

HOW TO GET THE MOST OUT OF YOUR CEL-FI GO

Your new G31 Cel-Fi GO has the capability of boosting one of the following technologies on the Telstra network:

3G (WCDMA) at 850MHz (Also referred to as band 5 or B5)

4G (LTE) at 1800MHz (Also referred to as band 3 or B3)

4G (LTE) at 700MHz (Also referred to as band 28 or B28)

3G is generally used for voice calls while 4G will provide data service as well as HD (VoLTE) calls on handset that support this, the link below has more information on how to check if your handset supports this and also how to set it up.



BACKGROUND INFORMATION

The Telstra network utilises a few different frequency bands across the 3G/4G technologies. They are:

- **3G** – 850Mhz – Band 5 (and 2100MHz band 1 in some metro areas) - this is predominantly used for voice/data calls on legacy handsets/devices.
- **4G** – 1800MHz – Band 3, 700MHz Band 28 and 2600MHz band 7, this is used for Data services as well as HD voice calls. (Note The Cel-Fi GO only supports B3/5/28)

Telstra, like all other mobile network operators, implement various strategies in order to provide the best services to their customers while utilising their assets in the most efficient way. As such your mobile phone might not always select the frequency band with the highest signal level as it will usually prefer the 4G service over 3G and generally high frequencies over lower ones. ie if you are in an area where the signal strength on the 2600MHz band 7 is lower than the 1800Mhz band 3 the network may dictate that your handset use the B7 provided that the signal strength quality is good enough.

The Cel-Fi GO is connected to an outdoor antenna which means it will receive a better signal due to its location and the antenna gain compared to a mobile phones internal antenna. The Cel-Fi GO then uses a parameter set as set out in appendix A to calculate which technology to boost. That means that the Cel-Fi go might not boost the same signal as the one which the customers Mobile phone is serving from and the perception might be that there is no service improvement. It is also worth noting that the Cel-Fi GO might not boost the signal at all if it is in an area where the signal is sufficient.

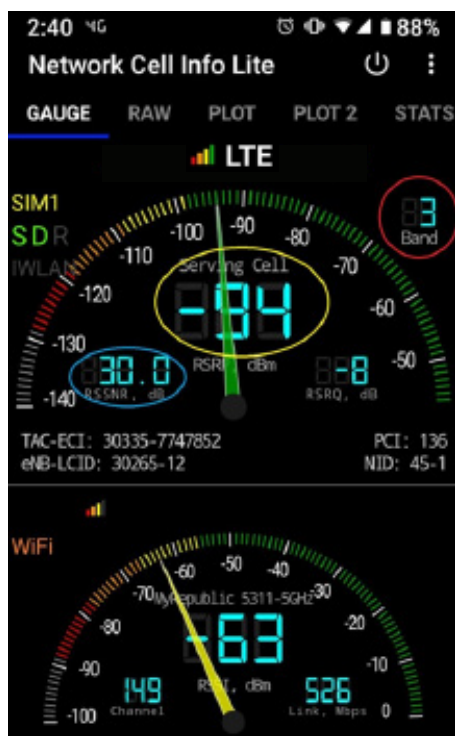
You will need to check what service the Cel-Fi is boosting versus what service your handset is connected to, the following document will help you to review this in order to optimise your installation for the best service.





TECHNICAL GUIDE

When you are setting up your new Cel-Fi GO it is important to understand what service you want to boost. It is always a good idea to check the service that you are currently using. There are various apps available for most smartphones. In this example, "Network Cell Info Lite" has been used. A sample screenshot can be seen below:



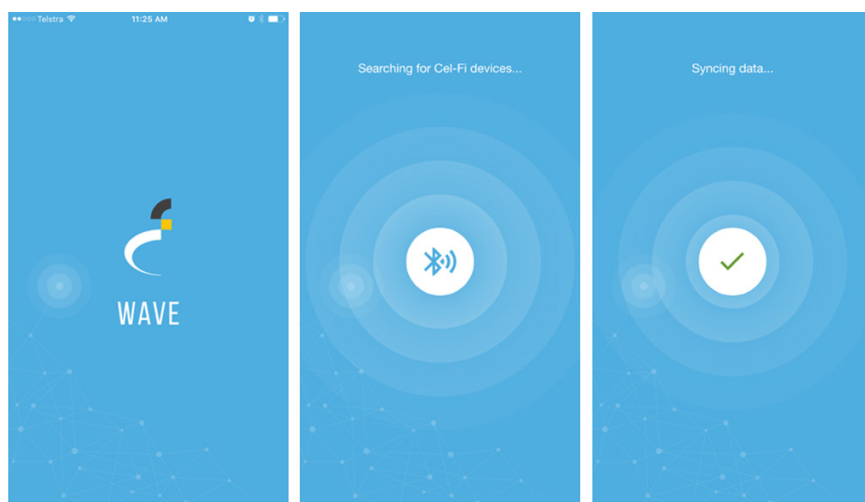
The Screen to the left shows a few key bits of information:

LTE – i.e. 4G, for 3G services it will show one of but not limited to 3G, 3.5G, WCDMA, HSPA, HSDPA, HSDPA+.

Red Circle – this shows the current band that the phone is connected to, in this case B3 (band 3 1800MHz 4G service)

Yellow Circle – Relative signal strength in dB, note this is a negative value and it can go as low as -120dB which is the lower limit for data services. Note that good service can be maintained at lower signal levels due to the resilience of the technology. For 3G service this lower limit is -110dB.

Blue Circle – Signal to interference indicator. The lower this number the lower the quality of the signal. Anything above 5 is fair and above 10 is good. When the quality goes below 5 the service will start to degrade. Note that for 3G this app does not show the interference level.



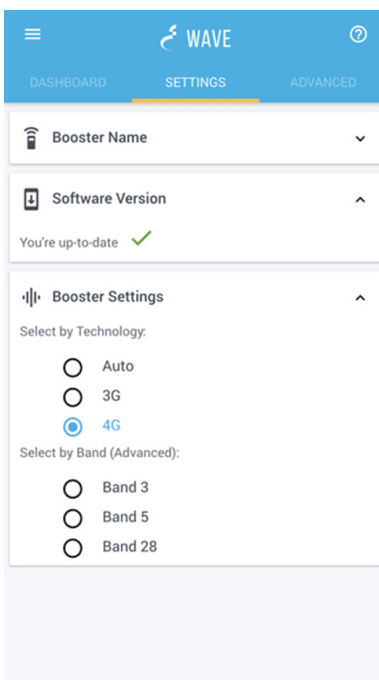
You have now determined from the above as to what technology and band your phone is using in this area. This information can now be used to setup your Cel-Fi GO.

- Connect to the Cel-Fi GO via the wave app, you will see a transition between the screens below.



Complete the registration process if you have done this previously and you should arrive at the dashboard screen that displays several things:

- **Errors** – an explanation of any issues with the setup or hardware
- **Signal Strength** - from the network
- **Boost** - represented by 1 to 9, with 9 being the most boost. Isolating the indoor antenna from the outdoor antenna will assist in increasing this number and therefore the coverage area. On the GO this feature is a direct coloration of the “Downlink System Gain”
- **Operator** - current operator being boosted
- **Coverage** - If the unit is boosting 3G (3G/4G will be displayed),if boosting 4G (LTE will be displayed)



Click on the settings tab. It offers the ability to control what frequencies Cel-Fi will boost. This is handy for optimising the unit for voice or Internet, to maximise the Internet speed or select a band that is compatible with all phones in a vehicle or room.

- **Booster Name** – you can assign a name to your Cel-Fi. Handy when you have multiple systems.
- **Software Version** - let's you know if you have the latest version
- **Booster Settings** - control which technology is boosted (3G/4G/Auto) or which frequency (Band 3 = 1800/Band 5 = 850/Band 28 = 700) – Use the information you obtained with the Network Cell Info app to set the Go onto the appropriate band to ensure optimal performance.



WAVE | DASHBOARD | SETTINGS | **ADVANCED** | Send Log

OVERVIEW

Network Strength

WCDMA 884.8 MHz

SUPER CHANNELS

Radio A Band 5 : WCDMA (Boosting)

Description	Value
Bandwidth	10 MHz
Downlink centre freq.	884.8 MHz
Uplink centre freq.	839.8 MHz
PRN Cell ID	265
Donor RSSI	-61 dBm
Donor RSCP	-67 dBm
Donor EC/IO	-5 dB
Downlink TX power	13 dBm
Uplink TX power	-58 dBm
Ext. antenna in use	Yes
Uplink Safe Mode Gain	72 dB
Downlink System Gain	73 dB
Uplink System Gain	0 dB
Downlink Echo Gain	9 dB
Uplink Echo Gain	-50 dB

Radio B : Unused

Radio C : Unused

Radio D : Unused

DEVICE VERSION

Software Versions

CELL DETAILS

Radio A Band 5 : WCDMA

ID	Downlink Freq.	RSCP	ECIO
265	882.4 MHz	-71 dBm	-10 dB
289	882.4 MHz	-75 dBm	-14 dB
273	882.4 MHz	-83 dBm	-19 dB
41	882.4 MHz	-82 dBm	-21 dB
265	887.2 MHz	-80 dBm	-16 dB

Radio B : Unused

Radio C : Unused

Radio D : Unused



WAVE | DASHBOARD | SETTINGS | **ADVANCED** | Send Log

OVERVIEW

Network Strength

LTE 1815 MHz

SUPER CHANNELS

Radio A Band 3 : LTE (Boosting)

Description	Value
Bandwidth	20 MHz
Downlink centre freq.	1815 MHz
Uplink centre freq.	1720 MHz
PRN Cell ID	3
Donor RSSI	-65 dBm
Donor RSRP	-92 dBm
Donor RSRQ	-11 dB
Donor SINR	4 dB
Downlink TX power	-2 dBm
Uplink TX power	-96 dBm
Ext. antenna in use	Yes
Uplink Safe Mode Gain	81 dB
Downlink System Gain	74 dB
Uplink System Gain	0 dB
Downlink Echo Gain	2 dB
Uplink Echo Gain	-50 dB

Radio B : Unused

Radio C : Unused

Radio D : Unused

DEVICE VERSION

Software Versions

CELL DETAILS

Radio A Band 3 : LTE

ID	Downlink Freq.	RSRP	RSRQ
3	1815 MHz	-92 dBm	-10 dB

Radio B : Unused

Radio C : Unused

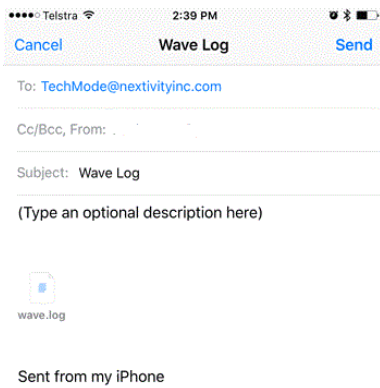
Radio D : Unused

If you see yourself as a bit of a tech boffin you can use the advanced tab to verify the information that you obtained via the phone app and compare it to what the Cel-Fi GO is reporting.

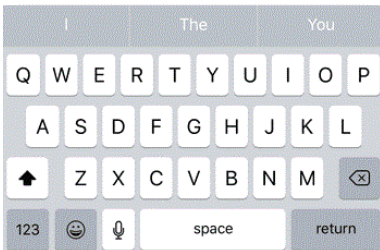
Useful information that can be accessed include:

- **Donor RSSI** - exact measurement of incoming mobile signal
- **Donor RSCP** - relative incoming mobile signal level
- **Downlink Center Frequency** - what frequency band is being boosted
- **Downlink System Gain** - the output power and the output power which relates to the increased coverage provided

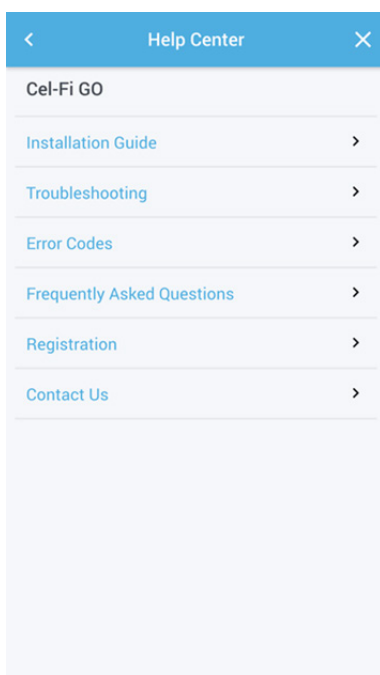
REQUEST ASSISTANCE - WAVE LOG



To assist with solving complex technical support issues a send log function is available. This will send a copy of the working log to Nextivity technical support. You can change the email address to nextivitysupport@rfi.com.au for local support.

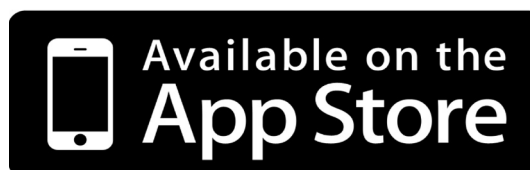


HELP CENTRE



The WAVE App features a help section to assist with common problems that you may come across.

The WAVE App is a very valuable tool in setting up Cel-Fi and optimising. It is a must have when using a GO, as it enables you to control the 3G/4G/Auto button on the front of the GO when it is mounted under a car seat.



APPENDIX A - CEL-FI GO BOOST TABLE

It needs to be noted that the Cel-Fi GO will not boost a signal when it is either too low to be boosted at a good quality service or in areas where the signal is strong enough for the mobile phone to be used without boost. The table below indicates how the Cel-Fi boost algorithm operates.

C E L - F I . S M A R T S I G N A L B O O S T E R

SIGNAL LEVEL RESTRICTIONS

UMTS Signal Level RSCP	GO Fixed	GO Mobile
Less Than -104 dBm	No Boost	No Boost
Between -104 and -80 dBm	Boost	Boost
More than - 80 dBm	Boost	No Boost

LTE Signal Level RSRP	GO Fixed	GO Mobile
Less Than -120 dBm	No Boost	No Boost
Between -120 and -95 dBm	Boost	Boost
More than -95 dBm	Boost	No Boost