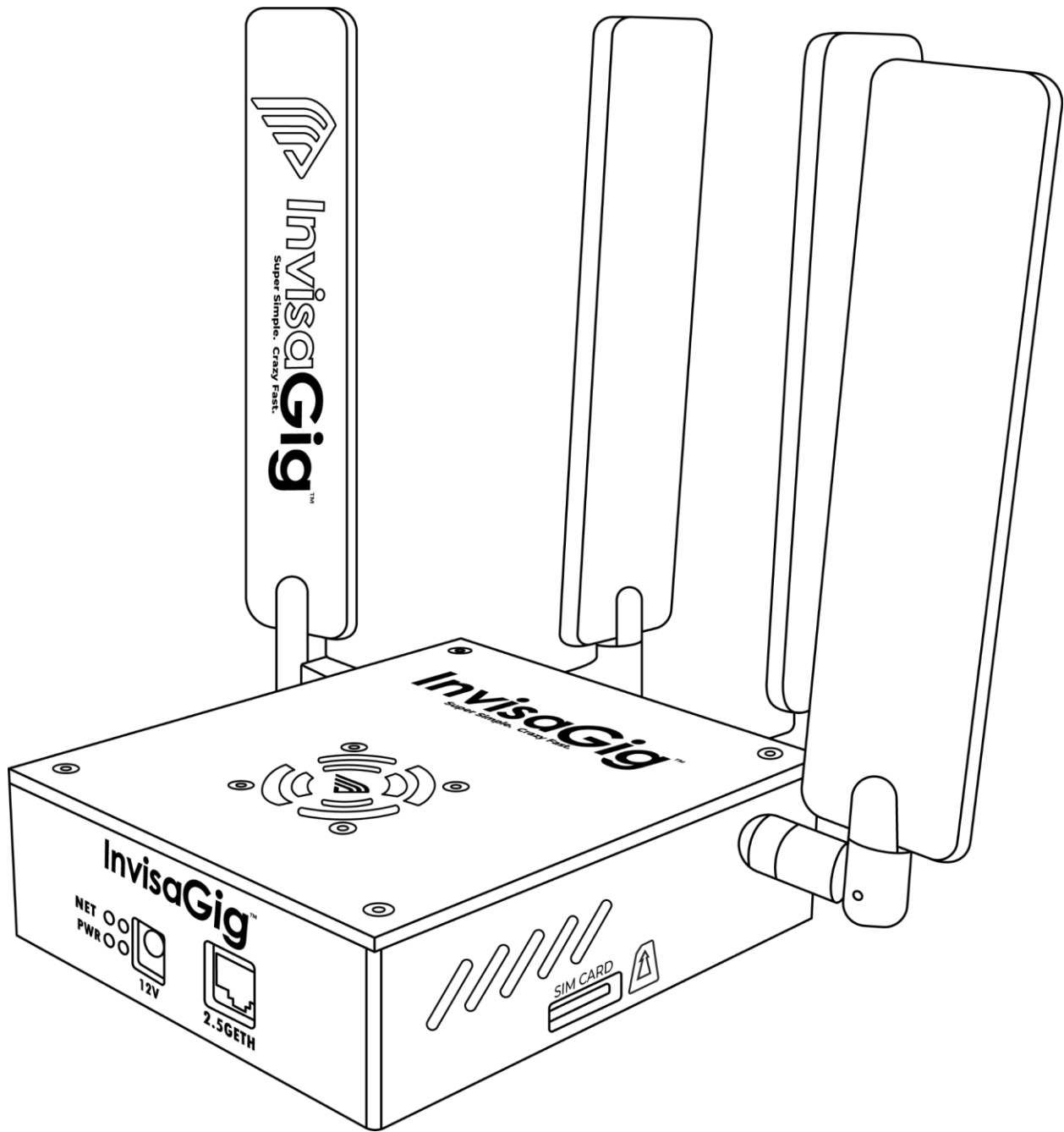


# InvisaGig™

Super Simple. Crazy Fast.

## User Manual



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## Hardware Overview

### Package Contents

- InvisaGig Unit
- Ethernet Cable
- SIM Card Adapter Set
- Power Supply
- 4x Detachable Antennas

### Specifications

**Operating Temperature:** Min. -30c, Typ. 25c, Max. 75c

**Operating Environment:** Main Unit is designed for indoor operation. Proper clearance should be given all around the unit for proper airflow

**Supported Ethernet Transfer Rates:** 10/100/1000/2500Mbps

#### Supported LTE Bands:

B1/B2/B3/B4/B5/B7/B8/B12/B13/B14/B17/B18/B19/B20/B25/B26/B28/B29/B30/B32/B34/B38/B39/B40/B41/B42/B43/B46/B48/B66/B71

#### Supported 5G NR Bands:

n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/n20/n25/n26/n28/n29/n30/n38/n40/n41/n48/n66/n70/n71/n75/n76/n77/n78/n79

### Assembly

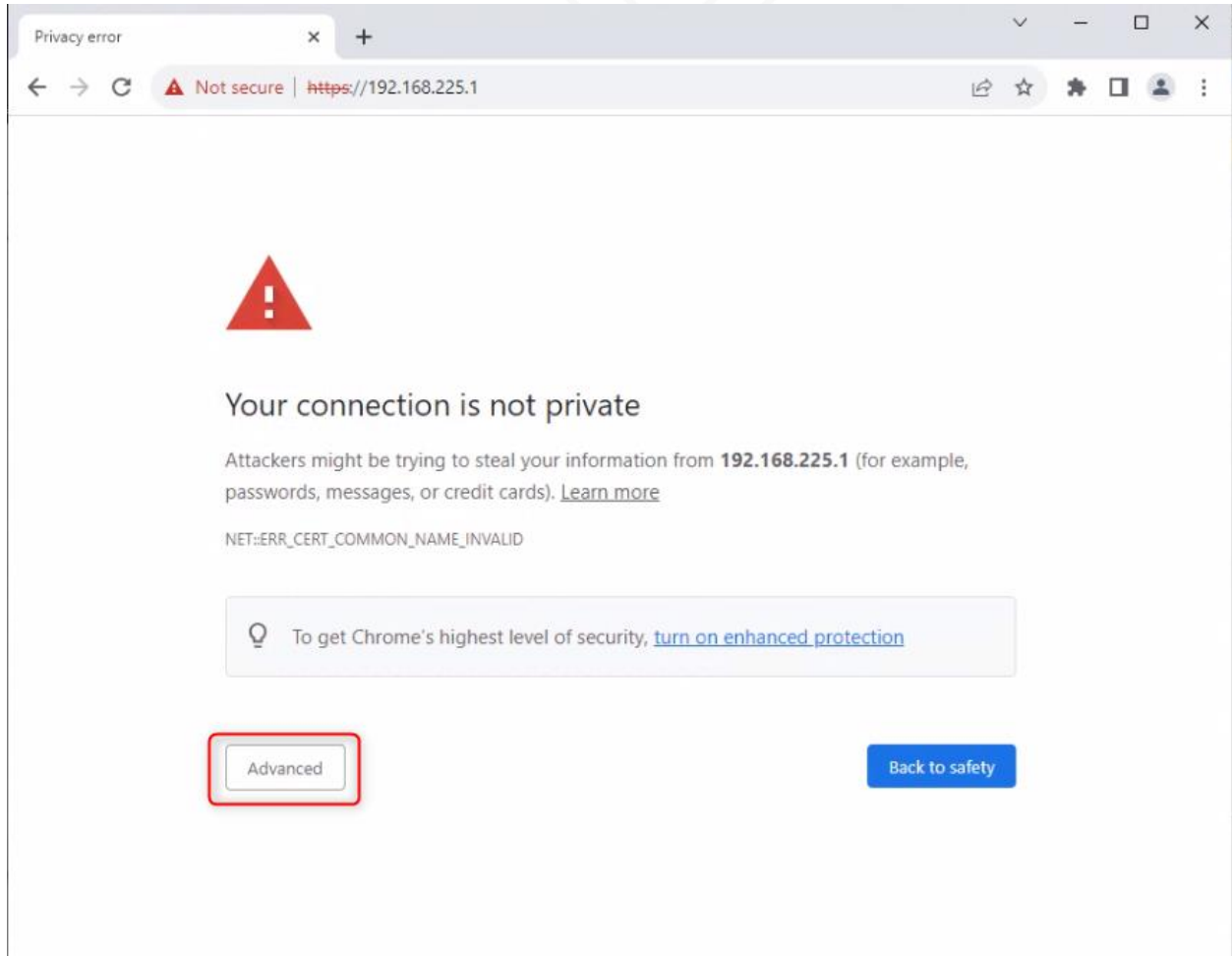
Once all package contents have been checked, the unit can be assembled. In the case of external antennas, begin by attaching all 4 antennas to the unit by screwing them onto the 4 threaded, SMA connectors of the InvisaGig main unit, clockwise until tight. Take care not to cross thread or overtighten the antennas; they should be hand-tightened only, do NOT use any tools as this may damage the unit and/or antennas.

Once the antennas are connected, insert your SIM card into the unit. Be sure that the SIM card is oriented correctly when inserted with the metal contacts in the downward position. At this point you can connect the Ethernet cable between the Ethernet port of the InvisaGig unit and your PC or router's WAN/Internet port. Finally, once the antennas are connected, SIM is inserted, and Ethernet is connected, you can plug in the DC barrel connector from the power supply into the power port of the unit to power it on. The unit will take a minute or two to power up.

## Software Overview

### First Time Configuration Interface Access

Once the InvisaGig unit is connected to your device via Ethernet, navigate to <https://192.168.225.1> and click through to accept the security warning in your browser. In Chrome this is done by clicking 'Advanced' then 'Proceed to 192.168.225.1':



Hide advanced

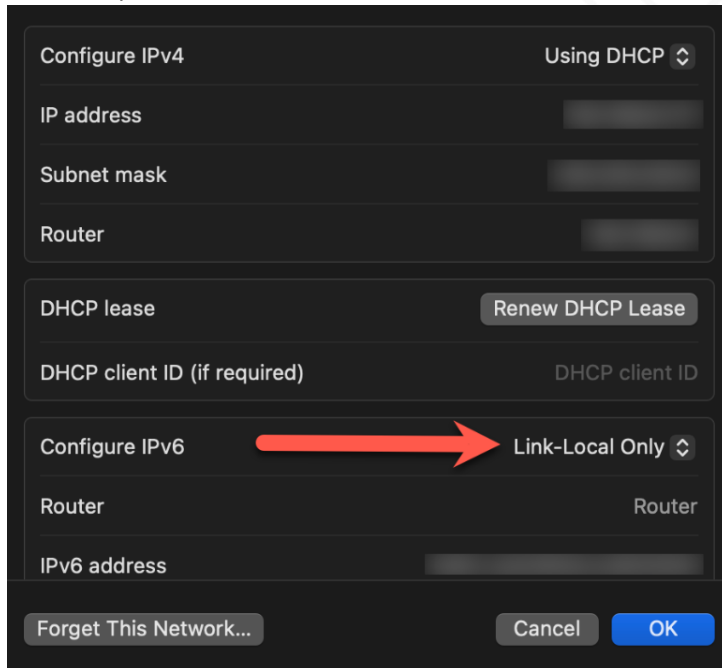
Back to safety

This server could not prove that it is **192.168.225.1**; its security certificate is from **config.invisagig.com**. This may be caused by a misconfiguration or an attacker intercepting your connection.

Proceed to 192.168.225.1 (unsafe)

### \*\*\*MacOS Note\*\*\*

It has been observed that some versions of MacOS can have issues accessing the InvisaGig when IPv6 is enabled, and the unit is connected directly to the Mac. To avoid this issue, navigate to “System Settings... > Network” then select your Ethernet or USB-to-Ethernet adapter from the list of network connections on the left. Click on “Details... > TCP/IP” then select “Link-Local Only” from the “Configure IPv6” dropdown menu:



### Installing InvisaGig Certificates (OPTIONAL)

If you do not want to click past browser security warnings when accessing the configuration page from a new device, you can download the InvisaGig root and/or configuration page certificates to your device for installation directly from the device over HTTP:

<http://192.168.225.1/rootcert>

<http://192.168.225.1/cert>

We also provide Windows and MacOS native scripts to install the certs and set convenient local hosts file entries for the configuration page if you prefer to access units via hostname instead of IP address (i.e. 'https://config.invisagig.com'). A .zip archive containing these scripts, a copy of the certificates that they install, and a README with instructions on use can be downloaded directly from the device over HTTP:

<http://192.168.225.1/scripts>

**NOTICE:** Neither manual nor scripted installation of any certificate is required to access the InvisaGig's configuration page via IP address. We simply provide them to those who wish to remove the browser security warnings. Please note that use of any custom LAN IP would likely still produce insecure connection warnings by your browser as we cannot anticipate all custom IPs which may be assigned to the unit.

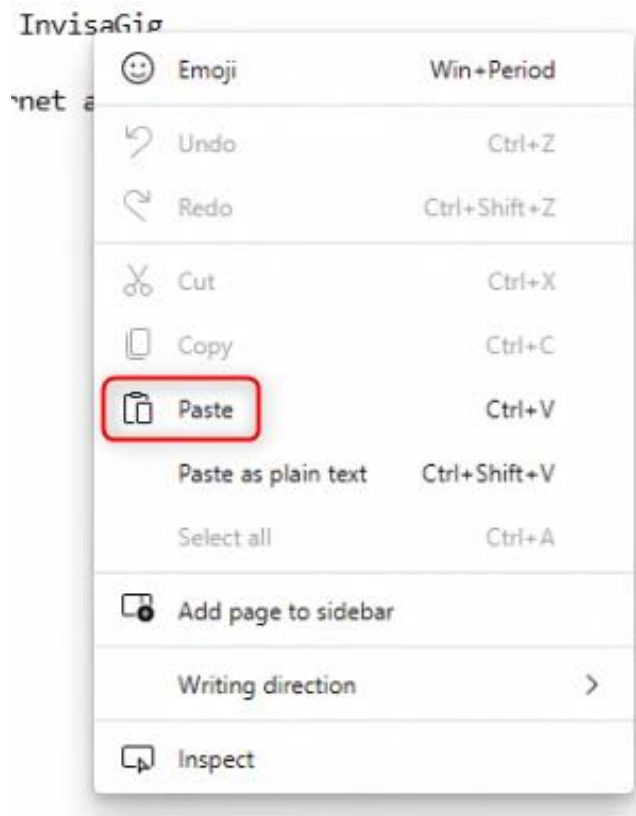
## Configuration Interface

### Accessing the Configuration Interface

By default, the configuration interface can be accessed at <https://192.168.225.1>.

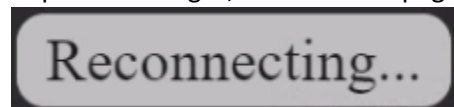
### Option Selection and Input

The menu is driven by text input provided by the user. To select an option, input its corresponding menu number and press [Enter]. For options which require extended input, you can simply copy and paste text as you can in most other computer applications. Paste is accomplished by right-clicking in the browser window displaying the menu interface, right-clicking the mouse, and selecting 'Paste':



### Access Interruptions During Network Changes

Be aware that when executing certain configuration menu options, the browser may temporarily lose connection to the Configuration Interface as it commits network changes internal to the device. For less impactful changes, the interface page may show a "Reconnecting..." message like the one below:



In many cases the connection will then restore itself and you will be returned to the Landing Menu. During more impactful changes (i.e., Cell Locks, reboots, etc.) the automatic reconnection attempts may

time out and drop you to a “Press [Enter] to Reconnect” message like the one below:



In such case, press [Enter] to reconnect as instructed. If the device is still processing networking changes you may have to wait 30-60 seconds before retrying access. If no reconnection status messages are displayed simply use the refresh function on your browser to manually reload the page. Upon reconnection you will be returned to the Landing Menu.

## Landing Menu

This is the initial menu observed when accessing the configuration page:

```
1) Login
2) Modem Info
3) Live Signal
Please enter your choice: █
```

### Login

Selecting this option will prompt for a password and log you into the Main Menu. The default password delivered by default is “**ChangeME2\$**”. This should be changed with the “Change Password” option in the Main Menu.

```
Enter the password:
***** █
```



## Modem Info

Modem info displays all relevant information about the current state of the modem, cellular carrier, and current configuration:

```
INTERNET STATUS: Modem can reach the Internet.
PUBLIC IPv4: 172.58.124.58
PUBLIC IPv6: 2607:fb90:8daf:c41c:cd5b:836d:f274:5caf
IG LOCAL IP: 192.168.225.1
IPPT MAC: b0:7b:25:80:48:cd
TTL VALUE: 65

FIRMWARE VERSION: RM520NGLAAR01A08M4G_01.200.01.200
IMEI: XXXXXXXXXXXX5561
FSN: XXXXXXXXXXXX
CARRIER PROFILE: T-Mobile - Phone/Tablet w/Wi-Fi Calling, MANUAL

CARRIER: T-Mobile
pSIM CCID: XXXXXXXXXXXXXXXX662F
PHONE NUMBER: XXXXXXX6889
APN: fast.t-mobile.com, IPV4V6

NETWORK MODE: LTE:NR5G, NSA Disabled
CONNECTED CELLS:
NR5G-SA - "NOCONN", "NR5G-SA", "TDD", 310,260,105FC412D,567,A6F700,520110,41,12,-89,-11,15,1,-

CURRENTLY ENABLED BANDS:
LTE - 1:2:3:4:5:7:8:12:13:14:17:18:19:20:25:26:28:29:30:32:34:38:39:40:41:42:43:46:48:66:71
5G SA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

MODEM TEMPERATURE: 51c
CURRENT TIME: Wed Jan 10 16:57:10 UTC 2024
UPTIME: 18:42 (HH:MM)

Press [Enter] key to continue...|
```

### Internet Status

Displays the level of current Internet connectivity. **Green** color indicates no issues, **Yellow** indicates possible issues with DNS resolution, and **Red** indicates no connectivity.

### Network Information

This section shows both the local and public IP addresses being used by the unit. It also shows the MAC address of the connected device which will receive the carrier IP address if the default IP Passthrough (IPPT) is enabled, and the TTL setting of outbound traffic if a value has been set.

### Firmware, Device IDs, and Carrier Profile

Current base revision of the modem firmware release along with its IMEI, FSN, and active carrier profile.

### Carrier & APN Info

Shows carrier related information for the currently inserted SIM card along with current APN settings.

## Network Mode & Connected Cells

Currently selected network RF technology of the modem, along with the 5G technology enabled if relevant (NSA = Non-Standalone, SA = Standalone). Also indicates the current primary carrier cell (PCC).

## Band Locks

Displays the currently selected list of bands enabled for modem attach. If 5G NSA or SA are disabled, the band list for these will show “DISABLED”, respectively.

## Modem Temperature, Current Time, & Uptime

Displays the current temperature in degrees centigrade of the modem as measured internally, the current time and date of the unit in UTC (synchronized from the connected cell carrier), and how long the IG unit has been up since the last rebooted or powered off.

## Live Signal

Selecting the optimal installation location for your InvisaGig unit is the key to achieving the best performance. The unit should be placed in a location and orientation where it will receive the best signal exposure from the carrier’s nearest cell site. The Live Signal function allows for near instant feedback of signal information while reorienting the unit and selecting its permanent installation location.

Under Live Signal view, the connected cell, associated signal information, and modem temperature is displayed in near real-time, refreshing all information once per second. For signal information values are shown which represent each internal antenna of the InvisaGig unit. Pressing [x] or [q] will end the live view and display the last measured value until you press [Enter] to return to the Main Menu.

Press [x] or [q] to exit live view.

## PRIMARY CARRIER CELL

"TDD NR5G", "310260", "NR5G BAND 41", 520110

## SIGNAL POWER

-90, -96, -86, -91, NR5G

## SIGNAL QUALITY

-10, -10, -3, -3, NR5G

## SIGNAL/NOISE RATIO

12, 12, 12, 12, NR5G

## CARRIER AGGREGATION CELLS

"PCC", 520110, 12, "NR5G BAND 41", 567

"SCC", 396970, 3, "NR5G BAND 25", 1, 264, 0, -, -

(PCC=PRIMARY, SCC=SECONDARY)

## MODEM TEMPERATURE

47c

### Primary Carrier Cell

This is the primary carrier channel that the modem is connected to.

### Signal Power

This shows the Reference Signal Received Power (RSRP) for all four connected antennas in dBm.

Reference ranges:

**Excellent = > -80**, **Good = -80 to -90**, **Marginal = -90 to -100**, **Weak = < -100**

### Signal Quality

This shows the Reference Signal Received Quality (RSRQ) for all four connected antennas in dB.

Reference ranges:

**Excellent = > -10**, **Good = -10 to -15**, **Okay = -15 to -20**, **Bad = < -20**

### Signal/Noise Ratio

This shows the Signal to Noise Ratio (SINR) for all four connected antennas in dB. Reference ranges:

**Excellent = > -20**, **Good = 13 to 20**, **Okay = 0 to 13**, **Bad = < 0**

### Carrier Aggregation Cells

This shows the Primary (PCC) and Secondary (SCC) cells being used for Carrier Aggregation (CA).

## Main Menu

This is the main menu which is displayed after Login on the Landing Menu.

- 1) Change Password
  - 2) Modem Info
  - 3) Live Signal
  - 4) Network Mode (LTE/LTE+5G/5G)
  - 5) Band Locks
  - 6) Local Tower Search & Lock
  - 7) Carrier Profile Selection & APN
  - 8) InvisaGig Update Check
  - 9) Factory Defaults
  - 10) Local IP & Multiple Modem Setup
  - 11) Text Messages
  - 12) WatchDog & Scheduled Restart
  - 13) DarkMode Toggle
  - 14) Reboot
- Please enter your choice: █

## Change Password

Selecting this option will allow you to change the password used to access the Main Menu. You will be prompted to first enter the existing password and, if correct, then for the new password twice to confirm it. Upon update of the password you will be dropped back to the Landing Menu where you would then need to enter the updated password to access the Main Menu again.

```
Enter the current password:
*****
Enter the new password:
*****
Enter the new password again:
*****
Password updated successfully.
Press [Enter] to return.█
```

## Modem Info

This is the same 'Modem Info' accessed via the Landing Menu. See 'Modem Info' description from the previous 'Landing Menu' section for details.

## Live Signal

This is the same Live Signal information which can be found in the Landing Menu. Refer to the 'Live Signal' description under the Landing Menu section of this document for more info.

## Network Mode (LTE/LTE+5G/5G)

The RF technology type used by the modem can be changed using this option. The selection options are: LTE Only, LTE & 5G, or 5G Only. When selecting LTE & 5G, an additional prompt is shown asking which 5G technology should be enabled (NSA = Non-Standalone, SA = Standalone).

```
!!!--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--!!!  
Network mode changes may disconnect you temporarily due to modem detach/re-attach activity.
```

```
Do you still wish to proceed (y/n) ? █
```

```
CURRENT NETWORK MODE: LTE:NR5G, NSA Disabled
```

- 1) LTE Only
- 2) LTE & 5G
- 3) 5G Only
- 4) Return to Main Menu

```
Choose a mode:
```

```
2█
```

- 1) Enable SA & NSA
- 2) Disable SA
- 3) Disable NSA
- 4) Return to Main Menu

```
Choose SA/NSA enablement:
```

```
█
```

```
Network mode set to LTE & 5G.
```

```
NR SA & NSA enabled.
```

```
Press [Enter] key to continue...█
```

## Band Locks

Band locking can be used to limit the bands used by the modem when connecting to tower cells. This can be useful to limit cell attachment on specific bands in situations where these bands are known to have issues such as instability or congestion. By default, all listed bands supported by the modem are enabled. To “lock” bands, one can shorten the list of available bands by removing undesirable ones from the list, leaving only the ones which are still desired. User input should be formatted as a colon (‘:’) separated list of band values (ex. 2:4:12:71 ... etc). The modem will then connect to the band(s) in the remaining list based on signal strength. If no input or invalid input is provided for the list of bands to lock, no changes will be made.

Be aware that if bands are removed from the list of available bands, they can no longer be used for either primary carrier channels (PCC) or secondary carrier channels (SCC) which means that they will not be included in any available carrier aggregation band combinations. Also, be aware that 5G NSA is still using LTE for its PCC so any bands removed from the LTE list will have a direct effect on 5G NSA connectivity. Finally, Band Locking should not be confused with Tower Locking which is the process of forcing the modem to only attach to a specific tower cell. Local Tower Search & Lock is covered in the next section.

- 1) LTE
  - 2) 5G NSA
  - 3) 5G SA
  - 4) Reset All to Defaults
  - 5) Return to Main Menu
- Choose which bands to lock, or perform a reset to defaults:



CURRENTLY ENABLED BANDS:

LTE - 1:2:3:4:5:7:8:12:13:14:17:18:19:20:25:26:28:29:30:32:34:38:39:40:41:42:43:46:48:66:71  
5G SA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

- 1) LTE
  - 2) 5G NSA
  - 3) 5G SA
  - 4) Reset All to Defaults
  - 5) Return to Main Menu
- Choose which type of bands to lock, or perform a reset to defaults:

SA 5G locked to: 1:2:3:5:7:8:12:13:14:18:20:26:28:29:30:38:40:41:48:66:70:75:76:77:78:79.  
Press [Enter] key to continue...

## Local Tower Search & Lock

Tower locking, a.k.a. Cell locking, allows the modem to be locked to a specific LTE or 5G NR cell (or list of cells under LTE Only network mode). **Tower locking is not recommended in most cases due to the connectivity issues it may introduce if the locked cell goes offline due to malfunction, maintenance, etc.** This is because, when the modem is instructed to lock to a specific cell, it will, by default, not “fall back” to other cells automatically if the locked one loses connectivity. However, InvisaGig has added unique failsafe functionality (Connection WatchDog) enabled by default when locking cells to ensure cell locks are removed if the modem loses connectivity.

Cell locking is really only beneficial when the unit is located an equal distance between two carrier cell sites which broadcast the same bands with roughly the same signal strength but have different amounts of congestion. If the user wishes to ensure the modem does not connect to the congested site, then a cell lock can be put in place to keep it from roaming between the two sites. Outside of this scenario, it is recommended to either allow default modem logic to select the cell, or if the undesired cell site is broadcasting on different bands, use Band Locking to mitigate the issue instead.

## Simple Tower Locking

To search for a local tower cell and lock it, simply select the menu option for ‘Local Tower Search & Lock’ and choose the cell type you wish to lock. Your Network Mode must match the tower type you select. If you select a scan for a tower type which does not match your current Network Mode, you will be asked if you want to change the network mode to proceed with the selected tower type. Once the Network Mode is set compatibly, you can return to ‘Local Tower Search & Lock’ and proceed:

!!!-WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--!!!  
Tower scanning & locking may disconnect you from the Internet in order to scan, lock, or unlock towers.  
You may lock up to 20 LTE tower cells at a time. 5G SA tower cells can be locked only one at a time.  
If any towers are already locked, they will be replaced with your updated selections.  
With a carrier SIM is inserted, 2-3 scans are recommended to ensure all available tower cells are shown.  
For best scan results across carriers (without locking intent), it is recommended to scan w/ SIM removed.

Tower cells may not be highly available and could lose connectivity in case of maintenance or other outage.  
When a tower cell is locked, the WatchDog service will be enabled to check connectivity every 5 minutes.  
This provides a failsafe which will remove tower cell locks in the event a tower cell becomes unavailable.  
The check interval of the WatchDog service can be adjusted or disabled under its named Main Menu option.

Do you still wish to proceed (y/n) ? y

- 1) LTE
- 2) 5G SA
- 3) Remove All Tower Locks
- 4) View Tower Lock Log
- 5) Return to Main Menu

Choose the tower type to scan/lock, or remove existing locks: 2

For 5G SA scans and locking, Network Mode must include NR5G w/ only 5G SA enabled.  
Required changes will be made automatically if you continue though a disconnect may occur.  
Proceed? (y/n): y

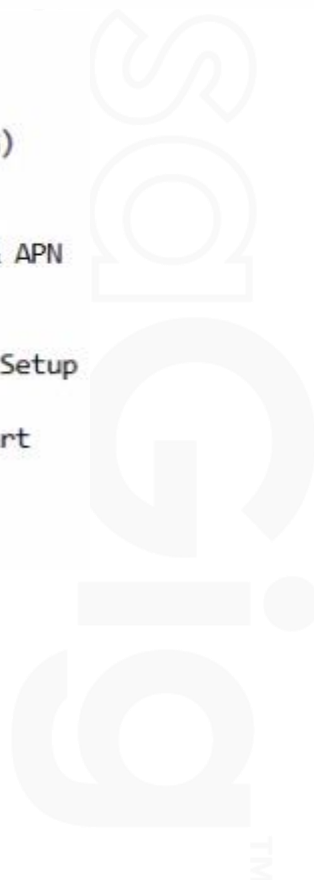
Network mode set to LTE & 5G.

NR NSA disabled.

You may now return to Local Tower Search & Lock to proceed with an 5G SA scan and/or lock.  
Press [Enter] key to return...

- 1) Change Password
- 2) Modem Info
- 3) Live Signal
- 4) Network Mode (LTE/LTE+5G/5G)
- 5) Band Locks
- 6) Local Tower Search & Lock
- 7) Carrier Profile Selection & APN
- 8) InvisaGig Update Check
- 9) Factory Defaults
- 10) Local IP & Multiple Modem Setup
- 11) Text Messages
- 12) WatchDog & Scheduled Restart
- 13) DarkMode Toggle
- 14) Reboot

Please enter your choice: 6



- 1) LTE
- 2) 5G SA
- 3) Remove All Tower Locks
- 4) View Tower Lock Log
- 5) Return to Main Menu

Choose the tower type to scan/lock, or remove existing locks: 2

Press [Enter] to begin a tower scan.

Alternatively, manually specify the cell as -  
[PCI],[NR-EARFCN],[SCS],[BAND]:

5G NR tower scan started. Please wait, this may take some time...

Scan completed. Results:

- 1) Band: 77, Carrier: Verizon, Strength: -89, Quality: -11, Tower ID: Unknown
- 2) Band: 77, Carrier: Verizon, Strength: -89, Quality: -11, Tower ID: Unknown
- 3) Band: 71, Carrier: T-Mobile, Strength: -71, Quality: -11, Tower ID: 1073092
- 4) Band: 41, Carrier: T-Mobile, Strength: -89, Quality: -11, Tower ID: 1073092
- 5) Band: 25, Carrier: T-Mobile, Strength: -95, Quality: -13, Tower ID: 1073092
- 6) Band: 71, Carrier: Dish Network, Strength: -76, Quality: -11, Tower ID: 151014
- 7) Band: 70, Carrier: Dish Network, Strength: -89, Quality: -11, Tower ID: 151014

Select tower cell from the list to lock.

(Enter '0' to rescan or press [Enter] to return without locking): 4

Cell will now be locked when you press [Enter].

This will disrupt your connection temporarily.

Press [Enter] key to continue...

## Advanced Tower Locking

To manually lock an LTE tower (or for 5G NSA since the primary carrier is still LTE), you will require its EARFCN ('E-UTRA Absolute Radio Frequency Channel Number') and PCI ('Physical Cell ID') identifiers. To lock a 5G SA tower, you will need its PCI, NR-EARFCN ('New Radio – EARFCN'), SCS ('Subcarrier Spacing')\*, and BAND (New Radio Band #). These required values can be obtained in several ways.

If you have already locked a cell using Simple Tower Locking, the required parameters to lock a tower will be listed under Modem Info or Local Tower Search & Lock menu options. Otherwise, you can find them via a community repository source such as CellMapper or spectrum scanning tools (such as an iPhone in Field Test Mode, an Android app like LTE Discovery, or other dedicated spectrum analyzer hardware). As stated previously under Simple Tower Locking, your Network Mode must be compatible with the tower type you wish to lock else you be prompted to change it.

**\*NOTE:** SCS, or 'Subcarrier Spacing', is a new parameter used for 5G NR; it is measured in bandwidth values of 15, 30, 60, 120, 240, or 480 KHz. When referring to Cell Scan output to obtain a cell's SCS, be aware that it is reported as a single digit value ranging between '1' (30KHz) and '5' (480KHz) which corresponds to the bandwidth. The Tower Lock function will accept either the actual KHz value or its equivalent, single-digit, representative value (that Cell Scan output provides). If the single digit format is used, the Cell Lock function will automatically convert it to the corresponding KHz value in the background. The converted, actual KHz value will then be reported in the Tower Lock logs and Modem Info outputs.



INTERNET STATUS: Modem can reach the Internet.

PUBLIC IPv4: 172.58.121.238  
PUBLIC IPv6: 2607:fb91:108c:8550:7d29:68d0:52cf:a20  
IG LOCAL IP: 192.168.225.1  
IPPT MAC: b0:7b:25:80:48:cd  
TTL VALUE: 65

FIRMWARE VERSION: RM520NGLAAR01A08M4G\_01.200.01.200  
IMEI: XXXXXXXXXXXX5561  
FSN: XXXXXXXXXXXX  
CARRIER PROFILE: T-Mobile - Phone/Tablet w/Wi-Fi Calling, MANUAL

CARRIER: T-Mobile  
pSIM CCID: XXXXXXXXXXXXXXXX662F  
PHONE NUMBER: XXXXXXX6889  
APN: fast.t-mobile.com, IPV4V6

NETWORK MODE: LTE:NR5G, NSA Disabled  
CONNECTED CELLS:  
NR5G-SA - "NOCONN", "NR5G-SA", "TDD", 310,260,105FC412D,567,A6F700,520110,41,12,-96,-12,15,1,-

LOCKED 5G SA CELL:  
<PCI>,<NR-EARFCN>,<SCS>,<BAND>  
567,520110,30,41  
LOCK STATUS: ACTIVE

CURRENTLY ENABLED BANDS:  
LTE - 1:2:3:4:5:7:8:12:13:14:17:18:19:20:25:26:28:29:30:32:34:38:39:40:41:42:43:46:48:66:71  
5G SA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

WATCHDOG INTERVAL: Every 5 minutes.

MODEM TEMPERATURE: 53c  
CURRENT TIME: Fri Jan 12 18:12:39 UTC 2024  
UPTIME: 2 days 19:57 (HH:MM)

Press [Enter] key to continue...|

LOCKED 5G SA CELL:  
<PCI>,<NR-EARFCN>,<SCS>,<BAND>  
567,520110,30,41  
LOCK STATUS: ACTIVE

- 1) LTE
- 2) 5G SA
- 3) Remove All Tower Locks
- 4) View Tower Lock Log
- 5) Return to Main Menu

Choose the tower type to scan/lock, or remove existing locks: |

Are you sure you wish to remove the current tower lock(s)? (y/n):

y

Any existing tower locks will be removed when you press [Enter].

This will disrupt your connection temporarily.

Press [Enter] key to continue...

- 1) LTE & 5G NSA
- 2) 5G SA
- 3) Remove All Tower Locks
- 4) View Tower Lock Log
- 5) Return to Main Menu

Choose which tower type to lock, or remove existing locks:

Press [Enter] to begin a tower scan.

Alternatively, manually specify the cell as -

[PCI],[NR-EARFCN],[SCS],[BAND]: 567,520110,30,41

Cell will now be locked when you press [Enter].

This will disrupt your connection temporarily.

Press [Enter] key to continue...

## Tower Lock Log

To view a log of the Tower Lock activities, select the View Tower Lock Log option from the Local Tower Search & Lock menu. The following example log shows the Tower Lock actions taken directly after a reboot to set a lock which the user had previously selected.

LOCKED 5G SA CELL:

<PCI>,<NR-EARFCN>,<SCS>,<BAND>

567,520110,30,41

LOCK STATUS: ACTIVE

- 1) LTE
- 2) 5G SA
- 3) Remove All Tower Locks
- 4) View Tower Lock Log
- 5) Return to Main Menu

Choose the tower type to scan/lock, or remove existing locks: 4

This log shows the most recent tower lock activity:

```
-----START LOG-----
Fri Jan 12 18:25:08 UTC 2024 - Waiting for the initial attach to complete...
Fri Jan 12 18:25:09 UTC 2024 - Initial attach success.
Fri Jan 12 18:25:09 UTC 2024 - Checking for locked cell(s)...
Fri Jan 12 18:25:09 UTC 2024 - No cells are currently locked.
Fri Jan 12 18:25:09 UTC 2024 - Cell lock has been specified.
Fri Jan 12 18:25:09 UTC 2024 - Locking 5G SA cell '567,520110,30,41'...
Fri Jan 12 18:25:09 UTC 2024 - Stopping connection monitoring services prior to carrier detach.
Fri Jan 12 18:25:10 UTC 2024 - Detaching from carrier to prepare for cell changes...
Fri Jan 12 18:25:11 UTC 2024 - Success.
Fri Jan 12 18:25:11 UTC 2024 - Cleaning up any remaining interfaces.
Fri Jan 12 18:25:12 UTC 2024 - Lock command success.
Fri Jan 12 18:25:12 UTC 2024 - Enabling WatchDog to run every 300 seconds.
Fri Jan 12 18:25:12 UTC 2024 - Reattaching to carrier...
-----END LOG-----
CURRENT IG TIME: Fri Jan 12 18:31:33 UTC 2024
Press [Enter] key to continue...|
```

## Additional Notes and Recommendations

Simple Tower Locking scans with a carrier SIM already inserted will yield results reflecting mostly the carrier's own cells and/or roaming partner cells. Cell scanning without a SIM inserted may yield additional cells for other available carriers, but you would need to insert the appropriate carrier provisioned SIM to be able to attach to them.

5G NR Tower Search is still under active improvement by modem vendors. We recommend performing at least two to three consecutive scans to ensure all available tower cells are listed. It has been observed that sometimes, in at least the first 5G NR scan performed, the actively connected cell details may not be included in the result; thus, the recommendation is to scan multiple times to ensure completeness of the cell information.

## Carrier Profile Selection & APN

Modern cellular modems employ carrier optimized profiles which are used for connection to a specific carrier. These profiles also take care of selecting the appropriate APN. By default, the modem will automatically choose the preferred profile using Auto selection based on the physical SIM. In some cases, a carrier profile may contain tunings on which towers or bands it will allow the modem to connect to.

In many cases it may be desirable to select a specific profile manually instead of using Auto selection. The Carrier Profile & APN menu item allows you to do this. As the InvisaGig platform has mostly been tested with cellular carriers in the United States, currently the list of manual presets reflects US carriers. Additionally, specific APNs can be set using the Generic w/ Manual APN option. When changing carrier profiles, rebooting is needed for the changes to take effect. Any required reboots will happen automatically once a selection is made.

CURRENT MODE: AUTO

- 1) Allow Modem to Auto Select Carrier Profile
- 2) Manually Select Carrier Profile
- 3) Return to Main Menu

Choose a mode: 2

!!!--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--!!!

Proceeding will enable your selected profile and perform an immediate reboot.  
If Auto Select is currently enabled, two successive reboots will be performed.  
The configuration page will be unavailable for the duration of the reboot(s).

Do you want to proceed (y/n)? y

- 1) Generic w/ Manual APN
- 2) T-Mobile - Hotspot
- 3) T-Mobile - Phone/Tablet w/Wi-Fi Calling
- 4) T-Mobile - Home Internet w/Wi-Fi Calling
- 5) T-Mobile - Business Internet w/Static IP
- 6) MetroPCS
- 7) Verizon - Phone/Tablet
- 8) Verizon - Home Internet
- 9) Visible
- 10) Tracfone / Straight Talk
- 11) MobileX
- 12) AT&T - LTE Hotspot/Tablet
- 13) AT&T - LTE Phone
- 14) AT&T - FirstNet
- 15) AT&T - 5G Hotspot/Tablet
- 16) AT&T - 5G Phone
- 17) Cricket
- 18) Return to Main Menu

Choose a carrier profile:

3

Set T-Mobile Phone/Tablet w/Wi-Fi Calling profile w/ 'fast.t-mobile.com' APN.  
Now rebooting...

INTERNET STATUS: Modem can reach the Internet.

PUBLIC IPv4: 172.58.124.66

PUBLIC IPv6: 2607:fb91:1763:81e:a47a:bc58:ce56:955

IG LOCAL IP: 192.168.225.1

IPPT MAC: b0:7b:25:80:48:cd

TTL VALUE: 65

FIRMWARE VERSION: RM520NGLAAR01A08M4G\_01.200.01.200

IMEI: XXXXXXXXXXXX5561

FSN: XXXXXXXXXXXX

CARRIER PROFILE: T-Mobile - Phone/Tablet w/Wi-Fi Calling, MANUAL

CARRIER: T-Mobile

pSIM CCID: XXXXXXXXXXXXXXXX662F

PHONE NUMBER: XXXXXXX6889

APN: fast.t-mobile.com, IPV4V6

NETWORK MODE: LTE:NR5G, NSA Disabled

CONNECTED CELLS:

NR5G-SA - "NOCONN", "NR5G-SA", "TDD", 310,260,105FC412D,567,A6F700,520110,41,12,-93,-12,15,1,-

CURRENTLY ENABLED BANDS:

LTE - 1:2:3:4:5:7:8:12:13:14:17:18:19:20:25:26:28:29:30:32:34:38:39:40:41:42:43:46:48:66:71

5G SA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

WATCHDOG INTERVAL: Every 5 minutes.

MODEM TEMPERATURE: 55c

CURRENT TIME: Fri Jan 12 18:58:41 UTC 2024

UPTIME: 4 min

Press [Enter] key to continue...

## [InvisaGig Update Check](#)

Periodically, feature enhancements and bug fixes will be published as updates to the InvisaGig configuration interface. To check for and install updates, use this option.

Do you wish to check for updates (y/n)? y

INFO: Initializing update process.

INFO: Checking for available update...

INFO: New version 1.0.6 found, do you want to update? (y/n)?

## [Factory Defaults](#)

In case you would like to start fresh, you can reset all configuration values back to factory defaults by selecting this option.

**NOTE:** It is a good practice to remove the SIM card prior to executing a factory reset of the unit and to

leave it alone for a few minutes after the factory reset is performed before re-inserting a SIM and accessing the configuration page again. Following this best practice recommendation ensures that there is no network activity which could interrupt the defaults from being restored.

```
!!!--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--!!!  
This will reset all settings on the unit and issue an immediate reboot.  
Do *NOT* remove power while reset is in progress!
```

```
Do you still wish to proceed (y/n) ? y
```

```
ARE YOU ABSOLUTELY CERTAIN YOU WISH TO RESET ALL SETTINGS AND REBOOT? (y/n) ? y
```

```
Unit will now reboot and you will lose your connection due to network reconfiguration.  
After reboot, the config page can be accessed at 'https://192.168.225.1'.  
█
```

## Local IP & Multiple Modem Setup

Allows selection of the installation scenario. The unit may operate as a single device or as a member of a larger set of devices configured together in a failover or load-balanced scenario using appropriate third-party equipment. Preconfigured IP options are offered, or you can specify a private IP address of your choosing. The IP Passthrough (IPPT) MAC address can also be specified if desired. Any changes made under this menu item will result in an automatic reboot of the unit as a final step due to the required IP changes.

```
!!!--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--WARNING--!!!  
Proceeding will result in an automatic reboot of the device once all selections have been made.
```

```
Do you still wish to proceed (y/n) ? █
```

```
Select your scenario:
```

- 1) Single Unit
  - 2) Multi Unit
  - 3) Return to Main Menu
- ```
2█
```

```
Do you wish to change the default IP Passthrough (IPPT) behavior (y/n)?
```

```
(Choose 'N' to enable IPPT for the currently connected device MAC address; this is the default)  
(Choose 'Y' to specify the IPPT MAC; subsequent blank or invalid MAC input disables IPPT): n█
```

Which number unit should this unit be configured as?

- 1) 1st Unit
- 2) 2nd Unit
- 3) 3rd Unit
- 4) 4th Unit
- 5) 5th Unit
- 6) 6th Unit
- 7) Set my own IP
- 8) Return to Main Menu

7

Enter a \*valid\* private IPV4 address for this IG unit, or [ENTER] to return to the Main Menu:  
(ex. '10.0.0.1', '172.16.0.1', or '192.168.0.1')

192.168.155.1

Configuring as a member of a multi unit installation...

The unit will now reboot in order to complete network reconfiguration.

After the unit has restarted, the config page can be accessed at 'https://192.168.155.1'.

**NOTE:** When setting your own IP address, please make note of it, as this will now be the address on which you will access the configuration interface.

## Text Messages

Depending on the plan provisioned, the unit may receive text messages. This menu option can be used to view the text messages or delete them.

- 1) Check Messages
- 2) Delete Messages
- 3) Return to Main Menu

Choose a mode:

2

Phone Number: \_\_\_\_\_, Date: 07/20/23, Time: 16:03:58 UTC-7

Just testing!

Press [Enter] key to continue...

Are you sure you wish to delete \*ALL\* stored text messages (y/n) ? y

Messages deleted.

Press [Enter] key to continue...

## WatchDog & Scheduled Reboot

This menu option provides control of functionality that can automatically monitor for, and react to, a loss in Internet connectivity and the ability to schedule regular restarts of the unit if so desired.

### Connection WatchDog

When enabled, the Connection WatchDog will check Internet connectivity of the device at the user specified interval. If connection is lost, WatchDog will check for any active tower lock and remove it first to see if that restores the connection. If connection is still not restored or there is no active tower lock,

the unit will reboot to attempt to restore the connection. The preset intervals the user can select for the connection check to run at are 5, 15, and 30 minutes.

- 1) Connection WatchDog
- 2) Scheduled Restart
- 3) Return to Main Menu

Please enter your choice: 1

How often should WatchDog check for an active Internet connection?

- 1) Every 5 Minutes
- 2) Every 15 Minutes
- 3) Every 30 Minutes
- 4) Return to Main Menu

Please enter your choice: 1

WatchDog will check for a connection every 5 minutes.

If no connection to the Internet can be established during this check, the IG will automatically be restarted. Press [Enter] key to continue...

INTERNET STATUS: Modem can reach the Internet.

PUBLIC IPv4: 172.58.120.98

PUBLIC IPv6: 2607:fb91:1004:c0c3:908e:4186:95fb:b340

IG LOCAL IP: 192.168.155.1

IPPT MAC: b0:7b:25:80:48:cd

TTL VALUE: 65

FIRMWARE VERSION: RM520NGLAAR01A08M4G\_01.200.01.200

IMEI: XXXXXXXXXXXX5561

FSN: XXXXXXXXXXXX

CARRIER PROFILE: T-Mobile - Phone/Tablet w/Wi-Fi Calling, MANUAL

CARRIER: T-Mobile

pSIM CCID: XXXXXXXXXXXXXXXX662F

PHONE NUMBER: XXXXXXX6889

APN: fast.t-mobile.com, IPV4V6

NETWORK MODE: LTE:NR5G, NSA and SA Enabled

CONNECTED CELLS:

NR5G-SA - "NOCONN", "NR5G-SA", "TDD", 310,260,105FC412D,567,A6F700,520110,41,12,-87,-11,14,1,-

CURRENTLY ENABLED BANDS:

LTE - 1:2:3:4:5:7:8:12:13:14:17:18:19:20:25:26:28:29:30:32:34:38:39:40:41:42:43:46:48:66:71

5G NSA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

5G SA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

WATCHDOG INTERVAL: Every 5 minutes.

MODEM TEMPERATURE: 54c

CURRENT TIME: Sun Jan 14 21:53:40 UTC 2024

UPTIME: 6 min

Press [Enter] key to continue...



## Scheduled Restart

This feature allows the user to schedule hourly, daily, or weekly restarts of the IG device. The time zone is localized to the IG's UTC time (established by NTP once the modem is connected to the carrier).

- 1) Connection WatchDog
- 2) Scheduled Restart
- 3) Return to Main Menu

Please enter your choice: 2

Select the desired reboot interval:

- 1) Hourly
- 2) Daily
- 3) Weekly
- 4) Return to Main Menu

Please enter your choice: 2

Current IG time: 22:03 UTC.

Specify the next desired reboot time in UTC, 24-hour format (HH:MM): 02:00

Reboot scheduled successfully for Daily @ 02:00 UTC.

Press [Enter] key to continue...

INTERNET STATUS: Modem can reach the Internet.

PUBLIC IPv4: 172.58.120.98

PUBLIC IPv6: 2607:fb91:1004:c0c3:908e:4186:95fb:b340

IG LOCAL IP: 192.168.155.1

IPPT MAC: b0:7b:25:80:48:cd

TTL VALUE: 65

FIRMWARE VERSION: RMs20NGLAAR01A08M4G\_01.200.01.200

IMEI: XXXXXXXXXXXX5561

FSN: XXXXXXXXXXXX

CARRIER PROFILE: T-Mobile - Phone/Tablet w/Wi-Fi Calling, MANUAL

CARRIER: T-Mobile

pSIM CCID: XXXXXXXXXXXXXXXX662F

PHONE NUMBER: XXXXXX6889

APN: fast.t-mobile.com, IPV4V6

NETWORK MODE: LTE:NR5G, NSA and SA Enabled

CONNECTED CELLS:

NR5G-SA - "NOCONN", "NR5G-SA", "TDD", 310,260,105FC412D,567,A6F700,520110,41,12,-87,-12,23,1,-

CURRENTLY ENABLED BANDS:

LTE - 1:2:3:4:5:7:8:12:13:14:17:18:19:20:25:26:28:29:30:32:34:38:39:40:41:42:43:46:48:66:71

5G NSA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

5G SA - 1:2:3:5:7:8:12:13:14:18:20:25:26:28:29:30:38:40:41:48:66:70:71:75:76:77:78:79

RESTART SCHEDULE: Daily @ 02:00 UTC.

CURRENT IG TIME: Sun Jan 14 22:04:19 UTC 2024

WATCHDOG INTERVAL: Every 5 minutes.

MODEM TEMPERATURE: 54c

CURRENT TIME: Sun Jan 14 22:04:19 UTC 2024

UPTIME: 16 min

Press [Enter] key to continue...

## Dark Mode Toggle

This function allows the user to enable or disable an alternative UI color scheme. Activating Dark Mode inverts coloration of the background and foreground elements resulting in a black background and white foreground text. This can be helpful for those with light sensitivities. Deactivating Dark Mode returns the UI to the default of black text on a white background.

```
InvisaGig Configuration v1.0.10 - (c) 2023 InvisaGig
1) Login
2) Modem Info
3) Live Signal
Please enter your choice: █
```

## Reboot

Selecting this option will allow you to perform a restart of the unit.

```
A reboot will disconnect you from the Internet.
Do you wish to proceed (y/n) ? █
```

