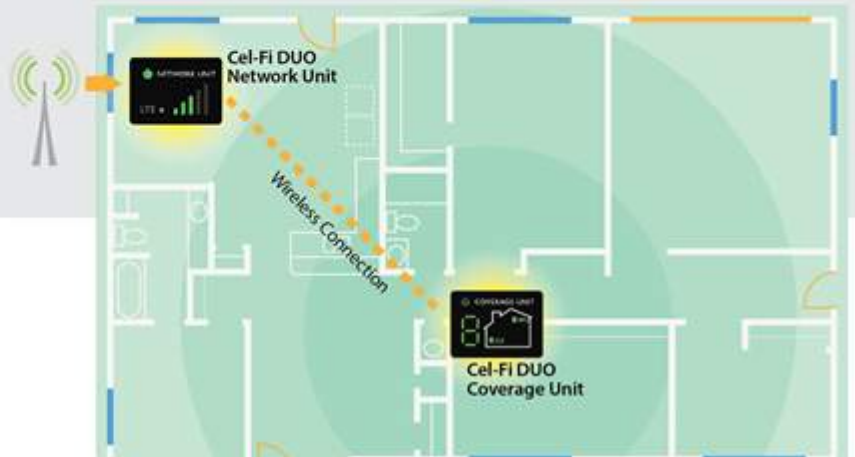# CEL-FI® DUO+

Improve voice (VoLTE) and data coverage for 4G LTE

Cel-Fi DUO+ is designed to dramatically improve voice and data indoor coverage in up to three (3) bands for 4G LTE.

System Features

- Plug and play, simple installation – no external cables, antennas, wires, or drills needed.
- Clean and compact industrial design.
- Intuitive LED User Interface (UI).
- System senses three (3) bands and relays any two.
- Integrated antennas.
- Auto-configured & Self-Contained
- Unlocked: Cell phones do not need to be registered with Cel-Fi to benefit.
- Peaceful coexistence with adjacent Cel-Fi systems.
- Patented 2-unit, 3-hop system.
- Remote software update capability.
- Support for the Nextivity WAVE mobile & desktop applications.
- End-to-end cellular communication encryption without additional risk of vulnerability.
- Mounting brackets included with every unit.

Wireless Features

- Supports LTE (FDD).
- **Up to 100dB of system gain in each band, simultaneously.**
- Bluetooth Low-Energy (BT LE) communications with mobile handsets.
- Max EIRP for Multiple carriers: 10 dBm downlink and 22 dBm uplink, per band.
- Wirelessly (5GHz U-NII) linked Network and Coverage Units.
- Peaceful coexistence with adjacent Wi-Fi (2.4 GHz & 5 GHz), femtocell, and cellular devices.
- Software-based optimization of integrated antenna coverage pattern which maximizes system gain and provides improved coverage and signal quality.
- Automatic Gain Control (AGC) based on fast real-time echo-cancellation.

- Advanced digital echo-cancellation (>30dB) and channel select filtering algorithms.
- Cel-Fi manages the power levels between the cell tower and user devices.
- Extremely linear RF front end.
- Adaptive signal equalization.
- Includes Nextivity's 3rd-generation six-core ARES chipset.

Mobile Network and Network Protection Features

- Up to three (3) cellular bands supported; relays two (2) simultaneously.
- Will work with Verizon Wireless LTE and XLTE
- Cel-Fi DUO+ simultaneously supports multiple channels with bandwidths anywhere from 5 to 20 MHz per radio with a total system relay bandwidth of 35 MHz.
- Support for 3GPP Rel. 10 features.
- Support for E-UTRA bands 2, 13, and 4 LTE.
    (Other configurations are available)
- Seamless integration with the Macro networks.
- Cel-Fi boosts service only for the Operator PLMNIDs the device is authorized and configured for.
- Remote Access from the cloud to the Cel-Fi device (optional).
- Secure and ciphered provisioning.
- Software-managed system intelligence prevents uplink system gain from exceeding path loss, eliminating unnecessary rise in base station noise level.
- Uplink Muting Mode automatically shuts down uplink cellular transmissions when no active user equipment is detected.
- System Registration options available.
- Location Lock, which ensures the device is only being used in the location it was deployed (optional).

System Benefits

- Indoor cellular coverage!
- Anyone can install the device. No special tools or knowledge required. No external antennas needed. Simply plug-in to power.
- Attractive design can be displayed, or easily placed into the background.
- No setup or ongoing maintenance needed, nor reliance upon internet, GPS, or handsets to be registered with the system.
- No additional equipment or professional installation required for full performance.
- The three-hop two unit wireless system eliminates the requirements and installation restrictions associated with cabled connections.
- Users can be assured communications are secure, through the encrypted wireless link.
- The included mounts allow for the system to be wall-mounted for maximum spatial flexibility.
- Registration, Software Updates, and Engineering application support, with the Wave mobile app.
- Any subscriber device on boosted network will benefit from improved coverage.
- Multiple systems can be deployed without concern for mutual interference.
- User Interface (UI) display allows quick and easy set-up by end-user. Provides instant visual feedback, with each unit displaying system information.
- Architecture allows user to place the Coverage Unit where it's needed and the Network Unit where it gets the best donor signal.
- Simplified remote maintenance of devices in the field, with Nextivity Wave cloud access.

Wireless Benefits

- Clear and reliable voice connections within coverage area — up to 15,000 ft^2 (1,400 m^2), or more.
- Bluetooth enables the system to communicate with smart phones and the Cel-Fi *WAVE* mobile app, improving the user experience and adding capability to the product.
- Cel-Fi remains fully functional, even when there are other RF emitters present.
- Ensures maximum gain - best coverage - at all times in ever changing RF environments, without user intervention.
- Subscriber devices enjoy improvements in battery life.
- Linearity virtually eliminates all IMD desense issues.
- The highest performance, fully-certified, signal booster possible in its power class.
- Maximizes signal-to-noise (SNR) ratio - provides better data rates without negatively impacting macro cells.
- Real-time adapting capability ensures the best possible user experience, in actual user environments, which are constantly changing, and have a variety of Wi-Fi types and cellular signals present.

Mobile Network and Network Protection Benefits

- Supports most network configurations of LTE for maximum interoperability.
- Seamless call handoff between Cel-Fi systems or the macro.
- Easily supports multiple band and frequency configurations on a cellular network with one device.
- Reduce returns, customer care calls, and provide the best product experience to users.
- Unlike wideband amplifiers, ensure the equipment capex benefits only your network — third-party macro cells are completely unaffected by Cel-Fi DUO+.
- Network operators can be assured Cel-Fi devices are being used as intended, with registration and location lock options.
- Completely network safe, doesn't degrade macro capacity.
- Registration options allow control over device deployment and may be used to prevent unintended use.
- Ultimate control of the installed devices resides with the network operator.

Environmental

- Operating temperature: 0° to 40°C
- Storage temperature: -25° to 60°C
- Relative humidity: 5% to 95%, noncondensing
- RoHS II 2011/65/EU
- WEEE (2002/96/EC)
- ErP 2009/125/EC

Power

- 12 VDC via external supply (two included)
- External supply: 100 to 240 VAC, 47 – 63Hz
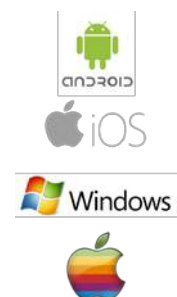- Power consumption less than 15W per unit

Physical Specifications

NETWORK UNIT:	COVERAGE UNIT:
158.5x146x59mm	158.5x146x59mm
560g	390g

Get Cel-Fi WAVE at:
cel-fi.com/wave

X NEXTIVITY

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Radio Specifications

RF Specification	Radio 1	Radio 2	Radio 3
D32-2/13/66	Band 2	Band 13	Band 4
Frequency DL	1930-1990 MHz	746-756 MHz	2110-2155 MHz
Frequency UL	1850-1910 MHz	777-787 MHz	1710-1755 MHz
Duplex Distance	80 MHz	-31 MHz	400 MHz
Maximum Relay BW	20 MHz	10 MHz	20 MHz
	35 MHz Combined		
UL TX Power Max EIRP	22 dBm	20 dBm	22 dBm
DL TX Power Max EIRP	10 dBm per 5 MHz	10 dBm per 5 MHz	10 dBm per 5 MHz

Standards**

FCC Parts:

15, 20, 22, 24, 27	UL 62368-1
EN 301 489 -1, 17, 23	CSA C22.2#62368-1
	IEC/EN 62368-1
EN 301 893	3GPP TS 25.143 Rel.10
EN 301 908-1, 11, 15	3GPP TS 36.143 Rel.10
EN 300-328	EN 50566/62209-2/62479 (SAR)
EN 62311	Bluetooth SIG

Note: Certifications are regional; not all products need or have the same certifications. Please check the specific model number to determine exactly which certifications it has.

Models (Band Class support) available

Some models also available as a single band device.

Patents & Design

This product is covered by Nextivity, Inc., patents and patents pending. Designed by Nextivity, Inc., in San Diego, California, USA Please refer to CEL-FI.com for details.

Data Sheet DUO English 15 0605