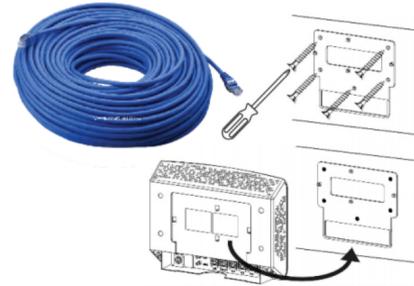# Cel-Fi QUATRA: Hardware Checklist

## Antennas
### (NU Donor, and optional CU)

- ☐ MIMO/Dual-Feed Antenna(s)
- ☐ Antenna location identified
- ☐ Antenna mounting hardware
- ☐ Building entrance point for cabling, and weatherproofing
- ☐ Grounding and lightning protection if needed
- ☐ Coaxial cable feeds of proper length
- ☐ RF adapters to QMA

## NU and CU Mounting

- ☐ NU location, mounting hardware, power outlet
- ☐ NU Internet connection (local wired LAN[1], alternate cellular modem[2], WiFi Extender with Ethernet port[3])
- ☐ CU mounting locations and method hardware
- ☐ Write down NU serial numbers for commissioning

## NU To CU Ethernet Cabling

- ☐ Cable routes and lengths (new cables or existing LAN without routers/switches etc.)
- ☐ QREs if between 325 ft (100 m) and 650 ft (200 m) in length

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[1] The Ethernet port with Internet access should ideally be provided by the end customer IT or building facilities department.
[2] I.e. a router with 3G/4G module to connect to the Internet and local Ethernet ports connected to the Cel-Fi Quatra NU
[3] I.e. a device that connects to the building Wi-Fi and presents an Ethernet port to the Cel-Fi Quatra NU

# Cel-Fi QUATRA: Process Flow



## Training & Wave Portal Access
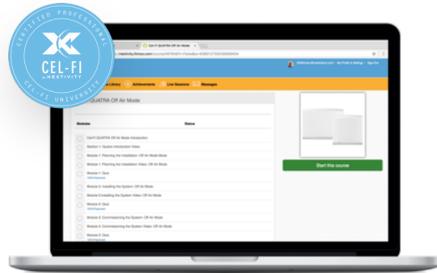
- Watch the Quatra intro video at www.cel-fi.com/quatra
- Request portal access at www.cel-fi.com/account-request
- Complete the on-line Cel-Fi University course (30 min) that is emailed to you.
- Upon course completion, you will receive your portal login email invite.
- Before any install, contact your distributor if you don't see your Network Unit (NU) serial numbers under the Access tab of the portal.

## Site Survey & Planning

- Define the building: Address, size, interior wall materials (framed, concrete), ceiling (solid, suspended, open), and photos of areas (usage)
- Use the QUATRA BOM Estimator tool (www.cel-fi.com/quatra/plan) to estimate HW needs (adjust later as plan details dictate).
- Decide which Operators need better service (which Cel-Fi QUATRA systems are needed)?
- Ask customer where service is good/ poor/critical. They know! And they have expectations to meet.
- Measure existing cell service quality using Smartphone speedtests or network signal apps.
- Choose donor antenna location(s), or other donor source for best signal quality and data rates.
- Choose locations for NU/CU equipment. NU-CU must be a minimum of 10m (35ft) apart, and no CU near Donor antenna.
- Work with local IT staff to authorize NU internet access (send them the Cel-Fi QUATRA Management Connection Guide).

## Install
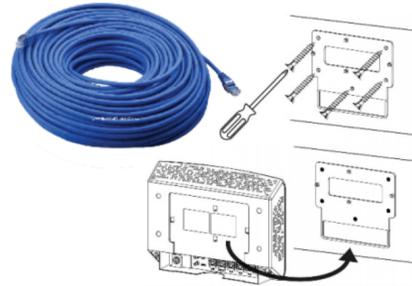
- Coordinate LAN/Internet connectivity so it's ready when needed (permanent LAN is best, temporary at a minimum for commissioning).
- Run cables and mount all hardware.
- Connect all cables, connect NUs to internet, and power up the systems.
- If using a small cell donor, keep Small Cell Interface Input and Output cables separate to maintain isolation between them.

## Commission
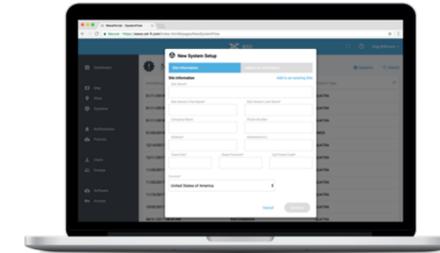
- On the Wave Portal, go to the New Systems list and select your system by NU serial number.
- Complete the guided steps.
- When completed, your system will enable and appear on the Map, Site, System pages.
- Use the Request Access feature under the Access tab menu to gain access to your NU if you don't see it on the portal.

## Evaluate & Optimize (if needed)

- Clear any alarms (visible on the portal for the System, or indicated by NU/CU LEDs). Help provided on Portal, User Manual, and at www.cel-fi.com/support
- Select NU to check donor signal health (LTE: RSRP/RSRQ/SINR, WCDMA: RSCP/EcIo)
- To improve signal quality, aim the donor antenna for better LTE SINR and RSRQ on all LTE radios.
- Select one CU to check Downlink Echo Gain for each Radio A/B/C/D. If CUs are well isolated from the NU and Donor antenna, Echo Gain will be less than -10 dB (example -11 dB). If Echo Gain is -10 dB or -9 dB, connect individual CUs (all others disconnected) and observe Echo Gain to find the CUs that should be better isolated. Also remove other cellular solutions that operate on the same channels (no longer needed and may interfere).