



Connect802 Corporation  
111 Deerwood Road, Suite 200  
San Ramon, CA 94583  
(925) 552-0802  
www.Connect802.com

## CW600AG DOCSIS WI-FI ACCESS POINT

### The Easy Way for CATV Operators to Offer Metro-Area Wi-Fi Service

- Simply attach to your cable system on pole locations in the Wi-Fi coverage area
- Uses In-Line Power and Splitter
- Subscription and login services using an access controller at your head end
- Full Back-End Web services available for user account management and billing



**CW600AG Water-Tight Housing  
with Built-In Thermal Regulator**

#### Easy HotZone Deployment

The Aphelion CW600AG is an Intelligent Outdoor Multi-Radio Wireless Access Point with integrated CableLabs® certified DOCSIS cable modem, enabling easy HotZone deployments by CATV Operators. The CW600AG is built with ruggedized and weatherized industrial design to withstand harsh outdoor environments. Available in both licensed exempt 5GHz and 2.4GHz spectrums, the Aphelion CW600AG is designed with enhancements to avoid congestion and remain stable with high throughput under noisy wireless environment.

#### Expandable Beyond the CATV Pole Locations

Using Aphelion's patented Intelligent Sequential OS, multiple CW600AG units can be daisy chained over the wireless interfaces to provide even greater coverage without a wired connection, forming large metro area HotZones. Due to our breakthrough technology innovations, the Aphelion CW600AG offers network scalability, extended wireless coverage, expansion in network capacity, powerful routing engine, ease of installation and management via CATV system.

#### Leverage Your Infrastructure Investment by Offering Wi-Fi Service

The Aphelion CW600AG is the most ideal candidate for CATV Operators looking to leverage on existing investments in CATV systems to deliver carrier class wireless services to multiple market segments such as campuses, hospitality, healthcare, warehousing and wider metropolitan areas.



**Connect802 Corporation**  
111 Deerwood Road, Suite 200  
San Ramon, CA 94583  
(925) 552-0802 support@Connect802.com  
www.Connect802.com

# FEATURES



**The Aphelion CW600AG provides a unique integration of industry standard Wi-Fi technology with DOCSIS certified backhaul connectivity to the CATV system.**

**When you're building out a Metro Area HotZone Wi-Fi system on your CATV infrastructure, this is the easiest, most cost-effective approach.**

## **Integrated CableLabs® Certified DOCSIS Cable Modem**

- Leverage the investment in your existing CATV cable system
- No need for separate Ethernet wiring to create an outdoor wireless HotZone
- Works with cable system in-line power and splitter
- Supports full data bandwidth capability of Cable DOCSIS system
- Configuration and management of cable modem via CATV operator's system

## **Certified for Use in Harsh Outdoor Environments**

- IP68 water-tight housing suitable for all ITU-R rain regions
- Thermal cooling fin case design dissipates heat in environments up to 55 C (131 F)
- Built-in automatic thermal sensor and regulator module to facilitate deployment in cold regions
- Operation from -40 C to +55 C; up to 95% non-condensing humidity

## **Complete Commercial Wi-Fi Compatibility**

- Full support for 802.11b/g as found in most notebook computers, handheld PDAs, and wireless Voice-over-IP telephones
- Full support for the 802.11a standard for user's devices operating in the 5.8 GHz unlicensed U-NII band
- Full support for the most advanced security and encryption standards including:
  - Wi-Fi Protected Access (WPA with EAP and TKIP)
  - 802.1x Client and Server
  - WPA2 with Advanced Encryption Standard (AES / 802.11i)
  - MAC address filtering
  - Multiple ESSID broadcast support (and SSID disable)
- Standard Type-N antenna connectors to support the widest range of antenna options

## **WHY YOU SHOULD USE THE APHELION CW600AG...**

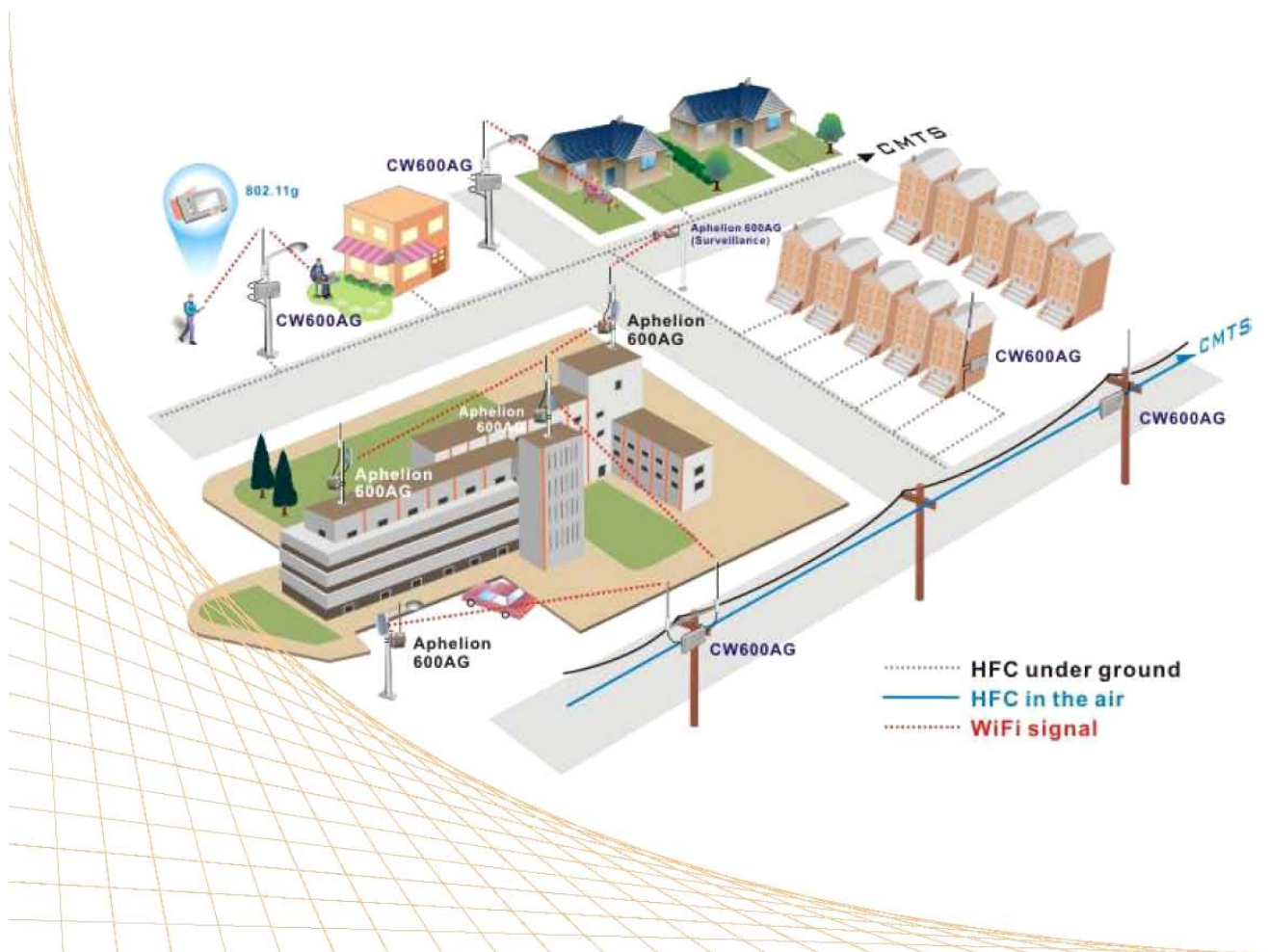
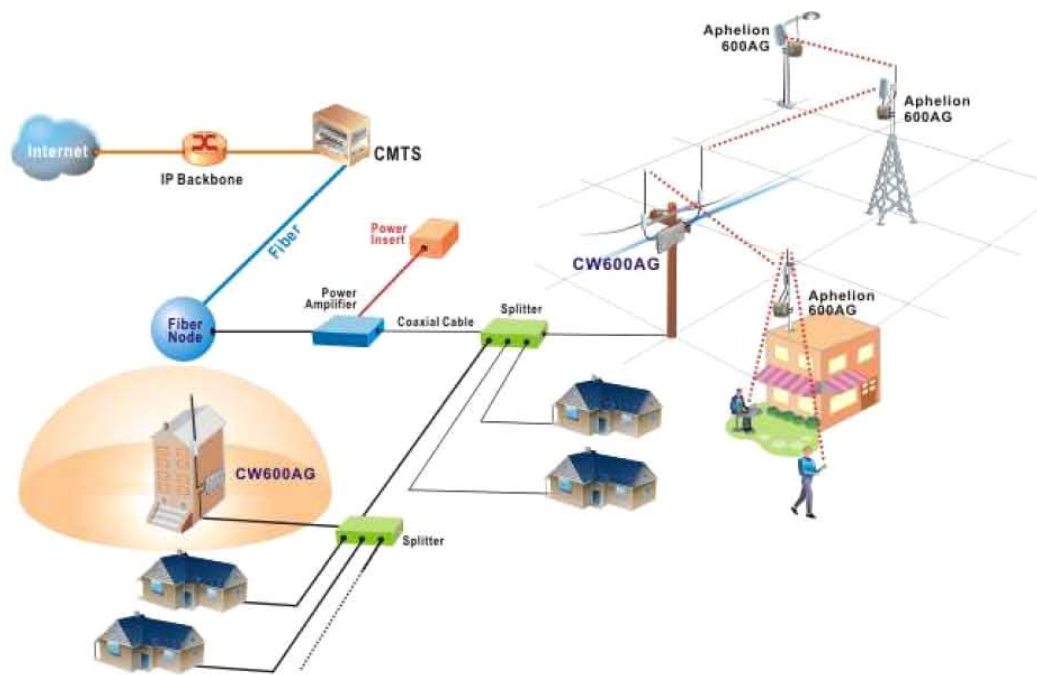
Conventional HotZone implementations typically utilize a 2-radio-per-unit solution. One radio provides Wi-Fi client connectivity while the second radio interconnects between pole locations to create a wireless backhaul. The need for a wireless backhaul creates complexity and adds cost but it's the only option for most Metro Area HotZone systems.

Because you have an existing CATV cable infrastructure you have no need for the features of a "mesh router" or "wireless distribution system" (WDS) outdoor radio unit. You already have the backhaul in place. It's simply a matter of leveraging your infrastructure investment by adding the Wi-Fi client radios at appropriate pole locations.

If you do have to extend the coverage area of your system to locations not easily reached by radios on your CATV poles, the CW600AG provides the capability to implement a multiple-radio solution, identical to other wireless distribution system engineering used for outdoor Wi-Fi systems.

# CATV INTEGRATION EXAMPLES

Straightforward Integration with Your CATV System





# WIRELESS SPECIFICATIONS

The Aphelion CW600AG provides 802.11a/b/g connectivity with excellent transmit power and receive sensitivity. Users of wireless notebook computers and other Wi-Fi devices can expect outdoor connectivity within a range of up to roughly 1000 feet or more (depending on the antennas used with the CW600AG.)

The radios are powered from the CATV system using 36-90V AC (<15W) and can operate in a temperature range of -40C to 65C making them ideal for even the most extreme weather conditions.

## Standard Support

|          |                            |
|----------|----------------------------|
| Wireless | IEEE802.11a, IEEE802.11b/g |
|----------|----------------------------|

## Interface

|          |  |
|----------|--|
| Wireless | Antenna Connector: 2x Reversed Female N-type |
|----------|--|

## Memory

|       |          |
|-------|----------|
| SDRAM | 64 Mbyte |
| Flash | 16Mbyte  |

## Wireless Security

|        |  |
|--------|--|
| SSID   | <ul style="list-style-type: none"> <li>Support Enable/ Disable Broadcast</li> <li>Support Multi-ESSID</li> </ul>   |
| WEP    | <ul style="list-style-type: none"> <li>Support 64bit / 128bit / 152bit Data Encryption</li> <li>Authentication type: Open System / Shared Key</li> </ul> |
| 802.1x | Support 802.1x Client and Server   |
| Radius | Support Radius Client  |
| WPA    | Wi-Fi Protected Access (EAP, TKIP)   |
| WPA2   | AES / 802.11i  |
| MAC    | Support MAC Address Filtering  |

## Configuration & Management

|                     |   |
|---------------------|---|
| Software / Firmware | SMT management menu access via console, telnet and secure SSH telnet to implement including: System configuration & management, Firmware upgrade, Reset to default and configuration backup ...etc. |
|---------------------|---|

## Physical Spec.

|           |  |
|-----------|--|
| Power     | <ul style="list-style-type: none"> <li>From CATV System via Power Control Module Management: Software/Hardware Watch Dog Function and Software Reset AP or Modem Control</li> <li>For CATV Power AC 36~90V, &lt;15W</li> </ul> |
| Dimension | 320(L) x 215(W) x 130(H) mm  |
| Weight    | 3800g  |
| Antenna   | Reversed N-type (Option)   |

## Regulation and Compliance

|        |  |
|--------|--|
| US     | FCC Part 15 Class B & C & E  |
| Europe | ETS 300 328, ETS 301 489-1 & 17, and CE Mark EN55022 class B, EN55024 class B, EN60950 |

## Environment Spec.

|                |   |
|----------------|---|
| Operating Temp | <ul style="list-style-type: none"> <li>Non Heater : -30°C ~ 65°C</li> <li>With heater : -40°C ~ 65°C</li> <li>Built-in heater module is option</li> </ul> |
| Storage        | -40°C ~ 70°C  |
| Humidity       | 5% ~ 95% non-condensing   |

## System Setting

| Standard                   | AP / AP Client / Bridge / Router   |   |
|----------------------------|--|---|
| RF Interface Application   | Interface 1  | Interface 2   |
|                            | <ul style="list-style-type: none"> <li>Access Point (AP)</li> <li>Access Point (AP)</li> <li>Wireless Station (Client)</li> </ul>  | <ul style="list-style-type: none"> <li>Access Point (AP)</li> <li>Wireless Station (Client)</li> <li>Wireless Station (Client)</li> </ul> |
|                            | Support Dynamic WAN Interface assignments  |   |
| Frequency Range            | <ul style="list-style-type: none"> <li>USA: 2.400~2.483GHz, 5.15~5.35GHz, 5.725~5.825GHz</li> <li>Europe: 2.400~2.483GHz, 5.15~5.35GHz, 5.47~5.725GHz</li> <li>Japan: 2.400~2.483GHz, 4.90~5.091GHz, 5.15~5.25GHz</li> <li>China: 2.400~2.483GHz, 5.725~5.85GHz</li> </ul>   |   |
| Channels Support           | <ul style="list-style-type: none"> <li>802.11b/g                             <ul style="list-style-type: none"> <li>US/Canada: 11 (1 ~ 11)</li> <li>Major European country: 13 (1 ~ 13)</li> <li>France: 4 (10 ~ 13)</li> <li>Japan: 11b: 14 (1~13 or 14th), 11g: 13 (1 ~ 13)</li> <li>China: 13 (1 ~ 13)</li> </ul> </li> <li>802.11a                             <ul style="list-style-type: none"> <li>US/Canada: 12 non-overlapping channels (5.15 ~ 5.35GHz, 5.725 ~ 5.825GHz)</li> <li>Europe: 19 non-overlapping channel (5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz)</li> <li>Japan: 4 non-overlapping channels (5.15 ~ 5.25GHz)</li> <li>China : 5 non-overlapping channels (5.725 ~ 5.85GHz)</li> </ul> </li> </ul>   |   |
| Wireless Transmission Rate | <ul style="list-style-type: none"> <li>802.11b/g: 11, 5.5, 2, 1 Mbps, auto-fallback, up to 54 Mbps</li> <li>802.11a: 54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback</li> </ul>  |   |
| Transmitted power          | <ul style="list-style-type: none"> <li>802.11b: 18 dBm</li> <li>802.11g: 18dBm @6Mbps                             <ul style="list-style-type: none"> <li>15dBm @54Mbps</li> </ul> </li> <li>802.11a: 17dBm @6Mbps                             <ul style="list-style-type: none"> <li>13dBm @54Mbps</li> </ul> </li> </ul>  |   |
| Wireless Other Setting     | <ul style="list-style-type: none"> <li>Enable / Disable Broadcast ESSID</li> <li>802.1q VLAN-Multi SSID (ready on Q2,2006)</li> <li>MAC Address Filtering</li> <li>Bandwidth Control of Wireless Client</li> <li>DHCP Client / Server, Fixed IP</li> <li>NAT                             <ul style="list-style-type: none"> <li>Static Routing</li> <li>SNMP v1 &amp; v2</li> <li>RIP v1 &amp; v2</li> </ul> </li> <li>Dual Image (backup)</li> <li>Trunk: Trunking, Smart Traffic Load Balance, One Way Transmit, Failover</li> <li>MS NetBIOS IP Filter Enable / Disable</li> <li>802.11h - Dynamic Frequency Selection (DFS) &amp; Transmit Power Control (TPC)</li> <li>802.11e WiFi QoS (ready on Q2,2006)</li> <li>Wireless Station Fix AP MAC Address Optional</li> <li>Software Alignment / Deployment Tools</li> </ul>  |   |
| Receiver Sensitivity       | <ul style="list-style-type: none"> <li>Receiver Sensitivity: (PER &lt; 8% for 11b; PER &lt; 10% for 11g &amp; 11a)</li> <li>802.11b Sensitivity:                             <ul style="list-style-type: none"> <li>DBPSK (1Mbps) -93 dBm</li> <li>CCK (5.5Mbps) -90dBm</li> <li>DQPSK (2.2Mbps) -92dBm</li> <li>CCK (11 Mbps) -88dBm</li> </ul> </li> <li>802.11g Sensitivity:                             <ul style="list-style-type: none"> <li>BPSK(6Mbps) -89 dBm</li> <li>QPSK(12Mbps) -86 dBm</li> <li>16QAM(24Mbps) -83 dBm</li> <li>64QAM(48Mbps) -77 dBm</li> <li>BPSK(9Mbps) -88 dBm</li> <li>QPSK(18Mbps) -85 dBm</li> <li>16QAM(36Mbps) -80 dBm</li> <li>64QAM(54Mbps) -72 dBm</li> </ul> </li> <li>802.11a Sensitivity:                             <ul style="list-style-type: none"> <li>BPSK(6Mbps) -88 dBm</li> <li>QPSK(12Mbps) -85 dBm</li> <li>16QAM(24Mbps) -82 dBm</li> <li>64QAM(48Mbps) -76 dBm</li> <li>BPSK(9Mbps) -87 dBm</li> <li>QPSK(18Mbps) -84 dBm</li> <li>16QAM(36Mbps) -80 dBm</li> <li>64QAM(54Mbps) -71 dBm</li> </ul> </li> </ul> |   |

# CATV SPECIFICATIONS

The CATV interface is DOCSIS compliant allowing the use of CMTS head end equipment from a number of manufacturers. The CATV system must implement bi-directional amplifiers in those areas where the CW600AG radios will be attached.

| Item                             | Downstream (Receiver)   | Upstream (Transmitter)  |
|----------------------------------|---|---|
| Frequency Range                  | 88MHz ~ 860MHz  | 5MHz ~ 42/65MHz   |
| Modulation                       | 64QAM / 256QAM  | QPSK, 8QAM / 16QAM / 32QAM / 64QAM / 128QAM   |
| Symbol Rate                      | 5.075/5.361/6.952<br>Msymbols / sec   | TDMA:160, 320, 640, 1280, 2560, 5120 Ksymbols/sec<br>S-CDMA:1280, 2560, 5120 Ksymbols / sec   |
| Data Rate                        | 30Mbps/sec (64QAM)<br>43Mbps/sec (256QAM)   | TDMA:0.32 ~ 30.72Mbs<br>S-CDMA:2.56 ~ 35.84 Mbs   |
| RF Input / Output Power          | -15dBmV ~ +15dBmV   | <ul style="list-style-type: none"> <li>+8dBmV ~ + 58dBmV(QPSK)</li> <li>+8dBmV ~ + 55dBmV(8QAM/16QAM)</li> <li>+8dBmV ~ + 54dBmV(32QAM/64QAM)</li> <li>+8dBmV ~ + 53dBmV(S-CDMA)</li> </ul> |
| Carrier To Noise Ratio @BER<10   | <ul style="list-style-type: none"> <li>64QAM: 23.5dB</li> <li>256QAM:30dB</li> </ul>  |   |
| MAC, LLC/SNAP, IP and CPE Filter | DOCSIS RFI  |   |
| Internet Protocol Stack          | ARP, ICMP, IP, TCP/UDP, IGMPv2, RFC826, RFC792, RFC791, RFC768/793  |   |
| Provisioning Applications        | DHCP, TFTP, ToD client, RFC2236   |   |
| SNMP Protocol                    | SNMP v2c, RFC2131/2132, RFC1350, RFC867, SNMPv3, RFC2571, RFC2576   |   |
| MIBs Support                     | RFC1905, RFC1213, RFC2011, RFC2013, RFC2669, RFC2670, RFC2233, RFC1907, RFC1493, draft -ietf-ipcndn - mcns -bpi - mib-01, Qos MIB, RFC2933, BBI+_MIB, RFC2786, Ambit private  |   |
| Power                            | <ul style="list-style-type: none"> <li>From CATV System via Power Control Module Management: Software/Hardware Watch Dog Function and Software Reset AP or Modem Control</li> <li>For CATV Power AC 36~90V, &lt; 7 W</li> </ul> |   |
| Compliance                       | DOCSIS 1.0, 1.1, 2.0 CableLabs® Certified™  |   |

Connect802 Corporation, founded in 1994, is a privately held wireless network design, equipment sales, and consulting firm providing in-building and metro area wireless solutions. The company's products and services are an extension of its flagship patent-pending predictive wireless LAN design methods found in the Connect EZ Solution Suites and Suite Spot Predictive Site Survey. The Connect802 organization includes channel partners and affiliates with installation services available from over 200 locations across the United States.



**Connect802 Corporation**  
 111 Deerwood Road, Suite 200  
 San Ramon, CA 94583  
 (925) 552-0802 support@Connect802.com  
 www.Connect802.com