

## LTE Advanced Carrier Aggregation 600Mbps CAT11 Gateway w/802.11ac

The BulletPlusAC is a industrial strength cellular solution using LTE Advanced Carrier Aggregation technology for critical data applications. The BulletPlusAC provides fast CAT11 CA LTE connections with up to 600 Mbps for today's data intensive applications. The BulletPlusAC features 4x Gigabit LAN Ports, 2x Independent Gigabit WAN Ports, Dual SIM w/Failover, 802.11ac WiFi, RS232/485 Serial Data, 2x Programmable I/O and Standalone GPS.

*CAT11 - 600 Mbps LTE*

*Carrier Aggregation*

*Dual Independent WAN*

*6 Gigabit Ethernet Ports*

*802.11bgna/ac WiFi*

*Dual Serial Ports*



## Features

- Ultra Fast CAT11 LTE Operation
- Up to 600 Mbps Downlink / 75 Mbps Uplink Over Air
- Dual SIM Card Support w/Failover & Load Balancing
- Support for 802.11bgna/ac devices (Up to 1.3 Gbps)
- Firewall with ACL Security, DMZ & Port Forwarding
- 2x Programmable Analog/Digital Inputs or 2 Digital Outputs
- IPSec, GRE / VPN Tunneling
- RS232/485 Serial Data Port / RS232 Console/Data Port
- 6 - 10/100/1000 Ethernet (PoE), (6LAN/2WAN)
- IPv6 & IPv4 Support
- Standalone GPS (TCP/UDP/SMTP)
- Wide Operating Temperature (-40°C to +85°C)
- Data Usage Alerts (Email, SMS)
- User interface via SSH or HTTP/HTTPS web browser
- Microhard NMS Support



# BulletPlusAC

# Specifications

| <b>Cellular Supported Bands</b>    | <p><b>LTE FDD Bands:</b> 1, 2, 3, 4, 5, 7, 8, 12, 13, 17, 20, 25, 26, 28, 29, 30, 66</p> <p><b>LTE TDD Bands:</b> 38, 40, 41</p> <p><b>HSPA+ Bands:</b> 1, 2, 4, 5, 8</p> <p><b>LTE 2DL carrier aggregation combinations</b><br/>North America<br/>B2+B2, B2+B4, B2+B5, B2+B12, B2+B13, B2+B17, B2+B29, B2+B30, B4+B4, B4+B5, B4+B7, B4+B12, B4+B13, B4+B17, B4+B29, B4+B30, B5+B30, B12+B12, B12+B30, B25+B25, B25+B26, B25+B41, B26+B41, B29+B30, B41+B41</p> <p><b>LTE 3DL carrier aggregation combinations</b><br/>North America<br/>B2+B2+B12/17, B2+B2+B13, B2+B2+B4, B2+B4+B5, B2+B4+B12, B2+B4+B13, B2+B4+B29, B2+B5+B30, B2+B12+B12, B2+B12+B30, B2+B29+B30, B4+B4+B5, B4+B4+B7, B4+B4+B12, B4+B4+B13, B4+B5+B30, B4+B12+B12, B4+B12+B30, B4+B29+B30, B25+B26+B41, B25+B41+B41, B26+B41+B41, B41+B41+B41</p>   | <b>SMS</b>                | SMS to/from Ethernet via Telnet<br>SMS Alerts<br>SMS Remote Control  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
|------------------------------------|---|---------------------------|--|----------|---------|--------|---|----|---------|---------|---|----|---------|--------|---|----|---------|---------|---|----|---------|--------|---|----|---------|---------|---|----|---------|------|----------|----|---------|------|----------|----|---------|------|----------|----|---------|------|----------|----|---------|------|------------|----|---------|------|------------|----|---------|------|------------|----|---------|------|------------|----|---------|------|------------|----|---------|------|------------|----|---------|-----------------|---|
| <b>Cellular Data Features*</b>     | <p>LTE Up to 600 Mbps DL w/3x CA DL, 256QAM DL<br/>Up to 75 Mbps UL w/UL 64 QAM</p> <p>HSPA+ Rel. 8: DL/UL up to 42/11.5 Mbps</p>   | <b>Carrier Connection</b> | ICMP Keep Alive, Traffic Watchdog, DDNS, Failover  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>WiFi Features</b>               | 802.11b/g/n (2.4GHz), 802.11a/n/ac (5.8 GHz)  | <b>Network Protocols</b>  | IPv4, IPv6, TCP, UDP, TCP/IP, ARP, ICMP, DHCP, HTTP, SNMP, FTP, DNS, Serial over IP, Modbus Slave (TCP/Serial), Load Balancer  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>WiFi Performance (3X3 MIMO)</b> | <table border="1"> <thead> <tr> <th>Rate</th> <th>Mode</th> <th>Tx(dBm)*</th> <th>Rx(dBm)</th> </tr> </thead> <tbody> <tr><td>6 Mbps</td><td>a</td><td>26</td><td>-94 ± 2</td></tr> <tr><td>54 Mbps</td><td>a</td><td>26</td><td>-80 ± 2</td></tr> <tr><td>1 Mbps</td><td>b</td><td>26</td><td>-95 ± 2</td></tr> <tr><td>11 Mbps</td><td>b</td><td>26</td><td>-90 ± 2</td></tr> <tr><td>6 Mbps</td><td>g</td><td>26</td><td>-94 ± 2</td></tr> <tr><td>54 Mbps</td><td>g</td><td>26</td><td>-80 ± 2</td></tr> <tr><td>MCS0</td><td>n (HT20)</td><td>26</td><td>-94 ± 2</td></tr> <tr><td>MCS7</td><td>n (HT20)</td><td>26</td><td>-76 ± 2</td></tr> <tr><td>MCS0</td><td>n (HT40)</td><td>26</td><td>-92 ± 2</td></tr> <tr><td>MCS7</td><td>n (HT40)</td><td>26</td><td>-73 ± 2</td></tr> <tr><td>MCS0</td><td>ac (VHT20)</td><td>26</td><td>-93 ± 2</td></tr> <tr><td>MCS8</td><td>ac (VHT20)</td><td>26</td><td>-71 ± 2</td></tr> <tr><td>MCS0</td><td>ac (VHT40)</td><td>26</td><td>-90 ± 2</td></tr> <tr><td>MCS9</td><td>ac (VHT40)</td><td>26</td><td>-67 ± 2</td></tr> <tr><td>MCS0</td><td>ac (VHT80)</td><td>26</td><td>-88 ± 2</td></tr> <tr><td>MCS9</td><td>ac (VHT80)</td><td>26</td><td>-66 ± 2</td></tr> </tbody> </table> <p>*Total Tx power in dBm for 3 chains</p> | Rate                      | Mode   | Tx(dBm)* | Rx(dBm) | 6 Mbps | a | 26 | -94 ± 2 | 54 Mbps | a | 26 | -80 ± 2 | 1 Mbps | b | 26 | -95 ± 2 | 11 Mbps | b | 26 | -90 ± 2 | 6 Mbps | g | 26 | -94 ± 2 | 54 Mbps | g | 26 | -80 ± 2 | MCS0 | n (HT20) | 26 | -94 ± 2 | MCS7 | n (HT20) | 26 | -76 ± 2 | MCS0 | n (HT40) | 26 | -92 ± 2 | MCS7 | n (HT40) | 26 | -73 ± 2 | MCS0 | ac (VHT20) | 26 | -93 ± 2 | MCS8 | ac (VHT20) | 26 | -71 ± 2 | MCS0 | ac (VHT40) | 26 | -90 ± 2 | MCS9 | ac (VHT40) | 26 | -67 ± 2 | MCS0 | ac (VHT80) | 26 | -88 ± 2 | MCS9 | ac (VHT80) | 26 | -66 ± 2 | <b>Security</b> | VPN, IPsec with IKE/ISAKMP; Multiple tunnel support (16); 3DES and up to 256-bit AES Encryption, VPN Tunneling L2TP, GRE, Open VPN, HTTPS, RADIUS |
| Rate                               | Mode  | Tx(dBm)*                  | Rx(dBm)  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| 6 Mbps                             | a   | 26                        | -94 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| 54 Mbps                            | a   | 26                        | -80 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| 1 Mbps                             | b   | 26                        | -95 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| 11 Mbps                            | b   | 26                        | -90 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| 6 Mbps                             | g   | 26                        | -94 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| 54 Mbps                            | g   | 26                        | -80 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS0                               | n (HT20)  | 26                        | -94 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS7                               | n (HT20)  | 26                        | -76 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS0                               | n (HT40)  | 26                        | -92 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS7                               | n (HT40)  | 26                        | -73 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS0                               | ac (VHT20)  | 26                        | -93 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS8                               | ac (VHT20)  | 26                        | -71 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS0                               | ac (VHT40)  | 26                        | -90 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS9                               | ac (VHT40)  | 26                        | -67 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS0                               | ac (VHT80)  | 26                        | -88 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| MCS9                               | ac (VHT80)  | 26                        | -66 ± 2  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>Serial Interface</b>            | RS232/485 Serial Data Port<br>RS232 Serial Console/Data Port  | <b>Firewall</b>           | NAT, NAT-T VPN Tunneling, Port Forwarding, VPN/GRE pass-through; Access Control Lists, DMZ   |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>Serial Baud Rate</b>            | 300bps to 921kbps   | <b>Management</b>         | Telnet, WebUI, SNMP V1/2/3, Wireless Upgrade (HTTP/FTP), AT Command Interface (Serial/Telnet), Microhard NMS Support, Data Usage Alerts, SSH   |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>Serial Port Service</b>         | Extensive Serial Port Support: TCP Server/Client / UDP Server/Client / Modbus / SMTP  | <b>Diagnostics</b>        | RSSI, Ec/No, Voltage, Temperature, Remote diagnostics, UDP Event Reporting, SMS Alerts, Netflow  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>Ethernet</b>                    | 4x LAN 10/100/1000, Auto - MDI/X IEEE 802.3<br>2x WAN 10/100/1000, Auto - MDI/X IEEE 802.3  | <b>Input Voltage</b>      | 7 - 30VDC<br>Passive PoE on WAN (optional)<br>Reverse polarity protection  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>I/O</b>                         | 2x Programmable Analog/Digital Inputs or 2x Digital Outputs   | <b>Connectors:</b>        | <p>Antenna 3x SMA Female (Cell, Div, GPS)<br/>3x RPSMA Female (WiFi)</p> <p>Data 6x RJ-45 (Ethernet)<br/>4 PIN Interlock (Vin, I/O)<br/>2x DB9 RS232</p> <p>USB Type A</p> <p>SIM 2x Nano SIM 1.8 / 3.0V (4FF)</p> |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>USB</b>                         | Type A USB 2.0  | <b>Environmental</b>      | <p>Operating Temperature -40°C to +85°C</p> <p>Humidity 5-95%, non-condensing</p>  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| <b>GPS</b>                         | TCP/UDP/Email Reporting, GpsGate, TAIP  | <b>Weight</b>             | Approx. 350 grams  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| GNSS Systems                       | GLONASS, BeiDou & Galileo   | <b>Dimensions</b>         | Approx. 5.05" x 3.0" x 1.2"<br>(128mm x 76mm x 30mm)   |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| GPS Protocols                      | NMEA 0183 V3.0  | <b>Approvals</b>          | FCC / IC<br>PTCRB<br>UL HazLoc<br>Carrier Specific Approvals   |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| Acquisition Sensitivity            | -145 dBm (Cold-start)   | <b>Order Options</b>      |  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| Tracking Sensitivity               | -160 dBm (Open Sky/Active-patch Antenna)  | <b>Model</b>              | BulletPlusAC   |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| Accuracy                           | <2m CEP-50 (Open sky, 1 Hz tracking)  |                           |  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| Standalone time to first fix       | 1s/29s/32s (hot/warm/cold)  |                           |  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |
| Total number of SVs                | ~55 SVs   |                           |  |          |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |        |   |    |         |         |   |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |          |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |      |            |    |         |                 |   |

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