



# Antennas

## DATA SHEET

### Low-band Bi-Sector™™ Array

BSA-S65R-B-H6



- Patented twin asymmetric beam 33° Bi-Sector™™ array phased arrays over a frequency range of (698-896 MHz), optimized to match existing cloverleaf (65°) deployments.
- 4 low band ports
- Single panel design supporting 2 beams
- Optimized beam shape for maximum LTE data throughput
- 3GPP/AISG 2.0 compliant
- Multi band applications – 700 MHz, 800 MHz
- Provides independent remote control of electrical downtilt for each beam for ease of optimization

## Overview

The CCI Low Band Bi-Sector™™ Antenna is an LTE optimized phased array that provides a total of four low band ports covering the 698 MHz to 896 MHz bands. Our patented bi-sector technology enables the creation of two asymmetric 33° beams each containing two low band ports. The antenna is capable of 2x2 MIMO. The beam shapes have been optimized for minimum overlap and crossover in order to minimize interference across sectors and lower soft handover losses. As such, the antenna array enables maximized data throughput for EVDO, UMTS and LTE networks.

The RET Low Band Bi-Sector™™ Antenna enables operators to remotely control the electrical down-tilt of the antenna in the field with sealed AISG compliant RET actuators. The CCI RET system is designed to meet the reliability, flexibility and efficiency requirements in a wide range of environments. The RET actuators are fully AISG compliant, software upgradeable, daisy chaining capable and fully weather resistant. The remote electrical capability allows independent adjustment of the low band ports each beam for easier optimization.

The single panel design of the antenna array offers the opportunity to reduce antenna count and directly replaces the footprint of an existing 65° antenna. The new coverage that matches the existing footprint minimizes the need for optimization and adjacent site changes, and allows for significant CAPEX and OPEX cost savings.

CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

## Applications

- Upgrade of data-throughput or capacity constrained sites
- Spectrum limited markets
- Deferral of new site builds or carrier adds
- Spectrum clearing and re-farming



# Antennas

## SPECIFICATIONS

### Low-band Bi-Sector™™ Array

BSA-S65R-B-H6

#### Electrical

| Ports                                | 4 x Low Band Ports for 698-896 MHz |                 |
|--------------------------------------|------------------------------------|-----------------|
|                                      | 698-806 MHz                        | 824-896 MHz     |
| Frequency Range                      | 698-806 MHz                        | 824-896 MHz     |
| Gain                                 | 16.4 dBi                           | 17.3 dBi        |
| Azimuth Beamwidth (-3dB)             | 34°                                | 32°             |
| Elevation Beamwidth (-3dB)           | 11.7°                              | 10.3°           |
| Electrical Downtilt                  | 2° to 12°                          | 2° to 12°       |
| Elevation Sidelobes (1st Upper)      | < -18 dB                           | < -18 dB        |
| Front-to-Back Ratio @180°            | > 30 dB                            | > 30 dB         |
| Cross-Polar Discrimination (at Peak) | > 24 dB                            | > 25 dB         |
| Cross-Polar Port-to-Port Isolation   | > 25 dB                            | > 25 dB         |
| Co-Polar Port-to-Port Isolation      | > 22 dB*                           | > 19 dB         |
| Voltage Standing Wave Ratio (VSWR)   | < 1.5:1                            | < 1.5:1         |
| Passive Intermodulation (2x20W)      | ≤ -153 dBc                         | ≤ -153 dBc      |
| Input Power Continuous Wave (CW)     | 500 watts                          | 500 watts       |
| Polarization                         | Dual Linear 45°                    | Dual Linear 45° |
| Input Impedance                      | 50 ohms                            | 50 ohms         |
| Lightning Protection                 | DC Ground                          | DC Ground       |

\*>22 dB from 746-757 MHz; >16 dB elsewhere

| Ports  | 4 x Low Band Ports for 698-896 MHz |             |
|--|------------------------------------|-------------|
|  | 698-806 MHz                        | 824-896 MHz |
| Frequency Range                              | 698-806 MHz                        | 824-896 MHz |
| Gain over all Tilts (dBi)                    | 16.4                               | 17.3        |
| Gain over all Tilts Tolerance (dB)           | 0.8                                | 0.7         |
| Gain at Low-tilt (dBi)                       | 16.5                               | 17.5        |
| Gain at Mid-tilt (dBi)                       | 16.4                               | 17.4        |
| Gain at High-tilt (dBi)                      | 16.2                               | 17.0        |
| Azimuth Beamwidth Tolerance (°)              | 1.8                                | 1.0         |
| Elevation Beamwidth Tolerance (°)            | 0.9                                | 0.6         |
| Electrical Downtilt Deviation (°)            | 0.9                                | 1.0         |
| Front-to-Back Ratio over ± 20° (dB)          | 20.3                               | 28.3        |
| First Upper Sidelobe Suppression (dB)        | 15.8                               | 14.9        |
| Upper Sidelobe Suppression, peak to 20° (dB) | 17.5                               | 16.1        |

\*Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.66  
All Specifications are subject to change without notice.

#### Mechanical

|                            |                                      |
|----------------------------|--------------------------------------|
| Dimensions (LxWxD)         | 72.0x28.5x9.7 in (1828x723x245 mm)   |
| Survival Wind Speed        | > 150 mph (> 241 kph)                |
| Front Wind Load            | 438 lbs (1947 N) @ 100 mph (161 kph) |
| Side Wind Load             | 175 lbs (778 N) @ 100 mph (161 kph)  |
| Equivalent Flat Plate Area | 17.1 ft² (1.6 m²)                    |
| Weight *                   | 81.4 lbs (36.9 kg)                   |
| RET System Weight          | 3.3 lbs (1.5 kg)                     |
| Connector                  | 4 x 7-16 DIN female long neck        |
| Mounting Pole              | 2 to 5 in (5 to 12 cm)               |

\*Weight excludes mounting and RET



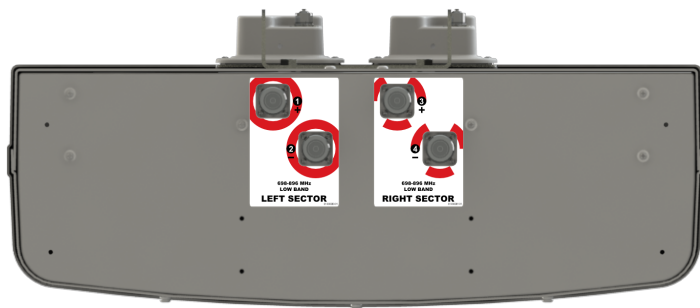
# Antennas

## SPECIFICATIONS

### Low-band Bi-Sector™™ Array

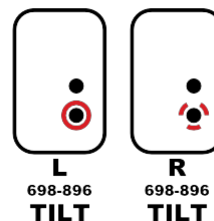
BSA-S65R-B-H6

Bottom View



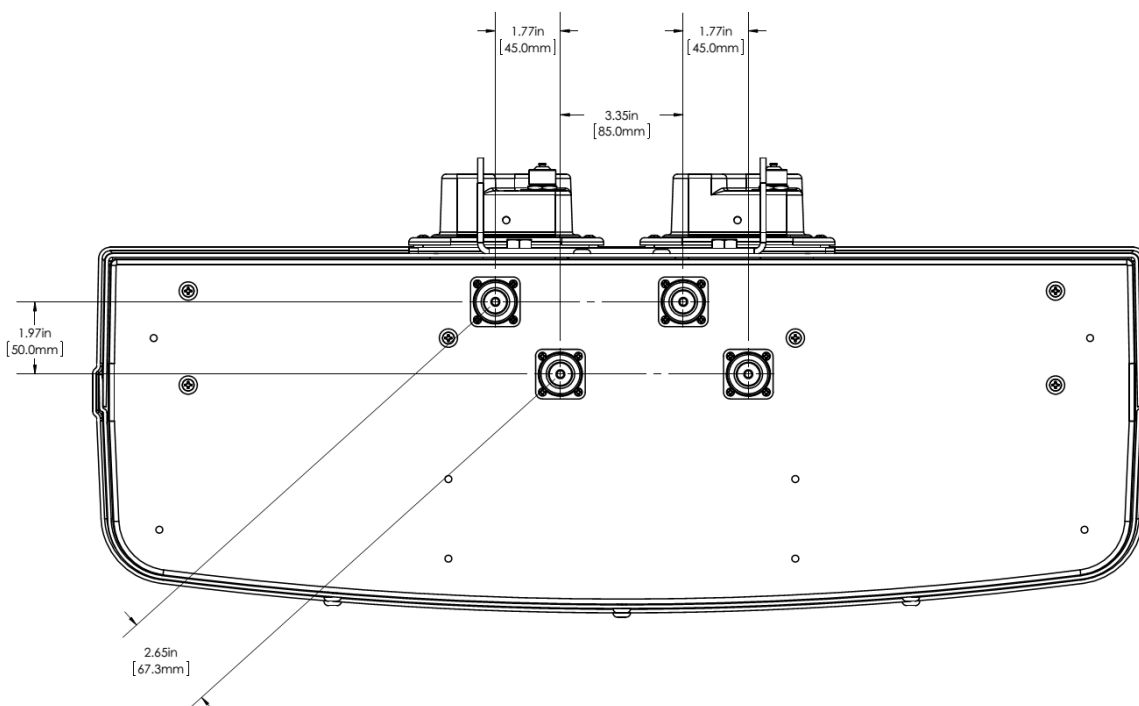
RET Connection Diagram

**CONNECT RET ACTUATORS  
AS SHOWN BELOW**



Mechanical

Connector Spacing





# Antennas

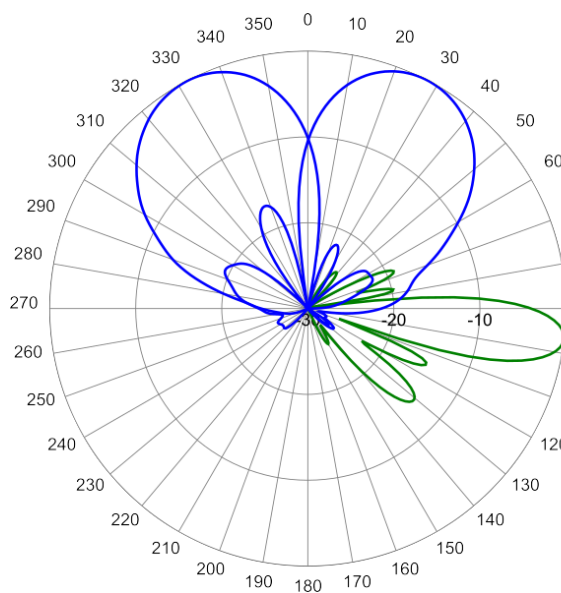
## SPECIFICATIONS

### Low-band Bi-Sector™™ Array

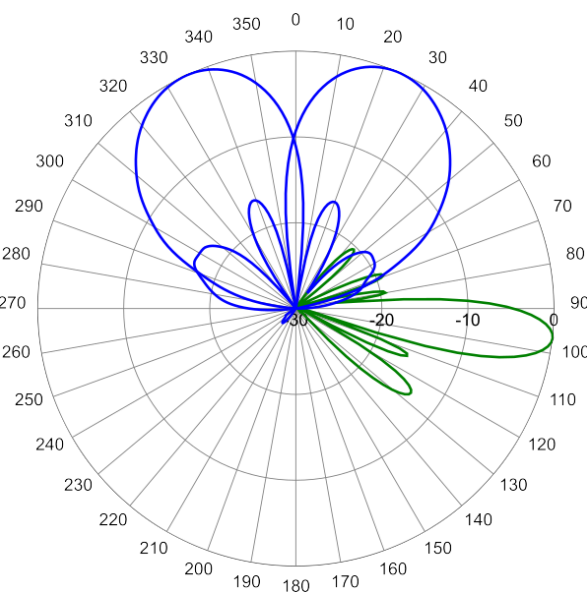
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#### Typical Antenna Patterns

For detailed information on additional antenna patterns, contact customer support at [support@cciprducts.com](mailto:support@cciprducts.com)



761 MHz Azimuth / Elevation 7°



849 MHz Azimuth / Elevation 7°



# Antennas

## ORDERING

### Low-band Bi-Sector™™ Array

BSA-S65R-B-H6

#### Parts & Accessories

|                          |   |
|--------------------------|---|
| <b>BSA-S65R-B-H6</b>     | Six foot (1.8 m), four port, Bi-Sector™ antenna with left and right azimuth beams covering 698-896 MHz. |
| <b>BSA-S65R-B-H6-K</b>   | Antenna kit with 2 factory installed RET actuators and MBK-01 mounting bracket                          |
| <b>MBK-01</b>            | Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment                         |
| <b>BSA-RET200</b>        | Remote electrical tilt actuator   |
| <b>QPA-CBK-AG-RRU</b>    | QuadPort antenna to RRU AISG cable kit  |
| <b>QPA-CBK-RA-AG-RRU</b> | QuadPort antenna to RRU AISG right angle cable kit  |



# Antennas

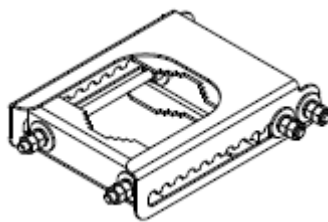
## ACCESSORIES

### Mounting Bracket Kit

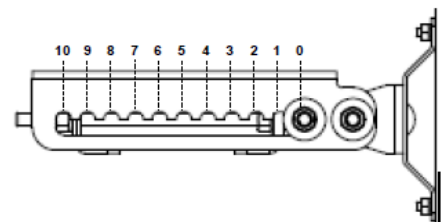
MBK-01

#### Mechanical

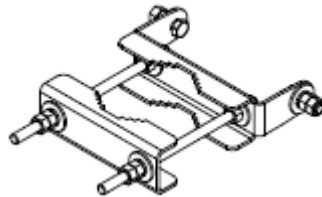
|                            |                        |
|----------------------------|------------------------|
| Weight                     | 12.6 lbs (5.7 kg)      |
| Hinge Pitch                | 47.25 in (1200 mm)     |
| Mounting Pole Dimension    | 2 to 5 in (5 to 12 cm) |
| Fastener Size              | M12                    |
| Installation Torque        | 40 ft·lb (54 N·m)      |
| Mechanical Tilt Adjustment | 0° - 10°               |



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket



# Antennas

## ACCESSORIES

### Remote Electrical Tilt Actuator (RET)

BSA-RET200

#### General Specifications

|                   |                 |
|-------------------|-----------------|
| Part Number       | BSA-RET200      |
| Protocols         | AISG 2.0        |
| RET Type          | Type 1          |
| Adjustment Cycles | >10,000 cycles  |
| Tilt Accuracy     | $\pm 0.1^\circ$ |
| Temperature Range | -40° C to 70° C |

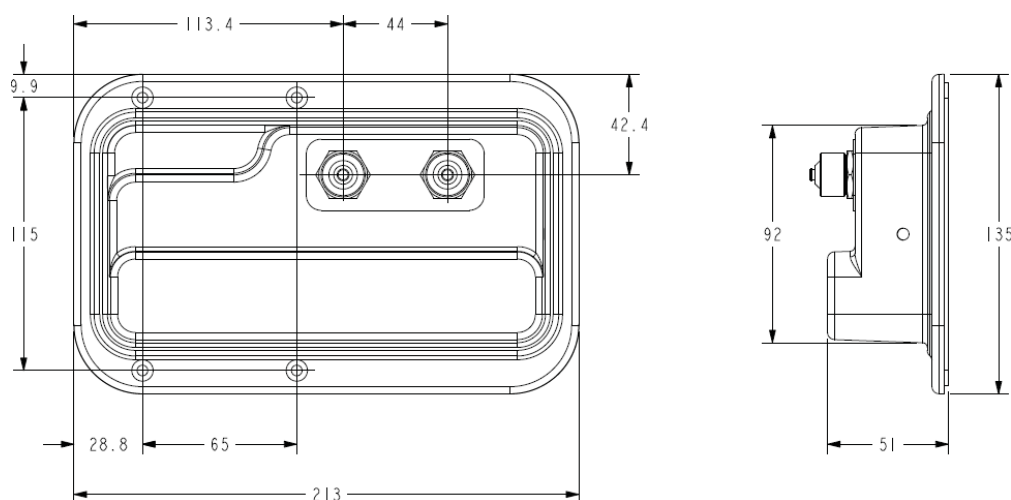
#### Electrical

|                          |                              |
|--------------------------|------------------------------|
| Data Interface Signal    | DC                           |
| Input Voltage            | 10-30 Vdc                    |
| Current Consumption Tilt | 120 mA at $V_{in}=24$        |
| Current Consumption Idle | 55 mA at $V_{in}=24$         |
| Hardware Interface       | AISG-RS 485 A/B              |
| Input Connector          | Male 1 × 8 pin Daisy Chain   |
| Output Connector         | Female 1 × 8 pin Daisy Chain |

#### Mechanical

|                    |                                 |
|--------------------|---------------------------------|
| Dimensions (LxWxD) | 8.0x5.0x2.0 in. (213x135x51 mm) |
| Housing            | ASA/ABS/Aluminum                |
| Weight             | 1.7 lbs (0.75 kg)               |

ASA= Acrylic Styrene Acrylonitrile  
ABS=Acrylonitrile Butadiene Styrene





# Antennas

## ACCESSORIES

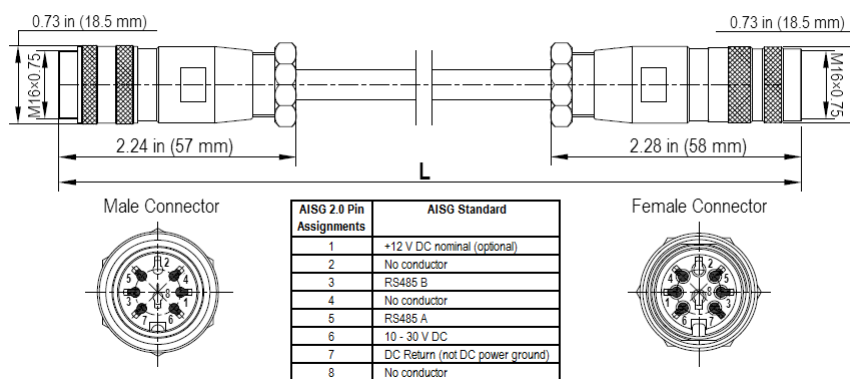
### Quad Port AISG Cable Kit

QPA-CBK-AG-RRU

#### Electrical/Mechanical/Environmental Specifications

|                              | RET to RET Cables  | RRU to Antenna Cables |
|------------------------------|--|-----------------------|
| Individual Cable Part Number | AISGC-M-F-18   | AISGC-M-F-10FT        |
| Cable style                  | UL2464   |                       |
| Protocol                     | AISG 1.1 and AISG 2.0  |                       |
| Maximum voltage              | 300 V  |                       |
| Rated current                | 5 A at 104° F (40° C)  |                       |
| Temperature Range            | -40° to 80° C  |                       |
| Flammability                 | UL 1581 VW-1   |                       |
| Ingress Protection           | IEC 60529:2001, IP67   |                       |
| Tightening torque            | Hand tighten only $\approx$ 1.84 ft-lbs (2.5 N·m)                  |                       |
| Construction                 | Shielded (Tinned Copper Braid)                                     |                       |
| Braid coverage               | 85%  |                       |
| Jacket Material              | Matte Polyurethane (Black)   |                       |
| Conductors                   | 1 twisted pair - 24 AWG<br>3 conductors - 19 AWG<br>AWM style 2464 |                       |
| Cable Diameter               | 0.307 in (7.8 mm)  |                       |
| Minimum bend radius          | 3.9 in (100 mm)  |                       |
| Connectors                   | 2 x 8 pin IEC 60130-9 Straight male/straight female                |                       |
| Length                       | 18-20 in (457-508)   | 120 in (3048 mm)      |
| Weight                       | 0.27 lbs (0.12 kg)   | 0.69 lbs (0.31 kg)    |
| Cables per kit               | 1  | 2                     |

#### Mechanical Specifications



AISG-Male to AISG-Female Jumper Cable





# Antennas

## ACCESSORIES

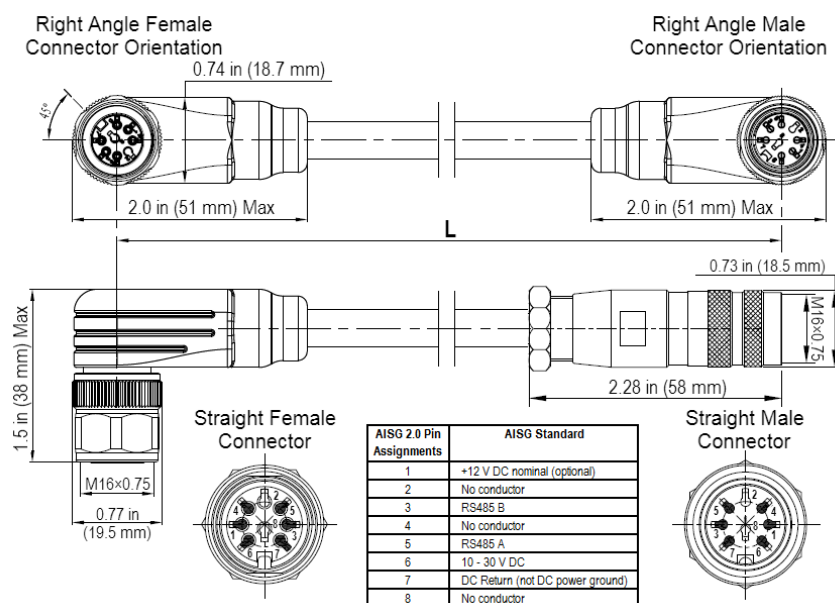
### Quad Port AISG Cable Kit

QPA-CBK-RA-AG-RRU

#### Electrical/Mechanical/Environmental Specifications

|                              | RET to RET Cables  | RRU to Antenna Cables                                     |
|------------------------------|--|---|
| Individual Cable Part Number | AISGC-MRA-FRA-20   | AISGC-M-FRA-10FT  |
| Cable style                  | UL2464   |   |
| Protocol                     | AISG 1.1 and AISG 2.0  |   |
| Maximum voltage              | 300 V  |   |
| Rated current                | 5 A at 104° F (40° C)  |   |
| Temperature Range            | -40° to 80° C  |   |
| Flammability                 | UL 1581 VW-1   |   |
| Ingress Protection           | IEC 60529:2001, IP67   |   |
| Tightening torque            | Hand tighten only $\approx$ 1.84 ft-lbs (2.5 N·m)                  |   |
| Construction                 | Shielded (Tinned Copper Braid)                                     |   |
| Braid coverage               | 85%  |   |
| Jacket Material              | Matte Polyurethane (Black)   |   |
| Conductors                   | 1 twisted pair - 24 AWG<br>3 conductors - 19 AWG<br>AWM style 2464 |   |
| Cable Diameter               | 0.307 in (7.8 mm)  |   |
| Minimum bend radius          | 3.9 in (100 mm)  |   |
| Connectors                   | 2 x 8 pin IEC 60130-9<br>Right angle male/right angle female       | 2 x 8 pin IEC 60130-9<br>Straight male/right angle female |
| Length                       | 20 in (508 mm)   | 120 in (3048 mm)  |
| Weight                       | 0.23 lbs (0.10 kg)   | 0.77 lbs (0.35 kg)  |
| Cables per kit               | 1  | 2   |

#### Mechanical Specifications



Right Angle to Right Angle and Right Angle to Straight Jumper Cable



# Antennas

## STANDARDS & CERTIFICATIONS

### Low-band Bi-Sector™™ Array

BSA-S65R-B-H6

#### Standards & Compliance

|                      |  |
|----------------------|--|
| <b>Safety</b>        | EN 60950-1, UL 60950-1   |
| <b>Emission</b>      | EN 55022   |
| <b>Immunity</b>      | EN 55024   |
| <b>Environmental</b> | IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-5, IEC 60068-2-6, IEC-60068-2-11, IEC 60068-2-14, IEC 60068-2-18, IEC 60068-2-27, IEC 60068-2-29, IEC 60068-02-30, IEC 60068-2-52, IEC 60068-2-64, GR-63-CORE 4.3.1, EN 60529, IP 24 |

#### Certifications

Antenna Interface Standards Group (AISG), Federal Communication Commission (FCC) Part 15 Class B, CE, CSA US, ISO 9001



**CCI** Communication Components Inc.  
EXTENDING WIRELESS PERFORMANCE