LTE CPE SOLUTION

Cross polarization
High speed
Long-range coverage

Comba

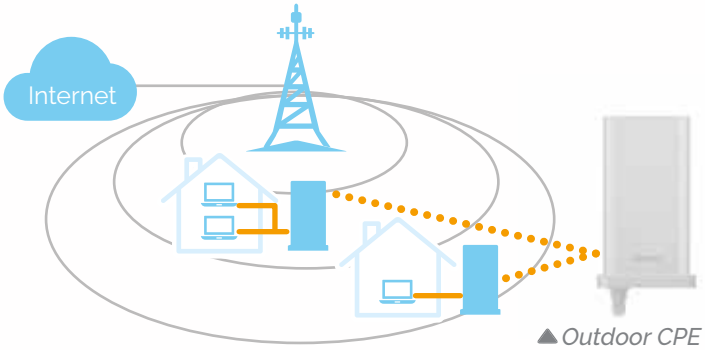
Compact, agile, durable
all-in-one solution

A complete solution for wireless system enhancement to maximize outdoor-to-indoor connectivity and coverage is needed when

- outdoor environment is crowded with trees, buildings and large steel structures
- high building penetration loss particularly in high band
- a majority of mobile phones does not support Band B42/B48 (3.5GHz)

Pragmatic and reliable for **outdoor-to-indoor** wireless enhancement

Comba **CPE** provides a compact solution for extending the reach of outdoor wireless mesh networks to indoors. It enables operators deploying municipal and enterprise wireless networks to maintain optimal user experience and connectivity anywhere.



▲ *Outdoor CPE*

This LTE CPE is a cost-effective integrated wireless broadband access equipment that

complies with 3GPP Release 11 Category 6/12

provides high data rates with 20MHz+20MHz carrier aggregation

supports smart antennas with MIMO technology

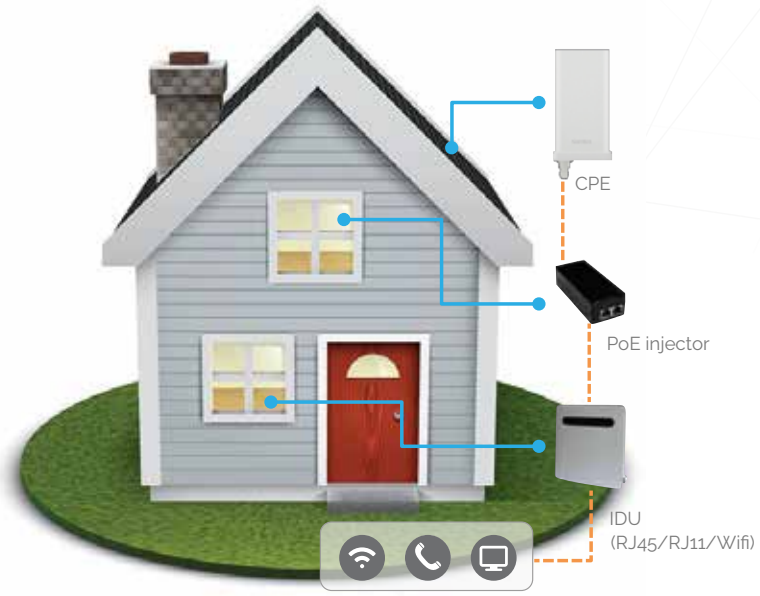
Mechanically protected by its IP65 compliant structure, the device's in-built integrated high-gain dual polarization directional antenna enables high-speed data access, making it an absolutely ideal solution to enhance outdoor-to-indoor wireless connectivity.

Significant features for a complete solution

RF design

Highly integrated software features for upgrade

Web-based friendly Interface for easy monitoring



How does the system work?

Comba's LTE CPE solution provides end-to-end network visibility and control for the entire mesh and access infrastructure, consisting of CPE with internal high gain antenna placed outdoor, injector giving Power over Ethernet from indoor, and indoor unit supporting fixed line access, Wi-Fi and telephone interface (VoIP).

Enhancing wireless broadband access

Base station range or throughput improved on UL/DL

The Power over Ethernet-enabled CPE delivers up to **10dBi terminal antenna gain** that allows more margin for link budget.

Its ruggedized mechanical feature fits for outdoor deployment of office buildings and multi-dwelling units to negate building penetration loss from outside to inside.

▲ *LTE CPE with embedded antenna*

Flexibility and versatility. Comba's CPE is equipped with **built-in antenna**, enabling the adaptation to both indoor and outdoor product families.

With Comba's in-house design ability, the CPE can support **3GPP**, **non-3GPP** or **special band**, and adapts to ISP or private network license or band, e.g. 1785-1805MHz

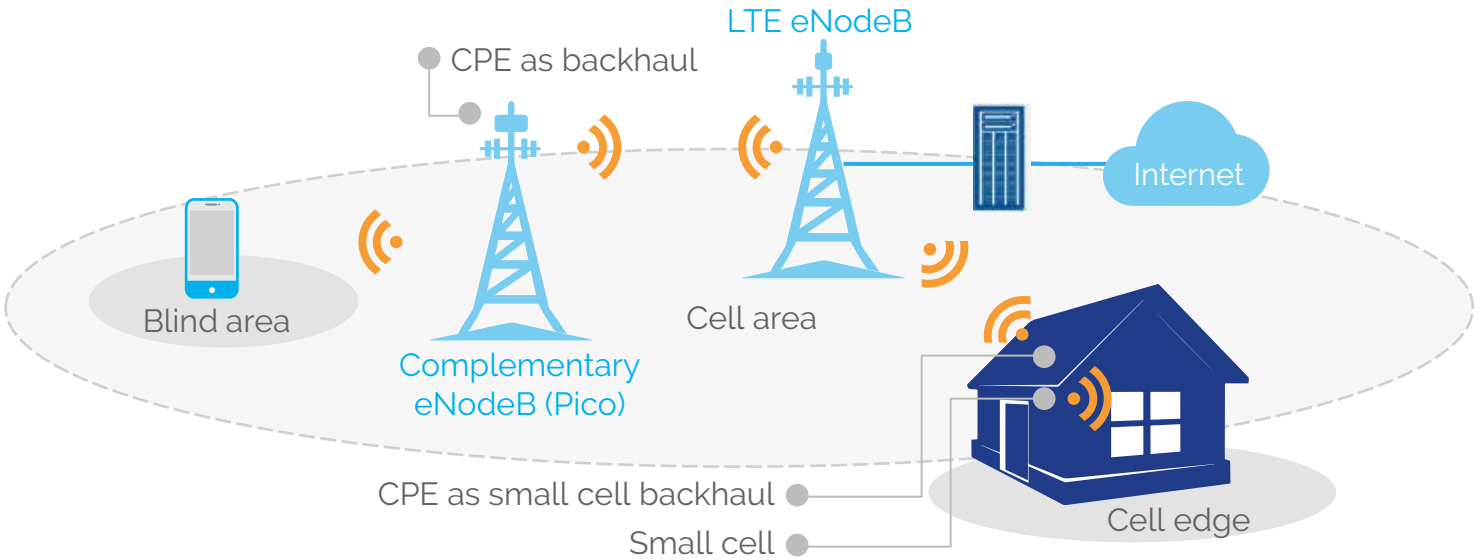
Easy installation and maintenance. The device comprises **signal strength indicator** and **buzzer voice indicator** for fast installation and maintenance.

Comba's CPE solution can help you when

- network transmission is weakened in blind area within cell area or cell edge
- losing signals in poor propagation condition on the direct link between base station and terminal
- installation condition for fiber or MW backhaul is unfavorable

Improving signal strength and long-range coverage

Comba LTE CPE is co-installed with the complementary eNodeB, connecting EPC via existing eNodeB as the backhaul anchor to create a relay-like topology that provides redundancy of coverage and excellent signal availability.



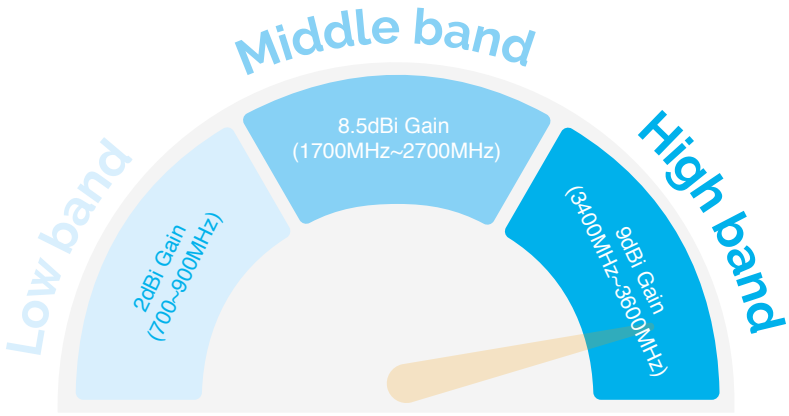
▲ *CPE solution for base station backhaul*

Accountability and resilience. Comba's **high antenna gain (12~16dBi) CPE** on dedicated band creates great data link even in areas where ordinary terminals are not working. Its outdoor design offers high flexibility for network planning.

High adaptability. The device has the ability to take up existing LTE cell as backhaul link and to serve as a **bridge between FDD & TDD system**.

High gain compact antenna for easy adjustment to best signal receiving

Given the in-house cross-polarized antenna design, the CPE enables adjustment for signal reception from high, middle to low bands. This special feature gives high flexibility for use in different targeted areas.

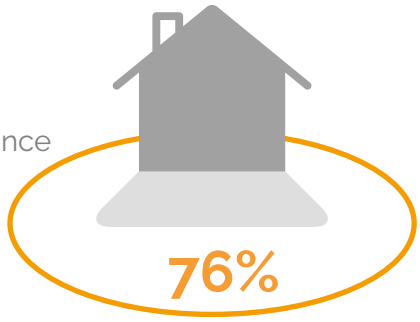


Comba's CPE Performance

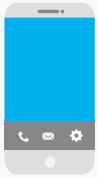
8~15dB improvement compared to indoor deployment

*SPM model, -90dBm edge signal level.

76% coverage distance improvement*

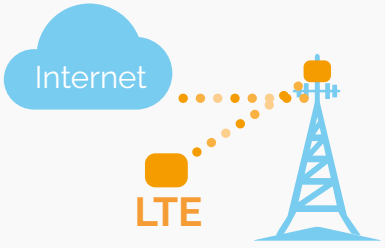


The complete solution is designed for



Mobile Broadband

Private Network



Base Station Backhaul

In-Vehicle Service

CP2600-OP, A10 4G LTE CPE

Designed for **3GPP Release 11 Category 6** with high data rates up to **40MHz carrier aggregation**, the CP2600-OP, A10 4G LTE CPE also combines a robust **IP-65** compliant enclosure with an integrated high-gain dual polarization directional antenna, making it an effective system for outdoor-to-indoor wireless enhancement.

- 1000Mbps shielded PoE Port (RJ45)
- Compliant with IEEE802.3/802.3u
- MDI/MDIX auto-sensing
- Status LEDs
- Support 1.8V/3.0V 2FF Standard USIM
- Voice indication for easy installation

Electrical Specifications

	Input	Output
Power Adapter	100 VAC~240VAC 50Hz~60Hz	24V, 500mA (PoE)
CPE Power Consumption	<7W	

LTE Specifications

Frequency Band	UL	DL
LTE-FDD Band 2:	1850MHz – 1910MHz	1930MHz – 1990MHz
LTE-FDD Band 3:	1710MHz – 1785MHz	1805MHz – 1880MH
LTE-FDD Band 7:	2500MHz – 2570MHz	2620MHz – 2690MHz
LTE-FDD Band 28B:	718MHz – 748MHz	773MHz – 803MHz
LTE-TDD Band 42:	3400MHz – 3600MHz	
Non 3GPP-band TDD	*1785MHz – 1805MHz*	*1900MHz – 1920MHz*
Carrier Aggregation Ability	35MHz FDD-LTE 2CC CA	40MHz TDD-LTE 2CC CA
Tx/Rx Path	1 Tx 2 Rx	
Channel Bandwidth	5/10/15/20 MHz	
Tx Power	23dBm +/- 2dBm	
Rx Sensitivity	-94dBm (20MHz@QPSK)	

Antenna Gain Specifications

	Operating Frequency	Average Gain (dBi)
Low Band	700MHz~900MHz	0.23
Middle Band	1710MHz~1880MHz	8.04
	1880~2555MHz	8.65
	2555~2690MHz	8.87
High Band	3400~3600MHz	9.12
Half power beam-width	Horizontal plane: 60°	Vertical plane: 60°

Mechanical Specifications

IP Rating	IP65
Mean Time Between Failure	300,000H

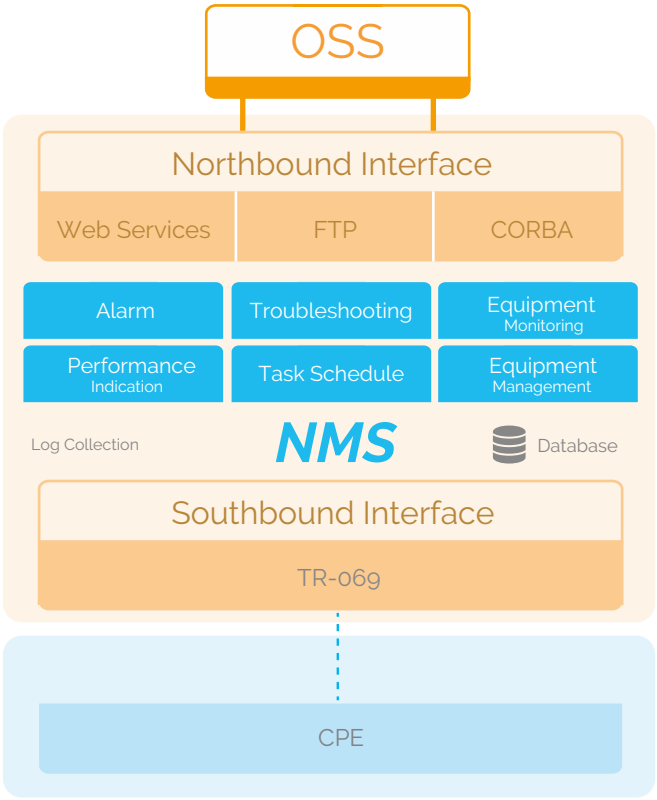
Environmental Specifications

Operating Temperature	-40~55°C
Operating Humidity	0~95%

Dimensions

Total Dimension (L x W x H, approx)	260mm x 149mm x 72mm
Weight	700g

Comba's LTE CPE's user-friendly **remote monitoring and upgrade system** is a TR-069 enabled carrier-grade NMS platform with 1+1 redundancy that allows flexibility on batch software and schedule upgrade, remote configuration parameters, real time and history alarm management.



▲ *Carrier-grade NMS platform*

LTE CPE Management

GUI-based Web Configuration

Auto Rollback to previous version when upgrade fail

Software Upgrade HTTP/FTP Auto Upgrade	Full image upgrade
	Firmware upgrade manually
	Enable / Disable Upgrade Firmware
	Upgrade URL
	Version file

Easy monitoring on remote query status

- Offline/online
- Online duration
- Cell ID
- Throughput
- Reference Signal Received Power (RSRP)
- Signal-to-interference-plus-noise ratio (SINR)

Customized mechanical design fitting for your business

- Mi-Fi
- Vehicle CPE
- Outdoor CPE
- CPE Relay

Software Features/ Support

- Language settings: English, Spanish and Portuguese
- NAT/Router mode
- HTTP or HTTPS web server
- Multi-APN
- VPN
- DNS
- Ipv6/Ipv4 dual stack
- NTP Synchronization
- PIN Management, SIM card Authentication
- Preferred band and frequency

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