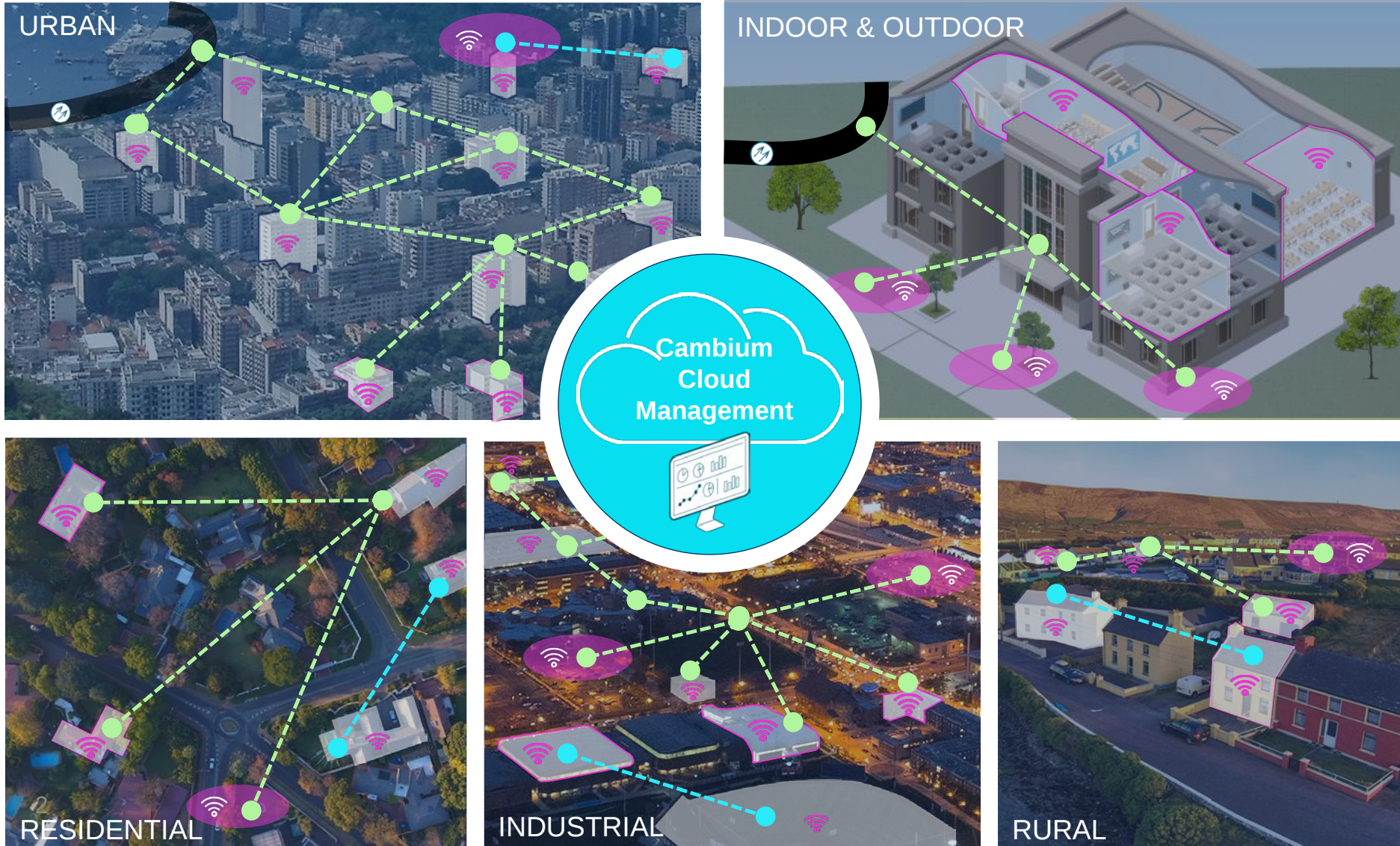




**Cambium Networks™**

**Multi-Gigabit Wireless  
That Just Works**  
October 2020

# Cambium Networks Multi-Gigabit Wireless Fabric



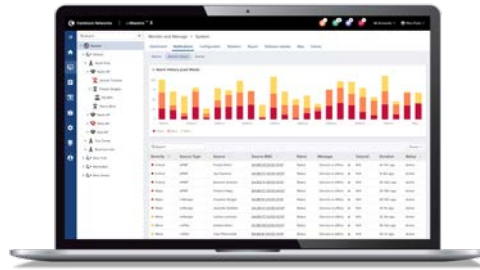
Multi-Gig Wireless from  
Broadband to the Edge

Proven Lowest Cost  
per Mbps

One Dashboard for Wi-Fi,  
Switching and Broadband

-  Fixed Wireless 60 GHz Distribution
-  Fixed Wireless 60 GHz PTP
-  Wi-Fi
-  Fiber Ring

# Breakthrough Applications



## cnMaestro™

- Cloud management
- Secure, end-to-end control for the wireless fabric



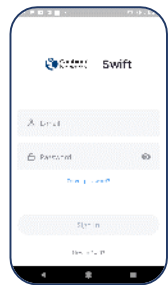
## XMS & EasyPass

- Cloud & on-premise management
- Simple, scalable, secure
- EasyPass access control



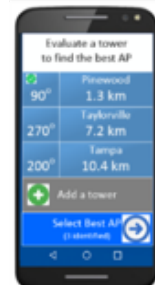
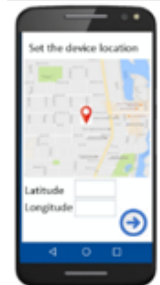
## LINKPlanner

- Free, network design tool for RF environments
- Tens of thousands of links deployed



## Swift

- Cloud-based management of your enterprise networks right from your phone



## cnArcher™

- Free Android™ app
- Allows field techs to configure PMP networks



## cnHeat

- Quickly pre-qualify customers
- Identify and market to new customers
- Optimize greenfield site placement



## Wi-Fi Designer

- Free online Wi-Fi design tool
- Place APs, visualize coverage and generate BOM

## Point-to-Point



### PTP 820

- Licensed microwave



### PTP 670

- Sub-6 GHz
- Multi-band flexibility
- Channel sizes 5 MHz to 45 MHz

## Point-to-Multipoint



### LTE

- Fixed LTE
- Integrated RAN and EPC
- 2.4 GHz & 3 GHz



### 60 GHz cnWave

- Multi-gigabit throughput
- 60 GHz band
- Software-defined radio



### PMP 450M

- 14x14 cnMedusa™ Massive MU-MIMO
- 3 GHz & 5 GHz
- Will drive continued PMP growth for next several years



### ePMP™ 3000

- 4x4 cnMedusa MU-MIMO & 80 MHz channel support
- Higher capacity & spectral efficiency

## Wi-Fi



### XV Series

- High-performance Wi-Fi 6
- Application intelligence
- Cloud-managed



### cnPilot™ E Series

- Indoor & outdoor
- Cloud-savvy
- Economically priced



### Xirrus X Series

- High-density architecture
- Application intelligence
- Cloud managed

## IIoT



### cnReach™ N500

- IIoT narrowband connectivity
- Licensed & unlicensed spectrum

## Switches



### cnMatrix™ EX2000 Series

- High-performance L3
- 10, 16, 24 & 52 port PoE+ models
- Multi-GigE support for Wi-Fi 6



### cnMatrix EX1000 Series

- Value priced
- 10 & 28 port models
- Up to 56 Gbps

## Video Surveillance



### cnVision Hub-FLEXr

- 4.9 GHz to 5.9 GHz
- 600 Mbps throughput
- IP 67
- ONVIF
- Genetec VMS

# PTP 820 Licensed Microwave – Full Outdoor

|                                |  |  |  |  |  |
|--------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                | PTP 820S                                                                          | PTP 820C                                                                            | PTP 820C High Power                                                                 | PTP 820E                                                                            | PTP 850E                                                                            |
| Frequency Band (GHz)           | 6–38 GHz                                                                          | 6–38 GHz                                                                            | 6–11 GHz                                                                            | 71–76 GHz, 81–86 GHz                                                                | 71–76 GHz, 81–86 GHz                                                                |
| Channel Size                   | 3.5–80 MHz                                                                        | 3.5–80 MHz                                                                          | 3.5–80 MHz                                                                          | 62.5, 125, 250, 500 MHz                                                             | 250, 500, 1000, 2000 MHz                                                            |
| Number of Carriers             | Single                                                                            | Dual                                                                                | Dual                                                                                | Single                                                                              | Single                                                                              |
| Maximum Tx Power               | 29 dBm                                                                            | 28 dBm                                                                              | 35 dBm                                                                              | 18                                                                                  | 18                                                                                  |
| XPIC                           | Not Supported                                                                     | Supported                                                                           | Supported                                                                           | Not Supported                                                                       | Not Supported                                                                       |
| MIMO                           | Not Supported                                                                     | 2x2 / 4x4 MIMO                                                                      | 2x2 / 4x4 MIMO                                                                      | Not Supported                                                                       | Not Supported                                                                       |
| Traffic Interface              | 1 x 10/100/1000 BaseT (RJ-45)                                                     | 1 x 10/100/1000 BaseT (RJ-45)                                                       | 1 x 10/100/1000 BaseT (RJ-45)                                                       | 1 x 10/100/1000 BaseT (RJ-45)                                                       | 1 x 10/100/1000 BaseT (RJ-45)                                                       |
|                                | 2 x 1000 BaseX - SFP                                                              | 2 x 1000 BaseX - SFP                                                                | 1 x 1000 BaseX - SFP                                                                | 1 x 1000 BaseX - SFP<br>1 x 10Gb SFP+                                               | Up to 5 x 10Gb SFP+<br>1 x 40Gb QSFP+                                               |
| MTU                            | 9600 Bytes                                                                        | 9600 Bytes                                                                          | 9600 Bytes                                                                          | 9600 Bytes                                                                          | 9612 Bytes                                                                          |
| QoS                            | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP                                    | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP                                      | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP                                      | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP                                      | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP                                      |
|                                | 8 priority queues                                                                 | 8 priority queues                                                                   | 8 priority queues                                                                   | 8 priority queues                                                                   | 8 priority queues                                                                   |
|                                | Configurable up to 64 Mbit per queue                                              | Configurable up to 64 Mbit per queue                                                | Configurable up to 64 Mbit per queue                                                | Configurable up to 64 Mbit per queue                                                | Configurable up to 64 Mbit per queue                                                |
| Configuration                  | 1+0                                                                               | 1+0 to 4+0                                                                          | 1+0 to 4+0                                                                          | 1+0                                                                                 | 1+0                                                                                 |
|                                | 1+1 HSB                                                                           | 1+1/2+2 HSB                                                                         | 1+1/2+2 HSB                                                                         |                                                                                     |                                                                                     |
|                                | 2+0, Non-XPIC                                                                     | 2+0 XPIC                                                                            | 2+0 XPIC                                                                            | 2+0, Non-XPIC                                                                       | 2+0, Non-XPIC                                                                       |
|                                |                                                                                   | 2+2 SD                                                                              | 2+2 SD                                                                              |                                                                                     |                                                                                     |
| Performance (Layer 2)          | 596 Mbps – No compression                                                         | 1.2 Gbps – No compression                                                           | 1.2 Gbps – No compression                                                           | 2416 Mbps – No compression                                                          | 10 Gbps – No compression                                                            |
|                                | 833 – Multi-layer compression                                                     | 2 Gbps – Multi-layer compression                                                    | 2 Gbps – Multi-layer compression                                                    | 2.5 Gbps – Multi-layer compression                                                  | 10 Gbps – Multi-layer compression                                                   |
| Modulation                     | QPSK to 2048 QAM w/ACM                                                            | QPSK to 2048 QAM w/ACM                                                              | QPSK to 2048 QAM w/ACM                                                              | QPSK to 1024 QAM w/ACM                                                              | QPSK to 512 QAM w/ACM                                                               |
| Multi-Carrier Link Aggregation | N/A                                                                               | MC-ABC                                                                              | MC-ABC                                                                              | N/A                                                                                 | N/A                                                                                 |
| Power Consumption              | 6–11 GHz: 40W                                                                     | 6 & 11 GHz: 65W                                                                     | 1+0 operation: 81W                                                                  | 43 W                                                                                | 58 W                                                                                |
|                                |                                                                                   | 7 GHz: 75W                                                                          |                                                                                     |                                                                                     |                                                                                     |
|                                | 13–38 GHz: 35W                                                                    | 13–15 GHz & 26–38 GHz: 55W<br>18–24 GHz: 48W                                        | Multi-core operation: 135W                                                          |                                                                                     |                                                                                     |

# PTP 820 Licensed Microwave – Split Mount

|                                |                                                    |                                   |                          |                          |                          |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|                                | PTP 820G + RFU-C                                                                                                                    | PTP 820G + RFU-A                                                                                                    | PTP 820F + RFU-S/RFU-D                                                                                      | PTP 820F + RFU-D High Power                                                                                 | PTP 820F + RFU-E                                                                                            |
| Frequency Band (GHz)           | 6–38 GHz                                                                                                                            | 6, 11 GHz                                                                                                           | 6–38 GHz                                                                                                    | 6–11 GHz                                                                                                    | 71–76 GHz, 81–86 GHz                                                                                        |
| Channel Size                   | 3.5–60 MHz                                                                                                                          | 3.5–60 MHz                                                                                                          | 14–112 MHz                                                                                                  | 14–112 MHz                                                                                                  | 62.5, 125, 250, 500 MHz                                                                                     |
| Number of Carriers             | Single & Dual                                                                                                                       | Single & Dual                                                                                                       | Up to 5 carriers                                                                                            | Up to 5 carriers                                                                                            | Up to 5 carriers                                                                                            |
| Maximum Tx Power               | 26 dBm                                                                                                                              | 35 dBm                                                                                                              | 28 dBm                                                                                                      | 38 dBm                                                                                                      | 18 dBm                                                                                                      |
| XPIC                           | Supported                                                                                                                           | Supported                                                                                                           | Supported                                                                                                   | Supported                                                                                                   | Not Supported                                                                                               |
| MIMO                           | Not Supported                                                                                                                       | Not Supported                                                                                                       | Available in future roadmap                                                                                 | Available in future roadmap                                                                                 | Not Supported                                                                                               |
| Traffic Interface              | 4 x 10/100/1000 BaseT (RJ-45)                                                                                                       | 4 x 10/100/1000 BaseT (RJ-45)                                                                                       | 4 x 1 GbE combo interface (RJ-45/SFP)<br>1 x 2.5/1 Gbps combo interface (RJ-45/SFP)*                        | 4 x 1 GbE combo interface (RJ-45/SFP)<br>1 x 2.5/1 Gbps combo interface (RJ-45/SFP)*                        | 4 x 1 GbE combo interface (RJ-45/SFP)<br>1 x 2.5/1 Gbps combo interface (RJ-45/SFP)*                        |
| MTU                            | 2 x 1000 BaseX - SFP<br>9600 Bytes                                                                                                  | 2 x 1000 BaseX - SFP<br>9600 Bytes                                                                                  | 9600 Bytes                                                                                                  | 9600 Bytes                                                                                                  | 9600 Bytes                                                                                                  |
| QoS                            | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP<br>8 priority queues<br>Configurable up to 64 Mbit per queue                         | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP<br>8 priority queues<br>Configurable up to 64 Mbit per queue         | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP<br>8 priority queues<br>Configurable up to 64 Mbit per queue | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP<br>8 priority queues<br>Configurable up to 64 Mbit per queue | VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP<br>8 priority queues<br>Configurable up to 64 Mbit per queue |
| Configuration                  | 1+0 to 2+0<br>1+1/2+2 HSB<br>2+0 XPIC<br>1+1 HSB with SD                                                                            | 1+0 to 2+0<br>1+1/2+2 HSB<br>2+0 XPIC<br>1+1 HSB with SD                                                            | 1+0, 3 x 1+0, 2 x 2+0, 2 x 2+0 + 1+0<br>1+1/2+2 HSB *<br>2 x 2+0 XPIC                                       | 1+0, 3 x 1+0, 2 x 2+0, 2 x 2+0 + 1+0<br>1+1/2+2 HSB *<br>2 x 2+0 XPIC                                       | 1+0, 3 x 1+0, 2 x 2+0, 2 x 2+0 + 1+0<br>1+1/2+2 HSB *<br>2 x 2+0 XPIC                                       |
| Performance (Layer 2)          | 1 Gbps – No compression<br>2 Gbps – Multi-layer compression                                                                         | 1 Gbps – No compression<br>2 Gbps – Multi-layer compression                                                         | 2.5 Gbps – No compression                                                                                   | 2.5 Gbps – No compression                                                                                   | 2.5 Gbps – No compression                                                                                   |
| Modulation                     | QPSK to 2048 QAM w/ACM                                                                                                              | QPSK to 2048 QAM w/ACM                                                                                              | QPSK to 4096 QAM w/ACM                                                                                      | QPSK to 4096 QAM w/ACM                                                                                      | QPSK to 4096 QAM w/ACM                                                                                      |
| Multi Carrier Link Aggregation | MC-ABC                                                                                                                              | MC-ABC                                                                                                              | MC-ABC                                                                                                      | MC-ABC                                                                                                      | MC-ABC                                                                                                      |
| Power Consumption              | IDU: 23.5W(single modem)<br>IDU: 26.4W(Dual modem)<br>RFU-C 6–26 GHz: 22W (1+0), 39W (1+1)<br>RFU-C 28–38 GHz: 26W (1+0), 43W (1+1) | IDU: 23.5W(single modem)<br>IDU: 26.4W(Dual modem)<br>RFU-Ae: 77W (1+0), 101W(1+1)<br>RFU-Aep: 90W (1+0), 114W(1+1) | IDU: 48 W<br>RFU-S: 43W<br>RFU-D: 75W                                                                       | IDU: 48 W<br>RFU-D-HP: 130W (1+0)<br>RFU-D-HP: 180W (2+0)                                                   | 43                                                                                                          |

# PTP Sub-6 GHz

|                                | Bridge-in-a-Box                                                                   | Force 200                                                                         | Force 300                                                                          | PTP 550                                                                             | PTP 550E                                                                            | PTP 450                                                                             | PTP 450i                                                                            | PTP 670                                                                             | PTP 700                                                                             |
|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                |  |  |  |  |  |  |  |  |  |
| <b>Technology</b>              | 802.11ac / 802.11ac                                                               | 802.11n                                                                           | 802.11ac Wave 2                                                                    | 802.11ac Wave 2                                                                     | 802.11ac Wave 2                                                                     | Proprietary                                                                         | Proprietary                                                                         | Proprietary                                                                         | Proprietary                                                                         |
| <b>Max Throughput</b>          | 200//600Mbps                                                                      | 200 Mbps                                                                          | 600 Mbps                                                                           | 1.4 Gbps                                                                            | 1.4 Gbps                                                                            | 300 Mbps                                                                            | 300 Mbps                                                                            | 450 Mbps                                                                            | 450 Mbps                                                                            |
| <b>Frequency Range (GHz)</b>   | 4.9–5.97                                                                          | 2.4–2.47<br>4.9–5.97                                                              | 5.15–5.97                                                                          | 5.15–5.97                                                                           | 4.9–6.2                                                                             | 3.3–3.6<br>3.55–3.8<br>5.4–5.8                                                      | 4.9–5.925                                                                           | 4.9–6.05                                                                            | 4.4–5.9                                                                             |
| <b>Line of Sight</b>           | LoS                                                                               | LoS                                                                               | LoS                                                                                | LoS                                                                                 | LoS                                                                                 | LoS                                                                                 | LoS                                                                                 | LoS, nLoS, NLoS                                                                     | LoS, nLoS, NLoS                                                                     |
| <b>Channel BW (MHz)</b>        | 5/10/20/40                                                                        | 5/10/20/40                                                                        | 20/40/80                                                                           | 2x 20/40/80                                                                         | 2x 20/40/80                                                                         | 5/10/20/30/40                                                                       | 5/10/15/20/30/40                                                                    | 5/10/15/20/30/40/45                                                                 | 5/10/15/20/30/40/45                                                                 |
| <b>Latency</b>                 | 2–3 ms                                                                            | 2–3 ms                                                                            | 3–6 ms                                                                             | 3–5 ms                                                                              | 3–5 ms                                                                              | 3–5 ms                                                                              | 3–5 ms                                                                              | 1–3 ms                                                                              | 1–3 ms                                                                              |
| <b>Tx Power</b>                | 30 dBm                                                                            | 30 dBm                                                                            | 27 dBm                                                                             | 27 dBm                                                                              | 27 dBm                                                                              | 22 dBm                                                                              | 27 dBm                                                                              | 27 dBm                                                                              | 27 dBm                                                                              |
| <b>Top Modulation</b>          | 256 QAM                                                                           | 64 QAM                                                                            | 256 QAM                                                                            | 256 QAM                                                                             | 256 QAM                                                                             | 256 QAM                                                                             | 256 QAM                                                                             | 256 QAM                                                                             | 256 QAM                                                                             |
| <b>Max Frame Size</b>          | 1700 Bytes                                                                        | 1700 Bytes                                                                        | 1700 Bytes                                                                         | 1700 Bytes                                                                          | 1700 Bytes                                                                          | 1700 Bytes                                                                          | 1700 Bytes                                                                          | 9600 Bytes                                                                          | 9600 Bytes                                                                          |
| <b>Spectrum Management</b>     | Standby Spectrum Analyzer                                                         | Standby Spectrum Analyzer                                                         | Live Spectrum Analyzer                                                             | Dynamic Channel Selection                                                           | Dynamic Channel Selection                                                           | Standby Spectrum Analyzer                                                           | Standby Spectrum Analyzer                                                           | Dynamic Spectrum Optimization (DSO)                                                 | Dynamic Spectrum Optimization (DSO)                                                 |
| <b>Dynamic Filter</b>          | No                                                                                | No                                                                                | No                                                                                 | No                                                                                  | No                                                                                  | No                                                                                  | Yes                                                                                 | No                                                                                  | Yes                                                                                 |
| <b>IEEE 1588v2 &amp; SyncE</b> | No                                                                                | No                                                                                | No                                                                                 | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | Yes                                                                                 | Yes                                                                                 |
| <b>TDD Sync</b>                | No                                                                                | No                                                                                | No                                                                                 | Yes                                                                                 | Yes                                                                                 | Yes                                                                                 | Yes                                                                                 | Yes                                                                                 | Yes                                                                                 |
| <b>IP Rating</b>               | IP55/67                                                                           | IP55                                                                              | IP55                                                                               | IP66/67                                                                             | IP66/67                                                                             | IP 66/67                                                                            | IP66/67                                                                             | IP66/67                                                                             | IP66/67                                                                             |
| <b>Encryption</b>              | AES 128                                                                           | AES 128                                                                           | AES 128                                                                            | AES 128                                                                             | AES 128                                                                             | AES 128                                                                             | AES 128                                                                             | AES 128/AES 256                                                                     | AES 128/AES 256                                                                     |
| <b>QOS</b>                     | 3 Level                                                                           | 3 Level                                                                           | 3 Level                                                                            | 3 Level                                                                             | 3 Level                                                                             | 2 Level                                                                             | 4 Level*                                                                            | 8 Levels                                                                            | 8 Levels                                                                            |
| <b>Integrated Antenna</b>      | 13/16/19 dBi                                                                      | 16 dBi                                                                            | 25 dBi or 16 dBi                                                                   | 23 dBi                                                                              | 23 dBi                                                                              | 14 dBi                                                                              | 23 dBi                                                                              | 23 dBi                                                                              | 23 dBi                                                                              |
| <b>Power Consumption</b>       | 7W                                                                                | 7W                                                                                | 12 W                                                                               | <25 W                                                                               | <25 W                                                                               | 12 W                                                                                | <25 W                                                                               | <30 W                                                                               | <30 W                                                                               |

# PMP 450 Portfolio

## Access Points



## PMP 450i 900 MHz



## Subscriber Modules



### Access Points

### Subscriber Modules

|                   | 450M cnMedusa™                                                                   | 450I                                                                                                | 450                                                        | 450b                                                                        | 450I                                                      | 450                                                                             |
|-------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------|
| Frequency Bands   | 3 GHz, 5 GHz                                                                     | 900 MHz, 3 GHz, 5 GHz                                                                               | 2.4 GHz                                                    | 3 GHz, 5 GHz                                                                | 3 GHz, 5 GHz                                              | 900 MHz, 2.4 GHz                                                                |
| Channel Size      | 5 7 10 15 20 30 40 MHz                                                           | 5 7 10 15 20 30 40 MHz                                                                              | 5 10 15 20 30 40 MHz                                       | 5 7 10 15 20 30 40 MHz                                                      | 5 7 10 15 20 30 40 MHz                                    | 5 7 10 15 20 30 40 MHz                                                          |
| Physical Layer    | 14 x 14 MU-MIMO / OFDM                                                           | 2 x 2 MIMO / OFDM                                                                                   | 2 x 2 MIMO / OFDM                                          | 2 x 2 MIMO / OFDM                                                           | 2 x 2 MIMO / OFDM                                         | 2 x 2 MIMO / OFDM                                                               |
| Interface         | Gigabit, SFP<br>2 <sup>nd</sup> Ethernet port PoE out                            | Gigabit<br>2 <sup>nd</sup> Ethernet port PoE out                                                    | 100 Mbit                                                   | Gigabit                                                                     | Gigabit<br>2 <sup>nd</sup> Ethernet port PoE out          | 100 Mbit                                                                        |
| Environmental     | IP 67, IP 66                                                                     | IP 67, IP 66                                                                                        | IP 67, IP 66                                               | IP 55 (Mid-gain),<br>IP 67 (High Gain)                                      | IP 67, IP 66                                              | IP 55                                                                           |
| Latency           | 7–10 ms                                                                          | 3–5 ms                                                                                              | 3–5 ms                                                     | 3–5 ms                                                                      | 3–5 ms                                                    | 3–5 ms                                                                          |
| Performance       | 1.2+ Gbps                                                                        | 300+ Mbps                                                                                           | 200+ Mbps                                                  | 300+ Mbps                                                                   | 300+ Mbps                                                 | 100+ Mbps                                                                       |
| Powering Methods  | 40–60 V PoE<br>Cambium proprietary<br>PoE pinout                                 | 48–59 V PoE<br>802.3at compatible                                                                   | 30V PoE<br>Cambium proprietary<br>PoE pinout               | 30V PoE<br>Cambium proprietary<br>PoE pinout                                | 48–59 V PoE<br>802.3at compatible                         | 30V PoE<br>Cambium proprietary<br>PoE pinout                                    |
| Power Consumption | 85 W Max, 70 W Typical                                                           | 19 W Max, 16 W Typical                                                                              | 15 W max, 12 W Typical                                     | 12 W max, 9 W Typical                                                       | 19 W max, 16 W Typical                                    | 12 W max, 9 W Typical                                                           |
| Max Power         | +42 dBm EIRP                                                                     | +44 dBm EIRP<br>+27 dBm Tx power                                                                    | +22 dBm Tx power                                           | +44 dBm EIRP (mid-gain)<br>+51 dBm EIRP (high gain)                         | +50 dBm EIRP<br>+27 dBm Tx power                          | +22 dBm Tx power                                                                |
| Antenna           | 90°/120° Sector<br>14 x 14 MU-MIMO<br>Downlink beamforming<br>Uplink beamforming | 90°/120° Sector: 17 dBi<br>(3 and 5 GHz)<br>Connectorized, external 60° sector<br>antenna (900 MHz) | Connectorized,<br>external 60°<br>Sector antenna available | 17 dBi: Mid-gain<br>24 dBi: High gain (5 GHz)<br>19 dBi: High gain (3 GHz)* | 23 dBi (5 GHz)<br>19 dBi (3 GHz)<br>Integrated flat panel | 9 dBi: Integrated (2.4 GHz)<br>Connectorized, external<br>12 dBi Yagi (900 MHz) |

SMs Supported Per Sector

238

238

238

# Cambium CBRS Solutions – PMP 450

## Customers Can Choose SAS Partner

Federated Wireless

Google

CommScope



3 GHz 450M



3 GHz 450i



3 GHz 450i  
Connectorized



3 GHz 450B  
High Gain



450i  
Integrated



450i  
Connectorized

## Access Points

## Subscriber Modules

|                          | 3 GHz 450M cnMedusa™                                                           | 450i                                                   | 450b                                         | 450i                                                        |
|--------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| Frequency Bands          | 3 GHz                                                                          | 3 GHz                                                  | 3 GHz                                        | 3 GHz                                                       |
| Channel Size             | 5 7 10 15 20 30 40 MHz                                                         | 5 7 10 15 20 30 40 MHz                                 | 5 7 10 15 20 30 40 MHz                       | 5 7 10 15 20 30 40 MHz                                      |
| Physical Layer           | 8 x 8 MU-MIMO / OFDM                                                           | 2 x 2 MIMO / OFDM                                      | 2 x 2 MIMO / OFDM                            | 2 x 2 MIMO / OFDM                                           |
| Interface                | Gigabit, SFP<br>2 <sup>nd</sup> Ethernet port PoE out                          | Gigabit<br>2 <sup>nd</sup> Ethernet port PoE out       | Gigabit                                      | Gigabit<br>2 <sup>nd</sup> Ethernet port PoE out            |
| Environmental            | IP 67, IP 66                                                                   | IP 67, IP 66                                           | IP 55 (High Gain)                            | IP 67, IP 66                                                |
| Latency                  | 7–10 ms                                                                        | 3–5 ms                                                 | 3–5 ms                                       | 3–5 ms                                                      |
| Performance              | 750+ Mbps                                                                      | 300+ Mbps                                              | 300+ Mbps                                    | 300+ Mbps                                                   |
| Powering Methods         | 40–60 V PoE<br>Cambium proprietary<br>PoE pinout                               | 48–59 V PoE<br>802.3at compatible                      | 30V PoE<br>Cambium proprietary<br>PoE pinout | 48–59 V PoE<br>802.3at compatible                           |
| Power Consumption        | 150 W Max, 140 W typical                                                       | 19 W Max, 16 W typical                                 | 12 W max, 9 W typical                        | 19 W max, 16 W typical                                      |
| Max Power                | +52 dBm EIRP                                                                   | +43 dBm EIRP<br>+26 dBm Tx power                       | +51 dBm EIRP (high gain)                     | +45 dBm EIRP<br>+26 dBm Tx power                            |
| Antenna                  | 90°/120° Sector<br>8 x 8 MU-MIMO<br>Downlink beamforming<br>Uplink beamforming | 90°/120° Sector: 17 dBi<br>(3 GHz)<br>Or connectorized | 20 dBi: High gain (3 GHz)                    | 19 dBi (3 GHz)<br>Integrated flat panel<br>Or connectorized |
| SMS Supported Per Sector | 238                                                                            | 238                                                    |                                              |                                                             |



|                     |                            |
|---------------------|----------------------------|
|                     | <b>800 BBU</b><br>8TX, 8RX |
| RRH                 | 3 max                      |
| Subscriber Units    | 192                        |
| Integrated EPC, GPS | Yes                        |
| Carrier Aggregation | Yes                        |
|                     | <b>1588v2</b>              |
| Rack Mount          | 19"                        |



|                 |                               |                               |
|-----------------|-------------------------------|-------------------------------|
|                 | <b>220 RRH</b>                | <b>101 SM</b>                 |
| Frequency Bands | LTE 38, 40, 41<br>2.3–2.7 GHz | LTE 38, 40, 41<br>2.3–2.7 GHz |
| Antenna         | 16 dBi                        | 14 dBi integrated             |
| Power           | 2W per port                   | 26 dBm power                  |
| Environmental   | IP 67, IP 66                  | IP 55                         |



|                               | V5000                                                                                       | V3000                                                                                       | V1000                                        |
|-------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Frequency Range</b>        | 57–66 GHz                                                                                   | 57–66 GHz                                                                                   | 57–66 GHz                                    |
| <b>Channel Width</b>          | 2.16 GHz, 4.32 GHz*                                                                         | 2.16 GHz, 4.32 GHz*                                                                         | 2.16 GHz, 4.32 GHz*                          |
| <b>Carrier Bonding*</b>       | Up to 2 adjacent channels                                                                   | Up to 2 adjacent channels                                                                   | Up to 2 adjacent channels                    |
| <b>Mode of Operation</b>      | PMP or Mesh, PTP                                                                            | PMP or Mesh, PTP                                                                            | PMP or Mesh, PTP                             |
| <b>Technology</b>             | 802.11ay based with Terragraph certification                                                | 802.11ay based with Terragraph certification                                                | 802.11ay based with Terragraph certification |
| <b>Latency</b>                | <1 ms                                                                                       | <1 ms                                                                                       | <1 ms                                        |
| <b>Precision Timing</b>       | 1588 TC*                                                                                    | 1588 TC*                                                                                    | 1588 TC*                                     |
| <b>Maximum EIRP</b>           | 38 dBm                                                                                      | 60.5 dBm                                                                                    | 38 dBm                                       |
| <b>Antenna Gain</b>           | 22.5 dBi                                                                                    | 44.5 dBi                                                                                    | 22.5 dBi                                     |
| <b>Beamforming Scan Range</b> | +/- 140 azimuth, +/- 20 elevation                                                           | +/- 2 azimuth, +/- 1 elevation                                                              | +/- 40 azimuth, +/- 20 elevation             |
| <b>Encryption</b>             | 128-bit AES                                                                                 | 128-bit AES                                                                                 | 128-bit AES                                  |
| <b>Ethernet Interface</b>     | 1 x 100/1000/10G BaseT with PoE in,<br>1 x 100/1000 BaseT with 802.3at PoE out,<br>1 x SFP+ | 1 x 100/1000/10G BaseT with PoE in,<br>1 x 100/1000 BaseT with 802.3at PoE out,<br>1 x SFP+ | 1 x 100/1000 BaseT with PoE in               |
| <b>Environmental</b>          | IP66/67                                                                                     | IP66/67                                                                                     | IP66/67                                      |
| <b>Power Consumption</b>      | 60 W with AUX PoE out in use,<br>35 W without AUX PoE out in use                            | 55 W with AUX PoE out in use,<br>30 W without AUX PoE out in use                            | 10 W                                         |
| <b>Temperature</b>            | -40 to +60C (-40F to +140F)                                                                 | -40 to +60C (-40F to +140F)                                                                 | -40 to +60C (-40F to +140F)                  |

# ePMP Portfolio

|                   |  |  |      |                                 |                                |              |                                          |  |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------|--------------|------------------------------------------|-------------------------------------------------------------------------------------|
|                   | MicroPoP                                                                          | Connectorized   Integrated                                                        | GPS Sync Radio                                                                                                                                                                                                                                                                                                                                                                                                                     | Force 130                       | Force 180                      | Force 190    | Force 200                                | Access Point with Intelligent Filtering                                             |
| Frequency Band(s) | 5GHz                                                                              | 2.4 GHz, 5 GHz<br>2.4/2.5 GHz<br>6.4 GHz                                          | 5 GHz                                                                                                                                                                                                                                                                                                                                                                                                                              | 5 GHz<br>2.4 GHz                | 5 GHz                          |              | 5 GHz<br>2.4 GHz                         | 5 GHz                                                                               |
| Channel Size      | 20 40 80 MHz                                                                      | 5 10 20 40 MHz                                                                    | 5 10 20 40 MHz                                                                                                                                                                                                                                                                                                                                                                                                                     | 5 10 20 40 MHz                  |                                |              |                                          | 5 10 20 40 MHz                                                                      |
| Physical Layer    | 2 x 2 MIMO 802.11ac Wave 2 256QAM                                                 | 2 x 2 MIMO 802.11n-64QAM                                                          | 2 x 2 MIMO 802.11n-64QAM                                                                                                                                                                                                                                                                                                                                                                                                           | 2 x 2 MIMO / OFDM 802.11n-64QAM |                                |              |                                          | 2 x 2 MIMO / OFDM 802.11n-64QAM                                                     |
| Interface         | Gigabit                                                                           | 100 Mbit<br>2 <sup>nd</sup> Ethernet port<br>PoE out                              | Gigabit                                                                                                                                                                                                                                                                                                                                                                                                                            | 100 Mbit                        | Gigabit                        | 100 Mbit     | Gigabit                                  | Gigabit                                                                             |
| Environmental     | IP67                                                                              | IP55                                                                              | IP55                                                                                                                                                                                                                                                                                                                                                                                                                               | IP55                            |                                |              |                                          | IP55                                                                                |
| Latency           | 5~7ms                                                                             | 15~17ms                                                                           | 5~7ms                                                                                                                                                                                                                                                                                                                                                                                                                              | 5-7 ms                          | 5~7ms                          | 2~3ms        | 2~3ms                                    | 5~7ms                                                                               |
| Performance       | Up to 600 Mbps                                                                    | 200+ Mbps                                                                         | 200+ Mbps                                                                                                                                                                                                                                                                                                                                                                                                                          | 200+ Mbps                       |                                |              |                                          | 200+ Mbps                                                                           |
| Powering Methods  | 56v PoE<br>802.3at                                                                | 30V PoE<br>Cambium proprietary                                                    | 30V PoE<br>802.3af                                                                                                                                                                                                                                                                                                                                                                                                                 | 24V Std PoE                     | 30V PoE<br>Cambium proprietary |              |                                          | 56V PoE<br>802.3at                                                                  |
| Power Consumption | 13w                                                                               | 7 W max, 5 W typical                                                              | 10 W max, 7.5 W typical                                                                                                                                                                                                                                                                                                                                                                                                            | 10 W Max, 5 W typical           |                                |              |                                          | 20 W Max                                                                            |
| Max Tx Power      | 26 dBm                                                                            | 30 dBm                                                                            | 30 dBm                                                                                                                                                                                                                                                                                                                                                                                                                             | 28 dBm                          | 30 dBm                         | 27 dBm       | 30 dBm                                   | 30 dBm                                                                              |
| Antenna           | 8 dBi integrated omni                                                             | 2.4 GHz-integrated<br>5 GHz-RP-SMA                                                | RP-SMA                                                                                                                                                                                                                                                                                                                                                                                                                             | Integrated:13 dBi               | Integrated: 16 dBi             | Dish: 22 dBi | Dish:<br>2.4GHz 17 dBi<br>5 GHz – 25 dBi | 90/120° Sector: 17dBi<br>Optional beamforming                                       |
| Modes             | AP: 120 subscribers<br>PTP                                                        | AP: 120 subscribers<br>SM<br>PTP                                                  | AP: 120 subscribers<br>PTP                                                                                                                                                                                                                                                                                                                                                                                                         | SM<br>PTP                       |                                |              |                                          | AP: 120 subscribers<br>PTP                                                          |

# ePMP Portfolio

|                   | ePMP™ Force 300                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     | ePMP 3000                                                                           |                                                                                     |
|-------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                   |  |  |  |  |  |  |  |  |  |
|                   | Force 300-13L                                                                     | Force 300-13                                                                      | Force 300-16                                                                      | Force 300-19                                                                       | Force 300-25                                                                        | Force 300 CSM                                                                       | Force 300-19R                                                                       | 3000L                                                                               | ePMP 3000 Access Point with MU-MIMO                                                 |
| Frequency Band(s) | 5 GHz                                                                             |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Channel Size      | 20 40 80 MHz                                                                      |                                                                                   |                                                                                   |                                                                                    |                                                                                     | +5/10 MHz in PTP                                                                    |                                                                                     |                                                                                     | 20 40 80 MHz                                                                        |
| Physical Layer    | 2 x 2 MIMO / OFDM 802.11ac Wave 2 256QAM                                          |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     | 2 x 2 MIMO 802.11ac Wave 2 256QAM                                                   | 4 x 4 MU-MIMO 802.11ac Wave 2 256QAM                                                |
| Interface         | Gigabit                                                                           |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     | Gigabit                                                                             | Gigabit/SFP                                                                         |
| Environmental     | IP55                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     | IP68                                                                                |                                                                                     | IP68                                                                                | IP55                                                                                |
| Latency           | 5~7ms                                                                             |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     | 5~7ms                                                                               | 5~7ms                                                                               |
| Performance       | Up to 400 Mbps                                                                    | Up to 600 Mbps                                                                    |                                                                                   |                                                                                    |                                                                                     |                                                                                     | Up to 600 Mbps                                                                      |                                                                                     | 1+ Gbps                                                                             |
| Powering Methods  | 30V Cambium PoE                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     | 30V Cambium PoE                                                                     | 56V PoE 802.3at                                                                     |
| Power Consumption | 12 W                                                                              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     | 12 W                                                                                | 21 W                                                                                |
| Max Tx Power      | 28 dBm                                                                            | 28 dBm                                                                            | 29 dBm                                                                            | 28 dBm                                                                             | 28 dBm                                                                              | 29 dBm                                                                              | 28 dBm                                                                              | 29 dBm                                                                              | 30 dBm                                                                              |
| Antenna           | 13 dBi Integrated                                                                 | 13 dBi Integrated                                                                 | 16 dBi Integrated                                                                 | 19 dBi Panel                                                                       | 25 dBi Dish                                                                         | RP-SMA                                                                              | 19 dBi Panel                                                                        | 90/120° Sector:                                                                     | 4 x 4 MU-MIMO sector / Optional UL beamforming                                      |
| Modes             | SM PTP                                                                            | SM PTP                                                                            | SM PTP                                                                            | SM PTP                                                                             | SM PTP                                                                              | SM PTP                                                                              | SM PTP                                                                              | AP: 64 Subscribers                                                                  | AP: 120 subscribers                                                                 |

## XV3-8



**XV3-8 is a high-performance, high network density Wi-Fi 6 access point. High-density networks are supported by the 5 GHz SDR radios and 8x8 antenna chains on the 5GHz band. XV3-8 is supported by either the Cambium XMS Cloud or Cambium cnMaestro™ Cloud or cnMaestro on-premises management system. It competes at the high end of the market against the best from Cisco, Aruba, and others.**

- 5 GHz radio with 8x8, or dual 5 GHz radios, 4x4
- 2.4 GHz radio with 4x4
- 5 Gb Ethernet port + 1GE
- Dedicated scan radio, BLE radio
- WPA3 security
- Five radio architecture delivers edge services
- Software defined radios for high-density, flexible installation
- 6 Gbps aggregate data rate
- Dedicated scanning radio for improved RF optimization, DFS
- Policy-based application control and visibility
- EasyPass access services with Azure and Google G-suite integration

## XV2-2



**The XV2-2 is a dual-radio Wi-Fi 6 access point designed to bring the power of 802.11ax to small enterprise and any market that needs a medium-density network upgrade at a value-based price. Wi-Fi 6 technology delivers higher network speeds and enables more connected devices at higher packet quality.**

- 5 GHz radio (802.11a/n/ac wave 2/ax), 2x2
- 2.4 GHz radio (802.11b/g/n/ac wave 2/ax), 2x2
- 512 Clients, 16 SSID
- WPA3 security
- Delivers edge services
- Software-defined radios for flexible installation
- Policy-based application control and visibility
- EasyPass access services with Azure and Google G-suite integration

# Wi-Fi X Series Indoor Portfolio

- 2.4 GHz / 5 GHz dual band 802.11ac Wave 2
- SDR = Software Defined Radios (unlocked 2.4 GHz or 5 GHz operation)
- Up to 13.8 Gbps Wi-Fi BW
- Up to 960 clients per AP
- Office/classroom/conference use cases
- Unique high-density quad radio models
- Integrated Application Policy Control supporting 2000+ apps



|                  | X2-120                     | XD2-230                                     | XD2-240         | XD4-130                                   | XD4-240         | XA4-240                          |
|------------------|----------------------------|---------------------------------------------|-----------------|-------------------------------------------|-----------------|----------------------------------|
| <b>Radios</b>    | 2<br>2x2                   | 1 x SDR*<br>1 x 5 GHz<br>3x3                | 2 x SDR*<br>4x4 | 4 x SDR*<br>3x3                           | 4 x SDR*<br>4x4 | 1 x SDR*<br>3 x 5 GHz<br>4x4     |
| <b>BLE</b>       | No                         | Yes                                         | Yes             | No                                        | Yes             | Yes                              |
| <b>Wi-Fi</b>     | 11ac Wave 1                | 11ac Wave 2                                 | 11ac Wave 2     | 11ac Wave 1                               | 11ac Wave 2     | 11ac Wave 2                      |
| <b>Antennas</b>  | Internal                   | Internal                                    | Internal        | Internal                                  | Internal        | External<br>RPSMA                |
| <b>Ethernet</b>  | 2 x GE                     | 2 x GE                                      | 2 x GE          | 2 x GE                                    | 2.5GE + GE      | 2.5GE + GE                       |
| <b>Total BW</b>  | 867 Mbps                   | 3.9 Gbps                                    | 5.2 Gbps        | 5.2 Gbps                                  | 13.8 Gbps       | 13.8 Gbps                        |
| <b>Key Value</b> | General use,<br>high value | 2-4X throughput vs competitive<br>solutions |                 | High density,<br>significantly reduce TCO |                 | Specialized for<br>public venues |

# Wi-Fi X Series Outdoor Portfolio

- Software-defined radios support 2X the 5 GHz capacity per AP
- Operates in extreme environmental conditions
- Flexible coverage options using external antennas
- Manage from XMS-Cloud or XMS-Enterprise
- EasyPass access services
- Application Policy Control supporting 2000+ apps
- IP67 Environmental Certification



|                     | XH2-240                                               |
|---------------------|-------------------------------------------------------|
| Radios              | 1 – 2.4/5 GHz SDR; 1 – 5 GHz                          |
| Wi-Fi               | Both radios – 4x4:4, 802.11ac Wave 2                  |
| Max Wi-Fi Bandwidth | 6.9 Gbps                                              |
| Ethernet            | 2 – 1 GbE                                             |
| BLE                 | Yes                                                   |
| Environment         | -40°C to 55°C (-40°F to 131°F)                        |
| Key Value           | 2X the user/device density of other outdoor solutions |

# Wi-Fi E Series Indoor Portfolio

- 2.4 GHz / 5 GHz dual band 802.11abgnac Wave 2
- High-efficiency, high-gain antennas
- 256–512 clients per AP
- 1.3–2.1 Gbps 5 GHz PHY Rate
- DPI AppQoS engine
- Mid-market enterprise, hospitality, logistics, retail
- Enhanced roaming, RF aware

|                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                    |  |  |  |  |
|                    | <b>e425</b>                                                                         | <b>e430</b>                                                                         | <b>e410</b>                                                                         | <b>e600</b>                                                                         |
| <b>Radios</b>      | Dual band 2x2                                                                       | Dual band 2x2                                                                       | Dual band 2x2                                                                       | Dual band 4x4                                                                       |
| <b>Wi-Fi</b>       | 11ac.wav2                                                                           | 11ac.wav2                                                                           | 11ac.wav2                                                                           | 11ac.wav2                                                                           |
| <b>5 GHz EIRP</b>  | 25 dBm                                                                              | 26 dBm                                                                              | 30.5 dBm                                                                            | 34 dBm                                                                              |
| <b>Ethernet</b>    | 3 x GE PoE out                                                                      | 4 x GE PoE out                                                                      | 1 x GE                                                                              | 2 x GE                                                                              |
| <b>BLE</b>         | No                                                                                  | Yes                                                                                 | No                                                                                  | Yes                                                                                 |
| <b>Environment</b> | Wall plate                                                                          | Wall plate                                                                          | Indoor                                                                              | Indoor                                                                              |
| <b>Key Value</b>   | Flexible mounting<br>USB port                                                       | Flexible mounting                                                                   | Cost-effective 2x2                                                                  | Cost-effective 4x4                                                                  |

# Wi-Fi Series E Outdoor Portfolio

- 2.4GHz / 5GHz dual band 802.11abgnac Wave 2
  - High-efficiency, high-gain antennas
  - 256–512 clients per AP
  - 1.3–2.1 Gbps 5 GHz PHY Rate
  - DPI AppQoS engine
  - Mid-market enterprise, hospitality, logistics, retail
  - Enhanced roaming, RF aware
- Migration path to 802.11ax Wi-Fi 6

|                    |  |  |  |  |
|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                    | e500/501/502                                                                        | e505                                                                                | e510                                                                                | e700                                                                                |
| <b>Radios</b>      | Dual band 2x2                                                                       | Dual band 2x2                                                                       | Dual band 2x2                                                                       | Dual band 4x4                                                                       |
| <b>Wi-Fi</b>       | 11ac.wav1                                                                           | 11ac.wav2                                                                           | 11ac.wav2                                                                           | 11ac.wav2                                                                           |
| <b>5 GHz EIRP</b>  | 33/36/36 dBm                                                                        | 26 dBm                                                                              | 35 dBm                                                                              | 36 dBm                                                                              |
| <b>Ethernet</b>    | 2 x GE                                                                              | 1 x GE                                                                              | 1 x GE                                                                              | 2 x GE                                                                              |
| <b>BLE</b>         | No                                                                                  | No                                                                                  | No                                                                                  | Yes                                                                                 |
| <b>Environment</b> | Outdoor IP67 -20° to 65°C                                                           | Outdoor IP67, -30° to 65°C                                                          | Outdoor IP67, LTE filter -40° to 65°C                                               | Outdoor IP67, LTE filter -20° to 65°C                                               |
| <b>Key Value</b>   | 5 dBi (e500)<br>13 dBi 120° (e501)<br>17 dBi 30° (e502)                             | Small form factor                                                                   | High gain 8 dBi omni<br>Shock & Vib certified                                       | High perf                                                                           |

# Wi-Fi R Series Residential Portfolio

- Up to dual radio 802.11ac
- Multi-functional home AP reduces complexity
- Integrated WDS MESH
- Hardware accel NAT
- Residential Wi-Fi
- Managed Wi-Fi SME

|                  |  |  |  |  |                           |
|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|                  | r190W                                                                               | r190V                                                                               | r195W                                                                               | r201                                                                                | r201P                                                                                                        |
| <b>Radios</b>    | Single band 2x2                                                                     | Single band 2x2                                                                     | Dual band 2x2                                                                       | Dual band 2x2                                                                       | Dual band 2x2                                                                                                |
| <b>Wi-Fi</b>     | 11n (2.4 GHz)                                                                       | 11n (2.4 GHz)                                                                       | 11ac                                                                                | 11ac                                                                                | 11ac                                                                                                         |
| <b>5GHz</b>      | No                                                                                  | No                                                                                  | Yes                                                                                 | Yes                                                                                 | Yes                                                                                                          |
| <b>Num SSID</b>  | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                                            |
| <b>Ethernet</b>  | 5 x FE                                                                              | 5 x FE                                                                              | 5 x GE                                                                              | 5 x GE                                                                              | 5 x GE                                                                                                       |
| <b>USB</b>       | No                                                                                  | No                                                                                  | No                                                                                  | Yes                                                                                 | Yes                                                                                                          |
| <b>ATA</b>       | No                                                                                  | Yes                                                                                 | No                                                                                  | Yes                                                                                 | Yes                                                                                                          |
| <b>Pwr Out</b>   | No                                                                                  | No                                                                                  | No                                                                                  | No                                                                                  | Yes                                                                                                          |
| <b>Key Value</b> | Entry level 11n home AP;<br>With optional 2 x ATA voice ports                       |                                                                                     | Better coverage & surge protection;<br>Entry-level pricing                          |                                                                                     | Multi-function home AP with ATA ports and Cambium 30V power;<br>Reduce extra devices and simplify deployment |

# Switch Portfolio

**Next-generation switching platform offering a cloud-managed, high-performance, feature-rich, enterprise-grade ethernet switching solution.**

The cnMatrix™ series of fully managed switches delivers full Layer 2 and Layer 3 capabilities with enhanced access security. cnMatrix switches deliver power savings with several models offering fanless operation. The cnMatrix switch series offers flexibility with 4–10 Gbps (SFP+) uplinks on the 28-port models while offering 2–1 Gbps (SFP) uplink ports on the 10-port models.

- Easy and simple free cloud management with cnMaestro™
- Zero-touch deployment of switches makes deployment easy
- Zero-touch policy-based configuration enables automation and reduces errors and network downtime
- Device profiling, automatic port configuration and network segmentation improves security posture of the network
- Wireless Aware: Together with Cambium Networks' Wi-Fi 6 solution, enables a simple, easy-to-use cloud managed unified wired-wireless access solution



|                          | EX2052   | EX2052-P | EX2052R-P | EX2016M-P | EX2028P  | EX2028   | EX2010P  | EX2010   |
|--------------------------|----------|----------|-----------|-----------|----------|----------|----------|----------|
| <b>Throughput</b>        | 176 Gbps | 176 Gbps | 176 Gbps  | 86 Gbps   | 128 Gbps | 128 Gbps | 20 Gbps  | 20 Gbps  |
| <b>PoE Enabled Ports</b> | NA       | 48       | 48        | 14        | 24       | NA       | 8        | NA       |
| <b>10/100/1000 Ports</b> | 48       | 48       | 48        | 8         | 24       | 24       | 8        | 8        |
| <b>Uplink Ports</b>      | 4 SFP+   | 4 SFP+   | 4 SFP+    | 2 SFP+    | 4 SFP+   | 4 SFP+   | 2 SFP    | 2 SFP    |
| <b>Rack Mount Kit</b>    | Yes      | Yes      | Yes       | Yes       | Yes      | Yes      | Optional | Optional |
| <b>Internal Fans</b>     | 2        | 2        | 2         | 2         | 2        | Fanless  | Fanless  | Fanless  |



N500 900 MHz



N500 700 MHz



N500 450 MHz



N500 220 MHz



N500 I/O Expander

## Key Statement

For outdoor critical infrastructure operations, cnReach™ transports process monitoring and control data from the remote sensor or PLC/RTU back to the operations center, supporting real-time automated decision making and on-going analytics. Covering large geographic areas, hard-to-reach terrain and challenging spectrum environments, cnReach delivers reliable, secure connectivity to the petrochemical, electric utility, water/wastewater/stormwater, rail and transportation industries. cnReach eases the migration to modern networks by combining legacy serial and analog/digital I/O with TCP/IP and Ethernet connectivity.

| Region              | NA/CALA/Australia/NZ                                                        | US                                                                          | Global                                                                                                       | US                                                                          | Global                                                             |
|---------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------|
| Frequency Bands     | ISM mode: 902–928 MHz; (915–928 MHz in Australia)<br>MAS mode: 928–960 MHz  | 757–758 MHz and 787–788 MHz                                                 | 406–430 MHz and 450–470 MHz<br>ETSI RED 406–470 MHz                                                          | 217–222 MHz                                                                 |                                                                    |
| Channel Size        | ISM: 76 / 154 / 207 / 310 / 600 / 1200 kHz<br>MAS: 12.5 / 25 / 50 kHz       | 12.5, 25, 50, 100, 200, 250 kHz                                             | 12.5 / 25 kHz (50 / 100 kHz available, regulations permitting)                                               | 12.5 / 15 / 25 / 50 / 100 / 200 kHz                                         |                                                                    |
| Modulations         | MSK / 2FSK / BPSK / QPSK / 8PSK / 16PSK / 16QAM / 32QAM                     | MSK / QPSK / 8PSK / 16QAM / 32QAM                                           | MSK / QPSK / 8PSK / 16QAM / 32QAM                                                                            | MSK / QPSK / 8PSK / 16QAM / 32QAM                                           |                                                                    |
| Max Tx Power        | Up to 1 W (30 dBm) (ISM)<br>Up to 4 W (36 dBm) (MAS)                        | Up to 10 W (40 dBm)                                                         | FCC: 406.1 - 430 MHz (up to 2 W / 33 dBm); 450-470 MHz (up to 8 W / 39 dBm);<br>ETSI RED: Up to 8 W (39 dBm) | 217-220: Up to 2 W<br>220-222 Up to 5 W                                     |                                                                    |
| Adaptive Modulation | Yes                                                                         | Yes                                                                         | Yes                                                                                                          | Yes                                                                         |                                                                    |
| Security            | 128/256-bit AES encryption and secure management interfaces (HTTPS, SNMPv3) |                                                                             |                                                                                                              |                                                                             |                                                                    |
| Interfaces          | Two Ethernet<br>Two Serial (RS-232/422/485)<br>Optional Analog/Digital GPIO | Two Ethernet<br>Two Serial (RS-232/422/485)<br>Optional Analog/Digital GPIO | Two Ethernet<br>Two Serial (RS-232/422/485)<br>Optional Analog/Digital GPIO                                  | Two Ethernet<br>Two Serial (RS-232/422/485)<br>Optional Analog/Digital GPIO | Two Ethernet<br>Two Serial (RS-232/422/485)<br>Analog/Digital GPIO |
| LINKPlanner         | Yes                                                                         | Yes                                                                         | Yes                                                                                                          | Yes                                                                         |                                                                    |
| cnMaestro™          | Yes                                                                         | Yes                                                                         | Yes                                                                                                          | Yes                                                                         |                                                                    |

## Professional-grade wireless for mission-critical CCTV & security applications



Dedicated HUB



Dual Purpose Hardware – HUB or Medium Range Client



Long Range Client



HUB Antenna

| Model                                                      | Hub-FLEXr<br>(with GPS Sync)                                                                                                                                                                                     | Hub-360                                                                                                                                                                                                          | Client-MICRO                                                                                                                                                                                                     | Client-MINI                                                                                                                                                                                                      | Client-MAXr                                                                                                                                                                                                      | Twistport &<br>60-Degree Horn                         |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Frequency Band(s)                                          | 4.910–5.970 GHz                                                                                                                                                                                                  | 4.910–5.970 GHz                                                                                                                                                                                                  | 4.910–5.970 GHz                                                                                                                                                                                                  | 4.910–5.970 GHz                                                                                                                                                                                                  | 4.910 GHz–5.970 GHz                                                                                                                                                                                              | 5.18–6.00 GHz                                         |
| Channel Size                                               | 20 40 80 MHz                                                                                                                                                                                                     | 20 40 80 MHz                                                                                                                                                                                                     | 20 40 80 MHz                                                                                                                                                                                                     | 20 40 80 MHz                                                                                                                                                                                                     | 20 40 80 MHz                                                                                                                                                                                                     |                                                       |
| Max Tx Power                                               | +29 dBm                                                                                                                                                                                                          | +29 dBm                                                                                                                                                                                                          | +28 dBm                                                                                                                                                                                                          | +29 dBm                                                                                                                                                                                                          | +29 dBm                                                                                                                                                                                                          |                                                       |
| Max Throughput                                             | 600 Mbps                                                                                                                                                                                                         | 600 Mbps                                                                                                                                                                                                         | 600 Mbps                                                                                                                                                                                                         | 600 Mbps                                                                                                                                                                                                         | 600 Mbps                                                                                                                                                                                                         |                                                       |
| Interface                                                  | Gigabit Ethernet, 100/1000BaseT                                                                                                                                                                                  | Gigabit Ethernet, 100/1000BaseT                                                                                                                                                                                  | Gigabit Ethernet, 100/1000BaseT                                                                                                                                                                                  | Gigabit Ethernet, 100/1000BaseT                                                                                                                                                                                  | Gigabit Ethernet, 100/1000BaseT                                                                                                                                                                                  |                                                       |
| Power                                                      | 30V Passive POE (14-30V)<br>4,5 +; 7,8 –  or  4,5 -; 7,8 +<br>7W typical, 12W max                                                                                                                                | 30V Passive POE (14-30V)<br>4,5 +; 7,8 –  or  4,5 -; 7,8 +<br>7W typical, 12W max<br>Or 802.3at                                                                                                                  | 30V Passive POE (14-30V)<br>4,5 +; 7,8 –  or  4,5 -; 7,8 +<br>7W typical, 12W max                                                                                                                                | 30V Passive POE (14-30V)<br>4,5 +; 7,8 –  or  4,5 -; 7,8 +<br>7W typical, 12W max                                                                                                                                | 30V Passive POE (14-30V)<br>4,5 +; 7,8 –  or  4,5 -; 7,8 +<br>7W typical, 12W max                                                                                                                                |                                                       |
| Antenna Gain/Coverage                                      | Connectorized, requires 3 <sup>rd</sup> -party ant<br>2 x 50 ohm, RP (Reverse Polarity) SMA<br>Or RF Elements Twistport™ Adaptor                                                                                 | 8 dBi   360 degree                                                                                                                                                                                               | 13 dBi   30 degree   0–2 mile                                                                                                                                                                                    | 16 dBi   15 degree   1–3 mile                                                                                                                                                                                    | 19dBi  15 degree   2–4 mile                                                                                                                                                                                      | 17 dBi   60 degree                                    |
| Mounting                                                   | 1–2” Pole Mount included<br>Wall Mount optional                                                                                                                                                                  | 1–2” Pole Mount included<br>Wall Mount optional                                                                                                                                                                  | 1–2” Pole Mount included<br>Wall Mount optional                                                                                                                                                                  | 1–2” Pole Mount included<br>Wall Mount optional                                                                                                                                                                  | 1–2” Pole Mount included<br>Wall Mount optional                                                                                                                                                                  | 22–80 mm Pole Mount included                          |
| Environmental                                              | IP67<br>-22°F to +140°F (-30°C to +60°C)                                                                                                                                                                         | IP67<br>-22°F to +140°F (-30°C to +60°C)                                                                                                                                                                         | IP55<br>-22°F to +140°F (-30°C to +60°C)                                                                                                                                                                         | IP55<br>-22°F to +140°F (-30°C to +60°C)                                                                                                                                                                         | IP67<br>-22°F to +140°F (-30°C to +60°C)                                                                                                                                                                         | IP55<br>-31°F to +131°F (-35°C to +55°C)              |
| Configuration                                              | Cambium EZconfig or Web GUI                                                                                                                                                                                      | Cambium EZconfig or Web GUI                                                                                                                                                                                      | Cambium EZconfig or Web GUI                                                                                                                                                                                      | Cambium EZconfig or Web GUI                                                                                                                                                                                      | Cambium EZconfig or Web GUI                                                                                                                                                                                      |                                                       |
| Monitoring                                                 | Genetec VMS. ONVIF supported                                                                                                                                                                                     | Genetec VMS. ONVIF supported                                                                                                                                                                                     | Genetec VMS. ONVIF supported                                                                                                                                                                                     | Genetec VMS. ONVIF supported                                                                                                                                                                                     | Genetec VMS. ONVIF supported                                                                                                                                                                                     |                                                       |
| Warranty                                                   | 3 Year                                                                                                                                                                                                           | 3 Year                                                                                                                                                                                                           | 3 Year                                                                                                                                                                                                           | 3 Year                                                                                                                                                                                                           | 3 Year                                                                                                                                                                                                           | 3 Year                                                |
| Common Part Numbers<br>others available, see<br>price list | CV-HC2RPUSA-US (FCC compliant, US Cord)<br>CV-HC2RPUSA-IC (IC compliant, US Cord)<br>CV-HC2RPEUA-EU (EU compliant, EU Cord)<br>CV-HC2RPUKA-EU (EU compliant, UK Cord)<br>CV-HC2RPEUA-RW (ROW compliant, EU Cord) | CV-H00RPUSA-US (FCC compliant, US Cord)<br>CV-H00RPUSA-IC (IC compliant, US Cord)<br>CV-H00RPEUA-EU (EU compliant, EU Cord)<br>CV-H00RPUKA-EU (EU compliant, UK Cord)<br>CV-H00RPEUA-RW (ROW compliant, EU Cord) | CV-D13SPUSA-US (FCC compliant, US Cord)<br>CV-D13SPUSA-IC (IC compliant, US Cord)<br>CV-D13SPEUA-EU (EU compliant, EU Cord)<br>CV-D13SPUKA-EU (EU compliant, UK Cord)<br>CV-D13SPEUA-RW (ROW compliant, EU Cord) | CV-D16SPUSA-US (FCC compliant, US Cord)<br>CV-D16SPUSA-IC (IC compliant, US Cord)<br>CV-D16SPEUA-EU (EU compliant, EU Cord)<br>CV-D16SPUKA-EU (EU compliant, UK Cord)<br>CV-D16SPEUA-RW (ROW compliant, EU Cord) | CV-C19RPUSA-US (FCC compliant, US Cord)<br>CV-C19RPUSA-IC (IC compliant, US Cord)<br>CV-C19RPEUA-EU (EU compliant, EU Cord)<br>CV-C19RPUKA-EU (EU compliant, UK Cord)<br>CV-C19RPEUA-RW (ROW compliant, EU Cord) | TPA-ePMP<br>+ HG3-TP-A60<br><br>Cambium Networks, Ltd |

# Planning & Design Software Overview



## cnHeat

Improve the precision of site surveys while saving time and money. Heat map displays provide the exact antenna location that offers the best connectivity.



## cnArcher™

Improve installation accuracy with the free Android™ app that gives field techs the information they need to configure and properly align PMP subscriber modules.



## LINKPlanner

Quickly and easily design networks for optimal deployment and cost effectiveness.



## Wi-Fi Designer

Fast and easy design tool for Cambium Wi-Fi networks. Available online and free to use for anyone.

### Typical Application

Quickly pre-qualify new customers saving time and money. Identify and market to addresses of unserved customers. Determine optimal greenfield site placement.

**LOCATE** subscriber installations

**IDENTIFY** unserved customers

**OPTIMIZE** greenfield site placements

Designed with input from field technicians and years of experience on our millions of wireless broadband modules deployed, cnArcher validates configuration and alignment in seconds.

Boost the number of installs done right the first time and increase customer satisfaction. Eliminate problems and focus your manpower on connecting new subscribers as your network grows.

LINKPlanner allows you to model scenarios, based on geography, distance, antenna height, transmit power and other factors, to optimize system performance before purchase. Quickly design networks for optimal deployment and cost effectiveness with ease. Available for Microsoft® Windows® and Mac® systems, LINKPlanner is a free, user-friendly link-design tool.

Wi-Fi Designer enables the design of Wi-Fi networks. Import floor plans, draw walls, place APs and model AP coverage to generate the bill of materials. Supports all indoor and outdoor APs across the Cambium Wi-Fi 6, cnPilot™, and Xirrus product lines. Creates PDF output report that includes heat maps and BOM.

### Products Supported

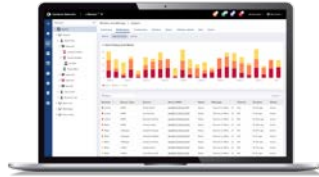
- ePMP™
- PMP

- ePMP
- PMP 450

- cnReach™
- ePMP
- PMP
- PTP

- Wi-Fi 6
- Xirrus
- cnPilot

# Management & Provisioning Overview



## cnMaestro™

cnMaestro is a cloud-based or on-premises software platform for secure, end-to-end network control.



## XMS & EasyPass

XMS is a cloud or on-premises platform providing powerful, scalable management of Cambium Wi-Fi and switching.



## Swift

Cloud-based management of your enterprise networks right from your phone. Configure your networks in a few taps, get alerts when something goes wrong and view the most relevant statistics.

### Typical Application

cnMaestro wireless network manager simplifies device management by offering full network visibility. View and perform a full suite of wireless network management functions in real time. Optimize system availability, maximize throughput and meet emerging needs of business and residential customers.

XMS provides a comprehensive platform for managing the Wi-Fi access network. Simple UX workflows and zero-touch provisioning make rolling out large networks with 1000s of APs simple and easy. Application Control enables visibility and policy control for over 2,000 apps. Integrated troubleshooting and analytics simplify problem solving and customer support. EasyPass provides flexible access control for employees, guest, customers, BYOD and IoT.

Swift makes it easy for non-experts to deploy an enterprise network in minutes. It takes you step by step through the process of onboarding Wi-Fi APs and switches, including meshed devices. Create separate, secure networks for your employee and guests. It is cloud-based so you can remotely manage your network from your phone. MSPs can manage multiple networks with a single login. Swift supports multiple users with *view* or *edit* roles. Swift is available as a free download on the Apple Store and Google Play Store.

### Products Supported

- Wi-Fi 6
- cnPilot™
- cnMatrix™
- cnReach™
- ePMP™
- PMP
- PTP

- Wi-Fi 6
- Xirrus
- cnMatrix™

- Wi-Fi 6
- cnPilot E series
- cnMatrix



Cambium Networks<sup>TM</sup>