

CEL-FI QUATRA 1000

3G / 4G / LTE

In-building Cellular Solution

DATA SHEET

MODEL NUMBERS:
Q34-2/4/5/12NU
Q34-2/4/5/12CU

Cel-Fi QUATRA 1000 is a scalable in-building cellular solution that is both a cost-efficient and easy-to-deploy solution, delivering high-quality signal in venues up to 200,000 square feet (19,000 square meters). It is a hybrid solution that combines the best of active DAS and Smart Booster technologies. It operates in off-air mode or can be integrated with carrier small cell equipment and operated in distributed small cell mode, creating a Supercell.



Benefits:

- **Lowest costs per ft²**
- **Scalable Coverage and Capacity for Up to 200,000 ft² (19,000 m²)**
- **Designed for Off-Air or Small Cell Applications**
- **Easiest-to-Deploy with Signal Quality Maximized by AntennaBoost**
- **Remote Monitoring and Management via Cel-Fi WAVE Portal**

System Features

Enterprise-class, carrier-grade, small footprint active DAS

MIMO RF inputs for (a) small cell donor or (b) external off-air donor antenna
Network Unit (NU) (Head End) attaches to Coverage Unit (CU) (Remote Unit) via Cat 5e cable
A single NU and up to four (4) CUs may be attached (hub and spoke architecture) in a Cel-Fi QUATRA system
Multiple Cel-Fi QUATRA systems may be deployed to increase coverage footprint
Up to 325 ft (100 m) range from NU to CU
Cel-Fi QUATRA Range Extender (QRE) (optional) may be used to increase NU-to-CU distance to 650 ft (200 m)
Remote Management through Nextivity's Cel-Fi WAVE cloud platform
Easiest installation in its class
Glanceable LED User Interface (UI)
Supporting smart phone application (QMT)
Mounting hardware included

Wireless Features

Supports up to four (4) bands simultaneously from a single operator

3G/4G/LTE support (WCDMA / HSPA+ / LTE)
Supports FDD
MIMO (in two bands, see table below for specifics per model)
Up to 100dB system gain per band (in Off-Air mode)
Peaceful coexistence with adjacent Wi-Fi (2.4 GHz & 5 GHz), femtocells, and cellular devices
Advanced digital echo-cancellation (>30dB) and channel select filtering algorithms
Active management of the cellular link between the Base Station and user devices
Automatic Gain Control (AGC) based on fast real-time echo-cancellation
Linear RF front end
Adaptive signal equalization
Uses Nextivity's 3rd-generation "ARES" chipset

Mobile Network and Network Protection Features

Global band combinations available for Americas, Europe, Asia, Oceania, and Africa
Systems are pre-configured for a single carrier (network operator)
Integration, handover, and handoff with the macro network
Supports multiple channels with bandwidths of 3.84/5/10/15/20 MHz per channel
Works with any user equipment (UE) for the configured network (no whitelist/blacklist)
Up to 75 MHz system relay bandwidth
Support for 3GPP Release 10 features
Provider-specific system: Cel-Fi QUATRA distributes and boosts service only for the Operator PLMNIDs for which the device is authorized and configured
Secure and ciphered provisioning
System intelligence accurately establishes proper safe uplink power in real time
Uplink Muting Mode automatically shuts down uplink cellular transmissions when no active user equipment is detected
System shuts down upon Operator's network command or failure detection

Benefits

Easiest to deploy Active DAS Hybrid
Distribute and boost cellular coverage indoors

3G and 4G support, Voice and Data, network safe

Coverage footprint provided via Power over Ethernet (PoE); no requirement for additional power source at CU (RU)

System can accept various Donor signal inputs: Small Cell; OTA (off-air) via external antenna; and, OTA via internal donor antenna

Donor Antenna (Small Cell input required)

Attach to Small Cell, mitigates local macro capacity and interference issues

Simplest Installation: NU (Head End) and CU (RU) connect with Cat 5e-rated (or better) cable

Scalable architecture allows multiple Cel-Fi QUATRA systems to be deployed in the same environment for larger footprint (small cell input required)

LED cues provides visual feedback for ease of setup and status

Works with any subscriber device from the configured Operator

QMT (QUATRA Management Tool) smartphone app further simplifies installation

System management from the cloud through the Cel-Fi WAVE platform

Wall and ceiling mounting options

Wireless Benefits

Clear and reliable cellular connections within coverage area up to 50,000 ft² (5000 m²) per system

Highest gain (100dB) provides best coverage footprint

Advanced Echo-Cancelation allows Cel-Fi QUATRA to transmit more power without feedback interference

Subscriber devices require less transmit power for improved battery life

Linearity eliminates IMD desense issues

Dynamic gain control ensures maximum gain—best coverage—at all times in ever changing RF environments, without user intervention

Nextivity purpose-built, high-performance, six core ASIC processor, provides best performance at lowest cost

Mobile Network Benefits

Flexibly deploy in LTE, VoLTE, LTE-Advanced, and WCDMA networks, with multiple cellular bands, simultaneously

Automatically adjusts channel bandwidths from 3.84 MHz to 20 MHz

Sufficient relay bandwidth (75 MHz) to support SISO and MIMO in multiple bands

Off-load the macro network, or use to improve macro capacity and building propagation/penetration

Cel-Fi QUATRA system improves users' cellular experience while remaining invisible to networks and UEs: no gateways or third-party software needed

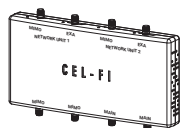
UE control is transparent and remains centralized in the network core (no gateways or third-party software)

Variants

Model Number (base)	Bands Supported	MIMO Support	Crossover Support
Q34-2/4/5/12	2, 4, 5, 12	4, 12	2, 5
Q34-2/4/5/13	2, 4, 5, 13	4, 13	2, 5
Q34-1/3/8/20	1, 3, 8, 20	3, 20	1, 8
Q34-1/3/7/8	1, 3, 7, 8	3, 7	1, 8
Q34-1/7/8/20	1, 7, 8, 20	7, 20	1, 8
Q34-3/5/7/28	3, 5, 7, 28	7, 28	3, 5

*Crossover Support allows 3G and LTE to exist simultaneously in these bands

Small Cell Interface Kit (SCIF) #Q34-SCI



The Cel-Fi QUATRA SCIF is designed to simplify connecting a Small Cell to one or two Cel-Fi QUATRA Network Units.

The SCIF may be ordered separately (a second NU requires purchase of two additional connection cables)

Connects a small cell to up to four Cel-Fi QUATRAs (additional cables or splitters may apply)

Provides port isolation and attenuation

Supports small cells with one or two band dependent RF feeds per MIMO channel

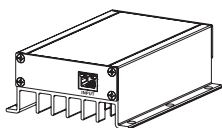
SMA connectors (50 ohm)

Includes Input and Output cables

699–2690 MHz

1 watt max input power on all ports

QUATRA Range Extender (QRE) #Q34-E1000



The Cel-Fi QUATRA Range Extender is a Power over Ethernet (PoE) device that allows Cel-Fi QUATRA Network Unit (NU) to Coverage Unit (CU) interconnect cable lengths up to 650 ft (200 m). Plug and Play installation.

Power over Ethernet (PoE)

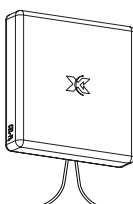
Extends NU to CU cable to 200 meters

Supports Cel-Fi QUATRA proprietary protocols

Intuitive LED interface

Note: Will not support other (non Cel-Fi QUATRA) PoE devices

Wideband MIMO Panel Antenna #A52-X12-100



The Wideband MIMO Panel Antenna may be used as an Off-Air (OTA) donor source

MIMO Directional Panel Antenna

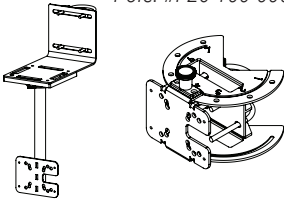
Integrated antenna cables (200 cm)

Ceiling/Wall/Pole mount hardware included

Cel-Fi Mounts

Indoor: #F66-100-000

Pole: #F26-100-000



Indoor/outdoor mounts designed to secure a donor signal antenna for Cel-Fi QUATRA and work with the Cel-Fi WAVE Antenna Positioning Application

A rugged outdoor pole mount, designed for mounting antenna externally to a pole, and supporting the Antenna Positioning Application

Power

(Network Unit only)

54 VDC @ 2.22 Amp via external supply (51.3 to 56.7 VDC tolerance)

External supply: 100 to 240 VAC, 47 – 63 Hz

Power consumption less than 120W max

Network Unit provides power to Coverage Units over Cat 5e (PoE)

Environmental

Operating temperature: 0° to 40°C

Storage temperature: -25° to 60°C

Convection Cooling

Relative humidity: 0% to 95%, noncondensing

RoHS II 2011/65/EU

IP20

Installation

Mounting hardware included

NU may be wall mounted (solid or hollow)

CUs may be wall or ceiling mounted

1 NU supports 1 to 4 CUs

iBwave VEX files available

Radio Performance

(check product version for specific band support)

Band	Downlink	Uplink	Boost
1	2110-2170 MHz	1920-1980 MHz	Up to 20 MHz contiguous boost BW, HSPA or LTE SISO
2	1930-1990 MHz	1850-1910 MHz	Up to 20 MHz contiguous boost BW, HSPA or LTE SISO
3	1805-1880 MHz	1710-1785 MHz	Up to 20 MHz contiguous boost BW, HSPA or LTE MIMO
4	2110-2155 MHz	1710-1755 MHz	Up to 20 MHz contiguous boost BW, HSPA or LTE MIMO
5	869-894 MHz	824-849 MHz	Up to 15 MHz contiguous boost BW, HSPA or LTE SISO
7	2620-2690 MHz	2500-2570 MHz	Up to 20 MHz contiguous boost BW, LTE MIMO
8	925-960 MHz	880-915 MHz	Up to 15 MHz contiguous boost BW, LTE SISO
12	729-746 MHz	699-716 MHz	Up to 10 MHz contiguous boost BW, LTE MIMO
13	746-756 MHz	777-787 MHz	Up to 10 MHz contiguous boost BW, LTE MIMO
20	791-821 MHz	832-862 MHz	Up to 20 MHz contiguous boost BW, LTE MIMO
28	758-788 MHz	703-733 MHz	Up to 20 MHz contiguous boost BW, LTE MIMO

Total boost all-channel bandwidth 75 MHz (2x2 MIMO uses double bandwidth per channel)

DL Maximum NU in-band donor level -40dBm

DL Maximum NU survival donor level 30dBm

UL Maximum CU donor level -20dBm

Maximum UL power 22dBm bands 1, 2, 3, 4, 7

Maximum UL power 20dBm bands 5, 8, 12, 13, 20, 28

Maximum DL power 10dBm per 5 MHz bands 1, 2, 3, 4, 7

Maximum DL power 10dBm per 5 MHz bands 5, 8, 12, 13, 20, 28

LTE 5/10/15/20 MHz and WCDMA 3.84/5MHz bandwidths

Physical Specifications

Network Unit	Coverage Unit
250x188x55mm	188x188x50mm
1.2 kg (40.8 oz.)	0.83 kg (29.2 oz.)

Connections

4x CU RJ45 Proprietary Gigabit link

100 m max CU cable length Cat 5e

200 m max CU cable length with Cel-Fi QUATRA Range Extender (Cat 5e or Cat 6)

PoE IEEE 802.3at

RJ45 LAN management port (10/100 Fast Ethernet)

RJ45 LAN management output port (10/100 Fast Ethernet)

2x MIMO External RF Input (QMA Female 50 ohm)

Compliance

(check individual product version for specific regional compliance)

3GPP TS 25.143 Rel.10

3GPP TS 36.143 Rel.10

CE

FCC Part 15, 20, 22, 24, 27

ISED Canada

UL 62368-1/CSA C27.2

Bluetooth BQB

RCM

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.

Patents & Design

Cel-Fi QUATRA products are 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.

Specifications subject to change without notice.

System Management

(Software)

Cel-Fi QUATRA Management Tool (QMT) (beta coming soon!)

Cel-Fi WAVE cloud portal

Cel-Fi WAVE Remote Management:

- Status (list and map)
- Commissioning
- Diagnostics
- Software Updates
- Settings
- Reporting
- Alarms & Notifications

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CEL-FI[™] QUATRA 2000

3G / 4G / LTE

In-building Cellular Solution

DATA SHEET

MODEL NUMBERS:
Q34-4/5/12/13/25NU_EXA
Q34-4/5/12/13/25CU_EXA

Cel-Fi QUATRA 2000 is a scalable in-building cellular solution that is both a cost-efficient and easy-to-deploy solution, delivering high-quality signal in venues up to 200,000 square feet (20,000 square meters). It is a hybrid solution that combines the best of active DAS and Smart Booster technologies. The Cel-Fi QUATRA 2000 operates by capturing the signal from the outside macro networks, boosting them, and relaying their signals indoor from the coverage units.



Benefits:

- **Lowest Solution Costs per ft²**
- **Scalable Coverage for 200,000 ft² (20,000 m²), and Beyond**
- **Easiest-to-Deploy**
- **Remote Monitoring and Management via Cel-Fi WAVE Platform**

System Features

Enterprise-class, carrier-grade, small footprint active DAS

RF inputs for external off-air donor antenna (A11-V14-100)
Network Unit (NU) (Head End) attaches to Coverage Unit (CU) (Remote Unit) via Cat 5e cable
A single NU and up to four (4) CUs may be attached (hub and spoke architecture) in a Cel-Fi QUATRA 2000 system
Multiple Cel-Fi QUATRA 2000 systems may be deployed to increase coverage footprint
Up to 325 ft (100 m) range from NU to CU
Cel-Fi QUATRA Range Extender (QRE) (optional) may be used to increase NU-to-CU distance to 650 ft (200 m)
Remote Management through Nextivity's Cel-Fi WAVE cloud platform
Easiest installation in its class
Glanceable LED User Interface (UI)
Mounting hardware included

Wireless Features

Supports up to two bands simultaneously from two operators

3G/4G/LTE support (CDMA / WCDMA / HSPA+ / LTE)
Supports FDD
Up to 100dB system gain per band (in Off-Air mode)
Peaceful coexistence with adjacent Wi-Fi (2.4 GHz & 5 GHz), femtocells, and cellular devices
Advanced digital echo-cancellation (>30dB) and channel select filtering algorithms
Active management of the cellular link between the Base Station and user devices
Automatic Gain Control (AGC) based on fast real-time echo-cancellation
Linear RF front end
Adaptive signal equalization
Uses Nextivity's 3rd-generation "ARES" chipset

Mobile Network and Network Protection Features

Dual-carrier combinations available: AT&T and Verizon; Sprint (FDD) and T-Mobile
Integration, handover, and handoff with the macro network
Supports multiple channels with bandwidths of 3.84/5/10/15/20 MHz per channel
Works with any user equipment (UE) for the configured networks (no whitelist/blacklist)
Up to 75 MHz system relay bandwidth
Support for 3GPP Release 10 features
Provider-specific operation: Cel-Fi QUATRA 2000 distributes and boosts service only for the Operator PLMNIDs for which the device is authorized and configured
Secure and ciphered provisioning
System intelligence accurately establishes proper safe uplink power in real time
Uplink Muting Mode automatically shuts down uplink cellular transmissions when no active user equipment is detected

Benefits

Easiest to deploy Active DAS Hybrid
Distribute and boost cellular coverage indoors
3G and 4G support, Voice and Data, network safe
Coverage footprint provided via Power over Ethernet (PoE); no requirement for additional power source at CU (RU)

Donor Signal

Simplest Installation: NU (Head End) and CU (RU) connect with Cat 5e-rated (or better) cable
Scalable architecture allows multiple Cel-Fi QUATRA systems to be deployed in the same environment for larger footprint
LED cues provides visual feedback for ease of setup and status
Works with any subscriber device from the configured carrier
System management locally or from the cloud through the Cel-Fi WAVE platform
Wall and ceiling mounting options

Wireless Benefits

Clear and reliable cellular connections within coverage area up to 50,000 ft² (5000 m²) per system, and beyond
Highest gain (100dB) provides best coverage footprint on location
Advanced Echo-Cancellation allows Cel-Fi QUATRA 2000 to transmit more power without feedback interference
Subscriber devices require less transmit power for improved battery life
Linearity eliminates IMD desense issues
Dynamic gain control ensures maximum gain—best coverage—at all times in ever changing RF environments, without user intervention
Nextivity purpose-built, high-performance, six core ASIC processor, provides best performance at lowest cost

Mobile Network Benefits

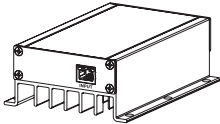
Flexibly deploy in LTE, VoLTE, LTE-Advanced, CDMA and WCDMA networks, with multiple cellular bands, simultaneously
Automatically adjusts channel bandwidths from 3.84 MHz to 20 MHz
Sufficient relay bandwidth (75 MHz) to support SISO in multiple bands
Off-load the macro network, or use to improve macro capacity and building propagation/penetration
Cel-Fi QUATRA 2000 system improves users' cellular experience while remaining invisible to networks and UEs: no gateways or third-party software needed
UE control is transparent and remains centralized in the network core (no gateways or third-party software)

Variants

Model Number	Bands Supported	Carrier Configurations Available
Q34-4/5/12/13/25	4, 5, 12, 13, 25	AT&T & Verizon T-Mobile & Sprint

QUATRA Range Extender (QRE)

#Q34-E1000

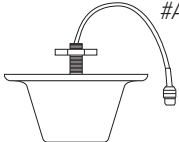


The Cel-Fi QUATRA Range Extender is a Power over Ethernet (PoE) device that allows Cel-Fi QUATRA 2000 Network Unit (NU) to Coverage Unit (CU) interconnect cable lengths up to 650 ft (200 m). Plug and Play installation.

Power over Ethernet (PoE)
Extends NU to CU cable to 650 ft (200 m)
Supports Cel-Fi QUATRA 2000 proprietary protocols
Intuitive LED interface
Note: Will not support other (non Cel-Fi QUATRA 2000) PoE devices

Indoor Omni Antenna

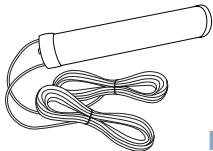
#A11-V43-100



The Wideband Indoor Dome Server Antenna receives and transmits signal in a 360° pattern
Compatible with the 698 – 2700 MHz frequency ranges that include 3G and 4G signals
Omni-Directional
SMA Male connector

Wideband Omni Donor

#A11-V14-100



The Wideband Omni-Directional MIMO Antenna is perfect for use as an outdoor cellular donor signal source
698 – 2700 MHz
N-type Female (x2)

Power
(Network Unit only)

54 VDC @ 2.22 Amp via external supply (51.3 to 56.7 VDC tolerance)
External supply: 100 to 240 VAC, 47 – 63 Hz
Power consumption less than 120W max
Network Unit provides power to Coverage Units over Cat 5e (PoE)

Environmental

Operating temperature: 0° to 40°C
Storage temperature: -25° to 60°C
Convection Cooling
Relative humidity: 0% to 95%, noncondensing
RoHS II 2011/65/EU
IP20

Installation

Mounting hardware included
NU may be wall mounted
CUs may be wall or ceiling mounted
1 NU supports 1 to 4 CUs
iBwave VEX files available

Radio Performance
(check product version
for specific band support)

Band	Downlink	Uplink	Boost
4	2110-2155 MHz	1710-1755 MHz	Up to 20 MHz contiguous boost
5	869-894 MHz	824-849 MHz	Up to 15 MHz contiguous boost
12	729-746 MHz	699-716 MHz	Up to 10 MHz contiguous boost
13	746-756 MHz	777-787 MHz	Up to 10 MHz contiguous boost
25	1930-1995 MHz	1850-1915 MHz	Up to 20 MHz contiguous boost

Total boost all-channel bandwidth 75 MHz
 DL Maximum NU in-band donor level -40dBm
 DL Maximum NU survival donor level 30dBm
 UL Maximum CU donor level -20dBm
 Maximum UL power 24dBm EIRP bands 4, 25
 Maximum UL power 20dBm EIRP bands 5, 12, 13,
 Maximum DL power 10dBm per 5 MHz EIRP all bands
 LTE 5/10/15/20 MHz and WCDMA 3.84/5MHz bandwidths

Physical Specifications

Network Unit	Coverage Unit
250x188x55mm	188x188x50mm
1.2 kg (40.8 oz.)	0.83 kg (29.2 oz.)

Connections

4x CU RJ45 Proprietary Gigabit link
 100m max CU cable length Cat 5e
 200m max CU cable length with Cel-Fi QUATRA Range Extender (Cat 5e or Cat 6)
 PoE IEEE 802.3at
 RJ45 LAN management port (10/100 Fast Ethernet)
 RJ45 LAN management output port (10/100 Fast Ethernet)
 2x External RF Input (QMA Female 50 ohm)

Compliance
(check individual product version
for specific regional compliance)

3GPP TS 25.143 Rel.10
 3GPP TS 36.143 Rel.10
 FCC Part 15, 20, 22, 24, 27
 ISED Canada
 UL 62368-1/CSA C27.2
 Bluetooth BQB

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System Management
(Software)

Cel-Fi WAVE cloud portal
 Cel-Fi WAVE Remote Management:

- Status (List and Map)
- Commissioning
- Diagnostics
- Software Updates
- Settings
- Reporting
- Alarms & Notifications

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