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**





cnMaestro READY

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.

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ePMP™ Force 400 Series

Spectrum

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

Performance

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

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ePMP™ Force 400 Series

Physical

	Force 400C	Force 425
Connectors	1 x RJ-45, 1 x SFP, 2 x RP-SMA	1 x RJ-45, 1 x SFP
Surge Supression*	1 Joule Integrated	1 Joule Integrated
Environmental	IP67 including metal housing	IP67 including metal housing
Temperature	-30°C to 65°C (-22°F to 149°F)	-30°C to 65°C (-22°F to 149°F)
Weight	1.3 kg (2.9 lbs.)	4.8 kg (10.6 lbs.)
Wind Survival	180 km/h (112 mph)	180 km/hour (112 mph)
Dimensions (H x W x D)	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)
Pole Diameter Range	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)
Power Consumption	28 W	28 W
Input Voltage	802.3at or Passive PoE 44-59 V	802.3at or Passive PoE 44-59 V
Included Power Supply	100-230VAC ,56V, 30W, PoE Adaptor	100-230VAC ,56V, 30W, PoE Adaptor

*Optional 56 V Surge Suppressor Available: Part # C000000L033A

Security

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

Certifications

	Force 400C	Force 425
FCC Regulatory Part Number	C058940P122A	C058940P102A
FCC ID**	Z8H89FT0062	Z8H89FT0062
ETSI/ROW Regulatory Part Number	C050940P021A	C050940P001A
Industry Canada Cert**	109W-0062	109W-0062
CE	EN 301 893 V2.1.1 (5.4 GHz), EN 302 502 V2.1.1 (5.8 GHz)**	EN 301 893 V2.1.1 (5.4 GHz), EN 302 502 V2.1.1 (5.8 GHz)**

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

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ePMP™ Force 400 Series

Antenna Specifications

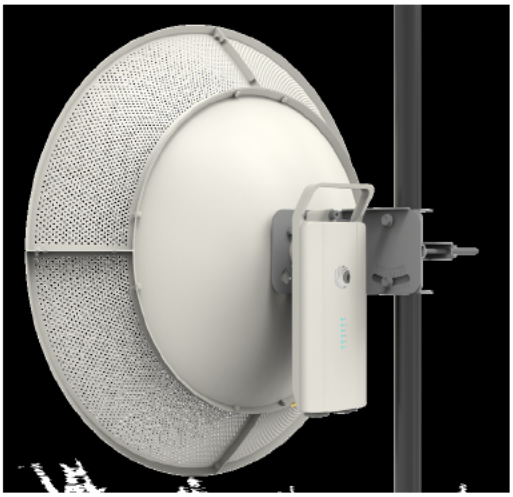
	Force 425	Force 425 with Range Extender
Frequency Range	4910 – 6135 MHz	4910 – 6135 MHz
Antenna Type	Dish	Optional Dish Accessory
Peak Gain	25 dBi	28 dBi
3 dB Beamwidth Azimuth	15°	TBD
3 dB Beamwidth Elevation	30°	TBD
Front-To-Back Isolation	TBD	TBD
Cross Polarization	TBD	TBD



Force 400C



Force 425

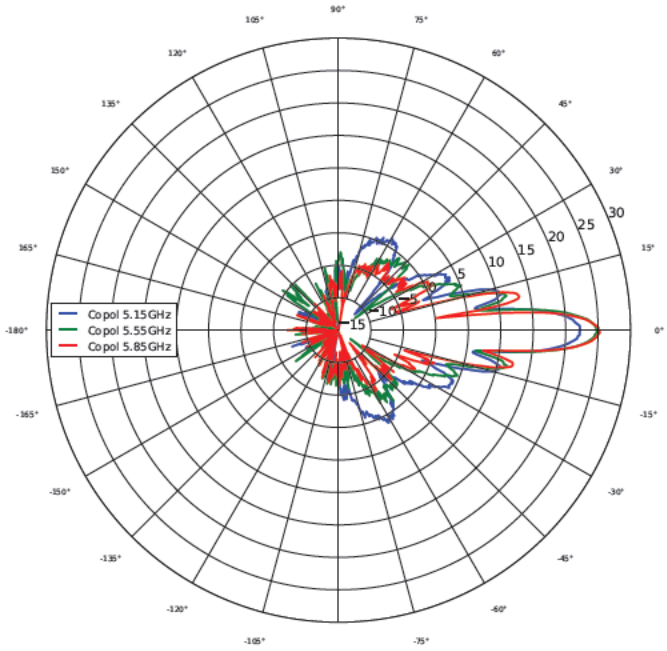


Force 425 with Range Extender

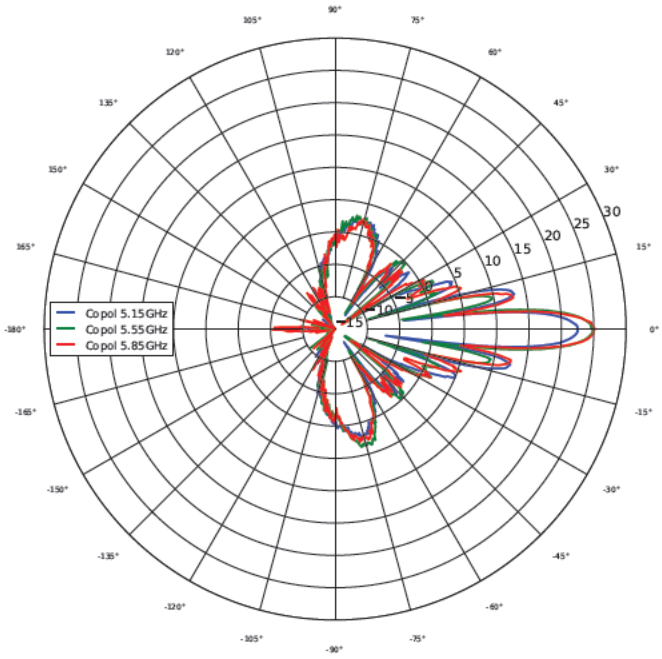
ePMP™ Force 400 Series

Force 425 Antenna Patterns

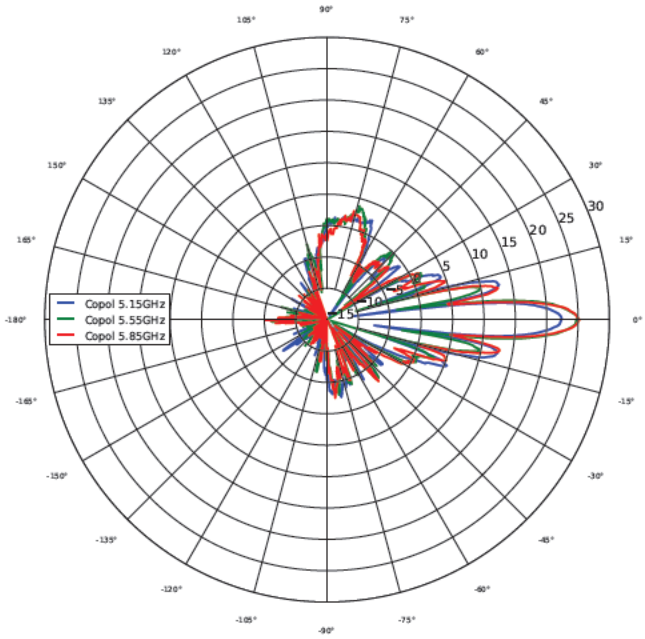
Azimuth, Horizontal



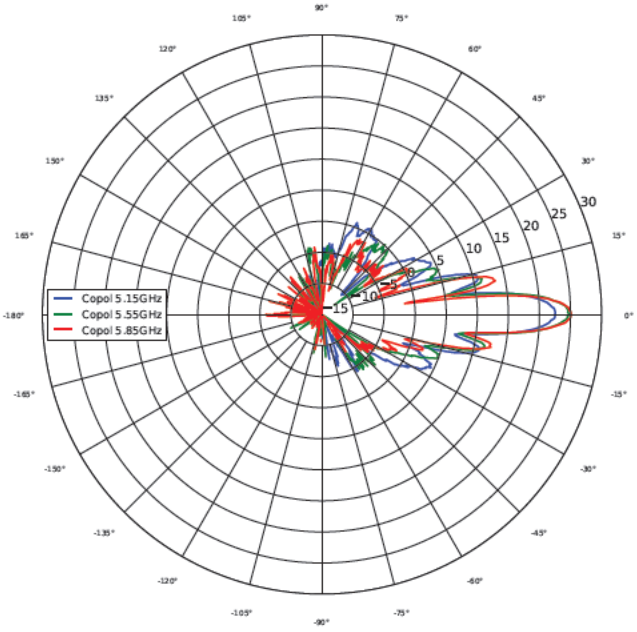
Azimuth, Vertical



Elevation, Horizontal



Elevation, Vertical



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ePMP™ Force 400 Series

Force 400C Ordering Information

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

Force 425 Ordering Information

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

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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

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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.

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