

# ePMP™ Force 400 Series

## QUICK LOOK:

- **Industry's first point-to-point solution based on 802.11ax delivering up to Gbps capacity**
- **High-capacity enterprise access**
- **Low-cost WISP backhaul**
- **Wi-Fi hotspot backhaul**
- **GPON last mile**



Cambium Networks introduces the ePMP Force 425 and Force 400C point-to-point solutions which deliver up to 1 Gbps throughput at a breakthrough price point based on the latest 802.11ax standards. The Force 400 Series is the ideal solution for service providers looking to deliver high-capacity access services to enterprise and residential customers. It also serves as a low-cost backhaul for MicroPOP's and outdoor Wi-Fi access points that require lots of capacity at moderate range without the overhead of licensed microwave. With an integrated SFP port and optional GPON ONU module, the Force 425 makes a great fiber extension to reach places where fiber cannot.

The Force 425 pushes this capacity farther than ever with an integrated 25 dBi dish (and even farther with the optional 28 dBi range extender). The optional range extender is ordered separately and can be assembled and attached in the field to add additional link budget and fade margin. This is for challenging links or to move to higher capacity where needed and higher modulations can be achieved.

For even longer range applications, the Force 400C is a connectorized option with two RP-SMA RF interfaces for use with larger parabolic dishes or horn antennas.

Leveraging the latest technology from the 802.11ax standard and Cambium Networks proprietary ePTP mode, the Force 425/400C delivers high spectral efficiency with features such as 1024 QAM, 80 MHz channels, a highly efficient frame structure and the proven ePTP air interface. The Force 400 Series delivers Gbps performance with less than 5 ms latency.

The Force 400 series has enterprise-grade security with 128-bit AES over-the-air encryption (256-bit AES where export rules allow), secure management interfaces with roles-based authentication and standards-based device authentication including RADIUS support.

Force 425/400C is built for the real world with IP67 ruggedization, simplified mounting scheme and Cambium Networks' 3-year hardware warranty.

Plan and manage your Force 425/400C deployments with Cambium Networks LINKPlanner and cnMaestro.

## ePMP™ Force 400 Series

Spectrum	
	<b>Force 400C / Force 425</b>
<b>Channel Width MHz</b>	20   40   80
<b>Proprietary Physical Layer</b>	802.11ax, 2x2 MIMO/OFDM
<b>Channel Spacing</b>	Configurable in 5 MHz increments
<b>Frequency Range</b>	Wide Band Operation 4910 - 6135 MHz (Note: Country dependent based on local regulations. Support of 5870 to 6135 coming in a future software upgrade.)
<b>MAC Layer (Media Access Control)</b>	Cambium Proprietary
<b>Ethernet Interface</b>	100/1000 BaseT, Compatible with Cambium PoE & Standard PoE pinouts; 10 Gigabit SFP cage for optional SFP modules
<b>Protocols Used</b>	IPv4/IPv6 (Dual Management Stack), UDP, TCP, ICMP, SNMPv2c, NTP, STP, IGMP, SSH
<b>Network Management</b>	IPv4/IPv6, HTTPs, SNMPv2c, SSH, Cambium Networks cnMaestro™
<b>VLAN</b>	802.1Q with 802.1p priority

Performance	
	<b>Force 400C / Force 425</b>
<b>ARQ</b>	Yes
<b>Maximum Capacity</b>	1 Gbps
<b>Latency</b>	< 5 ms
<b>Nominal Receive Sensitivity (w/FEC) @20 MHz Channel</b>	MCS 0 = -93 dBm to MCS 11 (1024 QAM-5/6) = -63 dBm (per chain)
<b>Nominal Receive Sensitivity (w/FEC) @40 MHz Channel</b>	MCS 0 = -90 dBm to MCS 11 (1024 QAM-5/6) = -60 dBm (per chain)
<b>Nominal Receive Sensitivity (w/FEC) @80 MHz Channel</b>	MCS 0 = -87 dBm to MCS 11 (1024 QAM-5/6) = -57 dBm (per chain)
<b>Modulation Levels (Adaptive)</b>	MCS 0 (BPSK) to MCS 11 (1024 QAM-5/6)
<b>Transmit Power Range</b>	+3 to +28 dBm (combined, to regional EIRP limit) (1 dB interval)
<b>Maximum Distance</b>	In PTP application deployments, the maximum distance supported is 32 km (19.9 mi)

## ePMP™ Force 400 Series

Physical		
	<b>Force 400C</b>	<b>Force 425</b>
<b>Connectors</b>	1 x RJ-45, 1 x SFP, 2 x RP-SMA	1 x RJ-45, 1 x SFP
<b>Surge Supression*</b>	1 Joule Integrated	1 Joule Integrated
<b>Environmental</b>	IP67 including metal housing	IP67 including metal housing
<b>Temperature</b>	-30°C to 65°C (-22°F to 149°F)	-30°C to 65°C (-22°F to 149°F)
<b>Weight</b>	1.3 kg (2.9 lbs.)	4.8 kg (10.6 lbs.)
<b>Wind Survival</b>	180 km/h (112 mph)	180 km/hour (112 mph)
<b>Dimensions (H x W x D)</b>	256 mm x 125 mm x 46 mm (10.1 in x 4.9 in. x 1.8 in.)	470 mm diameter x 285 mm depth (18.5 in diameter x 11.2 in depth)
<b>Pole Diameter Range</b>	Center: 3.1 to 7.6 cm (1.25 to 3.0 in)	Center: 3.1 to 7.6 cm (1.25 to 3.0 in)
<b>Power Consumption</b>	28 W	28 W
<b>Input Voltage</b>	802.3at or Passive PoE 44-59 V	802.3at or Passive PoE 44-59 V
<b>Included Power Supply</b>	100-230VAC ,56V, 30W, PoE Adaptor	100-230VAC ,56V, 30W, PoE Adaptor

\*Optional 56 V Surge Suppressor Available: Part # C000000L033A

Security	
	<b>Force 400C / Force 425</b>
<b>Encryption</b>	128-bit Over-the-Air Encryption (256-bit AES where export rules allow - ROADMAP Feature)

Certifications		
	<b>Force 400C</b>	<b>Force 425</b>
<b>FCC Regulatory Part Number</b>	C058940P122A	C058940P102A
<b>FCC ID**</b>	Z8H89FT0062	Z8H89FT0062
<b>ETSI/ROW Regulatory Part Number</b>	C050940P021A	C050940P001A
<b>Industry Canada Cert**</b>	109W-0062	109W-0062
<b>CE</b>	EN 301 893 V2.11 (5.4 GHz), EN 302 502 V2.11 (5.8 GHz)**	EN 301 893 V2.11 (5.4 GHz), EN 302 502 V2.11 (5.8 GHz)**

\*\*Certifications are a place holder until official grant is given

## ePMP™ Force 400 Series

Antenna Specifications		
	Force 425	Force 425 with Range Extender
<b>Frequency Range</b>	4910 – 6135 MHz	4910 – 6135 MHz
<b>Antenna Type</b>	Dish	Optional Dish Accessory
<b>Peak Gain</b>	25 dBi	28 dBi
<b>3 dB Beamwidth Azimuth</b>	15°	TBD
<b>3 dB Beamwidth Elevation</b>	30°	TBD
<b>Front-To-Back Isolation</b>	TBD	TBD
<b>Cross Polarization</b>	TBD	TBD



Force 400C



Force 425

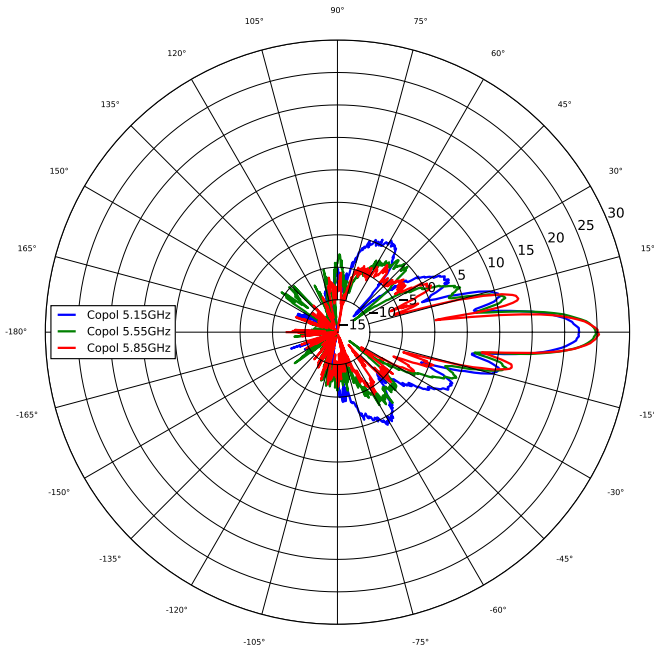


Force 425 with Range Extender

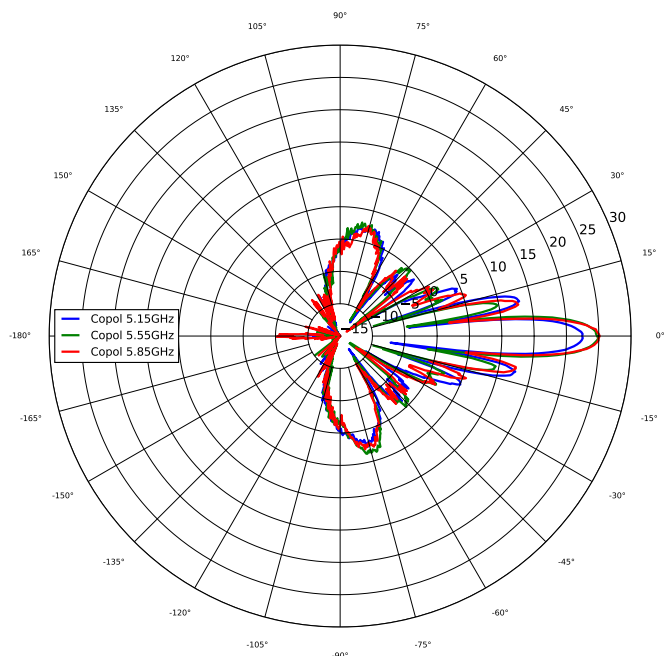
ePMP™ Force 400 Series

Force 425 Antenna Patterns

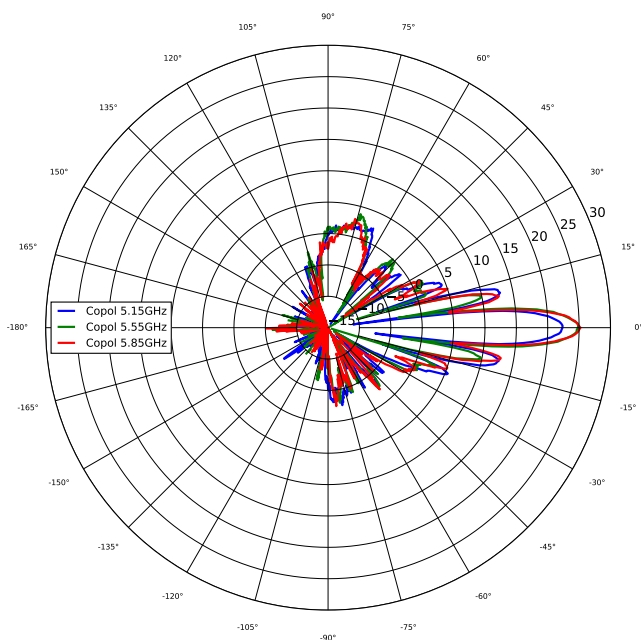
Azimuth, Horizontal



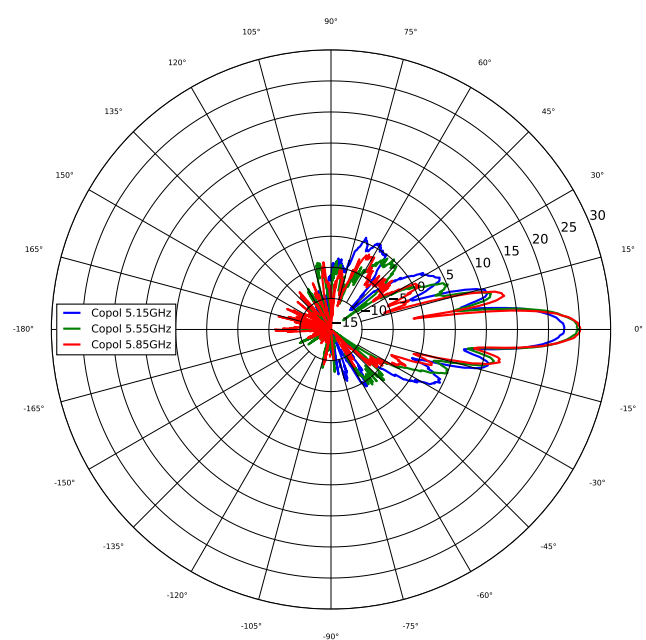
Azimuth, Vertical



Elevation, Horizontal



Elevation, Vertical



## ePMP™ Force 400 Series

### Force 400C Ordering Information

<b>C050940C021A</b>	ePMP 5 GHz Force 400C (ROW) (no cord)
<b>C050940C121A</b>	ePMP 5 GHz Force 400C (ROW) (US cord)
<b>C058940C124A</b>	ePMP 5 GHz Force 400C (IC) (Canada/US cord)
<b>C050940C221A</b>	ePMP 5 GHz Force 400C (ROW) (EU cord)
<b>C050940C223A</b>	ePMP 5 GHz Force 400C (EU) (EU cord)
<b>C050940C321A</b>	ePMP 5 GHz Force 400C (ROW) (UK cord)
<b>C050940C323A</b>	ePMP 5 GHz Force 400C (EU) (UK cord)
<b>C050940C421A</b>	ePMP 5 GHz Force 400C (ROW) (India cord)
<b>C050940C422A</b>	ePMP 5 GHz Force 400C (India) (India Cord)
<b>C050940C521A</b>	ePMP 5 GHz Force 400C (ROW) (China cord)
<b>C050940C621A</b>	ePMP 5 GHz Force 400C (ROW) (Brazil cord)
<b>C050940C721A</b>	ePMP 5 GHz Force 400C (ROW) (Argentina cord)
<b>C050940C821A</b>	ePMP 5 GHz Force 400C (ROW) (ANZ cord)
<b>C050940C921A</b>	ePMP 5 GHz Force 400C (ROW) (South Africa cord)
<b>C050940CZ21A</b>	ePMP 5 GHz Force 400C (ROW) (No PSU)
<b>C058940C122A</b>	ePMP 5 GHz Force 400C (FCC) (US Cord)

### Force 425 Ordering Information

<b>C050940M001A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (no cord) - Priced per radio
<b>C050940M101A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (US cord) - Priced per radio
<b>C058940M104A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (IC) (Canada/US cord) - Priced per radio
<b>C050940M201A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (EU cord) - Priced per radio
<b>C050940M203A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (EU) (EU cord) - Priced per radio
<b>C050940M301A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (UK cord) - Priced per radio
<b>C050940M303A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (EU) (UK cord) - Priced per radio
<b>C050940M401A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (India cord) - Priced per radio
<b>C050940M402A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (India) (India Cord) - Priced per radio
<b>C050940M501A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (China cord) - Priced per radio
<b>C050940M601A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (Brazil cord) - Priced per radio
<b>C050940M701A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (Argentina cord) - Priced per radio
<b>C050940M801A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (ANZ cord) - Priced per radio
<b>C050940M901A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (South Africa cord) - Priced per radio
<b>C050940MZ01A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (ROW) (No PSU) - Priced per radio
<b>C058940M102A</b>	ePMP 5 GHz Force 425 SM 2-pack packaging (FCC) (US Cord) - Priced per radio

## ePMP™ Force 400 Series

### Force 425 Optional Range Extenders

**N000900L062A** ePMP Force 425 Range Extender Dish Accessory 4-Pack Packaging, priced per unit

### Force 400 Series Spares Ordering Information

**C050940F001A** ePMP 5 GHz Force 425 Spare Radio Only (ROW)

**C058940F104A** ePMP 5 GHz Force 425 Spare Radio Only (IC)

**C050940F203A** ePMP 5 GHz Force 425 Spare Radio Only (EU)

**C050940F402A** ePMP 5 GHz Force 425 Spare Radio Only (India)

**C058940F102A** ePMP 5 GHz Force 425 Spare Radio Only (FCC)

**C050940M100A** ePMP 5 GHz Force 425 Spare Dish 2-Pack, priced per unit

**N000900L061A** ePMP Force 400 Spares Kit

### Extended Warranty Options

**Each Force 400 Series radio comes standard with 3-year warranty on hardware.**

**EW-E1EPF400-WW** ePMP Force 400 Extended Warranty, 1 Additional Year

**EW-E2EPF400-WW** ePMP Force 400 Extended Warranty, 2 Additional Years

**EW-E1EPF425-WW** ePMP Force 425 Extended Warranty, 1 Additional Year

**EW-E2EPF425-WW** ePMP Force 425 Extended Warranty, 2 Additional Years

### ABOUT CAMBIUM NETWORKS

Cambium Networks empowers millions of people with wireless connectivity worldwide. Its wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.