

- Four and a half foot (1.4 m), Multiband, six port antenna with a 45° azimuth beamwidth covering 698-896 MHz and 1695-2400 MHz frequencies
- Four wide high band ports covering 1695-2400 MHz and two wide low band ports covering 698-896 MHz in a single antenna
- New enclosure with <15.5" (394 mm) width, narrowest enclosure in the industry for a 45° Multiband Hexport Antenna
- Full Spectrum Compliance for WCS and AWS-3 frequencies and upcoming Band 14 Operations
- LTE Optimized FBR and SPR performance, providing for an efficient use of valuable radio capacity
- LTE Optimized Boresight and Sector XPD and USL performance, essential for LTE Performance
- Exceeds minimum PIM performance requirements
- Equipped with 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Ordering options for 2 or 3 field replaceable, integrated AISG 2.0 compliant Remote Electrical Tilt (RET) controllers
- Ordering options for External RET Controllers (Type 1) or Internally Integrated RET Controllers (Type 17)

### Overview

The CCI HexPort multiband array is a six port antenna, with four wide high band ports covering 1695-2400 MHz and two wide low band ports covering 698-896 MHz. The CCI HexPort provides the capability to deploy 4x4 Multiple-input Multiple-output (MIMO) in the high band and 2x2 Multiple-input Multiple-output in the low band. The CCI HexPort allows separate tilt control between the low band ports and high band ports. With the use of three (3) RET controllers, the paired high band ports can be tilted independently, enabling maximum flexibility in network deployment.

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

### Applications

- 4x4 MIMO for the high band and 2x2 MIMO for the low band
- Ready for Network Standardization on 4.3-10 DIN connectors
- With CCI's multiband antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs



## HexPort Multi-Band Antenna

HPA45R-BU5A

### SPECIFICATIONS

#### Electrical

| Ports                              | 2 × Low Band Ports for 698-896 MHz |                 |
|------------------------------------|------------------------------------|-----------------|
| Frequency Range                    | 698-806 MHz                        | 824-896 MHz     |
| Gain <sup>1</sup>                  | 15.4 dBi                           | 16.1 dBi        |
| Gain (Average) <sup>2</sup>        | 14.8 dBi                           | 15.4 dBi        |
| Azimuth Beamwidth (-3dB)           | 52°                                | 47°             |
| Elevation Beamwidth (-3dB)         | 16.8°                              | 14.7°           |
| Electrical Downtilt                | 2° to 16°                          | 2° to 16°       |
| Elevation Sidelobes (1st Upper)    | < -17 dB                           | < -18 dB        |
| Front-to-Back Ratio @180°          | > 32 dB                            | > 32 dB         |
| Front-to-Back Ratio over ±20°      | > 30 dB                            | > 30 dB         |
| Cross-Polar Discrimination at Peak | > 25 dB                            | > 25 dB         |
| Cross-Polar Port-to-Port Isolation | > 25 dB                            | > 25 dB         |
| Voltage Standing Wave Ratio (VSWR) | < 1.5:1                            | < 1.5:1         |
| Passive Intermodulation (2×20W)    | ≤ -150 dBc                         | ≤ -150 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       |

<sup>1</sup>Peak gain across sub-bands.

<sup>2</sup>Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.

| Ports                              | 4 × High Band Ports for 1695-2400 MHz |                 |                 |                 |
|------------------------------------|---------------------------------------|-----------------|-----------------|-----------------|
| Frequency Range                    | 1695-1880 MHz                         | 1850-1990 MHz   | 1920-2180 MHz   | 2300-2400 MHz   |
| Gain <sup>1</sup>                  | 18.6 dBi                              | 19.2 dBi        | 19.6 dBi        | 20.0 dBi        |
| Gain (Average) <sup>2</sup>        | 17.7 dBi                              | 18.5 dBi        | 18.9 dBi        | 18.9 dBi        |
| Azimuth Beamwidth (-3dB)           | 45°                                   | 44°             | 43°             | 43°             |
| Elevation Beamwidth (-3dB)         | 6.7°                                  | 6.1°            | 5.7°            | 5.0°            |
| Electrical Downtilt                | 2° to 10°                             | 2° to 10°       | 2° to 10°       | 2° to 10°       |
| Elevation Sidelobes (1st Upper)    | < -17 dB                              | < -17 dB        | < -17 dB        | < -17 dB        |
| Front-to-Back Ratio @180°          | > 30 dB                               | > 33 dB         | > 33 dB         | > 35 dB         |
| Front-to-Back Ratio over ±20°      | > 28 dB                               | > 30 dB         | > 30 dB         | > 30 dB         |
| Cross-Polar Discrimination at Peak | > 20 dB                               | > 20 dB         | > 22 dB         | > 25 dB         |
| Cross-Polar Port-to-Port Isolation | > 25 dB                               | > 25 dB         | > 25 dB         | > 25 dB         |
| Voltage Standing Wave Ratio (VSWR) | < 1.5:1                               | < 1.5:1         | < 1.5:1         | < 1.5:1         |
| Passive Intermodulation (2×20W)    | ≤ -150 dBc                            | ≤ -150 dBc      | ≤ -150 dBc      | ≤ -150 dBc      |
| Input Power Continuous Wave (CW)   | 300 watts                             | 300 watts       | 300 watts       | 300 watts       |
| Polarization                       | Dual Linear 45°                       | Dual Linear 45° | Dual Linear 45° | Dual Linear 45° |
| Input Impedance                    | 50 ohms                               | 50 ohms         | 50 ohms         | 50 ohms         |
| Lightning Protection               | DC Ground                             | DC Ground       | DC Ground       | DC Ground       |

<sup>1</sup>Peak gain across sub-bands.

<sup>2</sup>Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.



SPECIFICATIONS

HexPort Multi-Band Antenna

HPA45R-BU5A

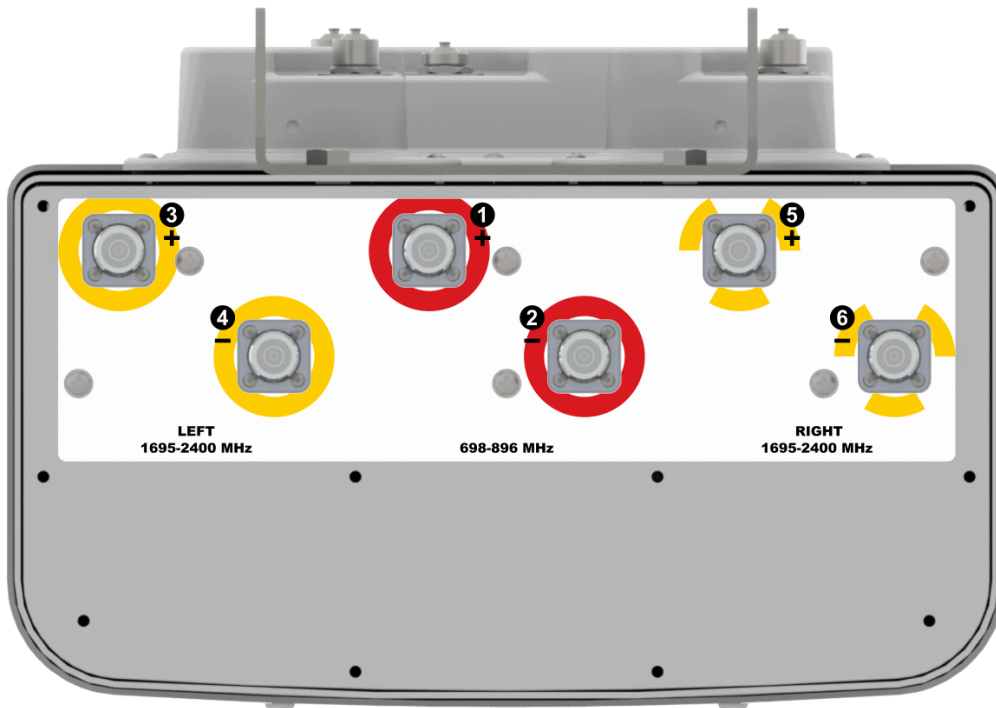
Mechanical

|                            |   |
|----------------------------|---|
| Dimensions (LxWxD)         | 55.4x15.4x8.2 in (1407x391x208 mm)        |
| Survival Wind Speed        | > 150 mph (> 241 kph)                     |
| Front Wind Load            | 189 lbs (842 N) @ 100 mph (161 kph)       |
| Side Wind Load             | 112 lbs (498 N) @ 100 mph (161 kph)       |
| Equivalent Flat Plate Area | 7.4 ft <sup>2</sup> (0.7 m <sup>2</sup> ) |
| Weight*                    | 46.3 lbs (21.0 kg)                        |
| RET Weight                 | 5.0 lbs (2.3 kg) for three RET's          |
| RET Weight                 | 3.3 lbs (1.5 kg) for two RET's            |
| Connector                  | 6 x 4.3-10 female                         |
| Mounting Pole              | 2 to 5 in (5 to 12 cm)                    |

\* Weight excludes mounting and RET

Bottom View

HPA45R-BU5A





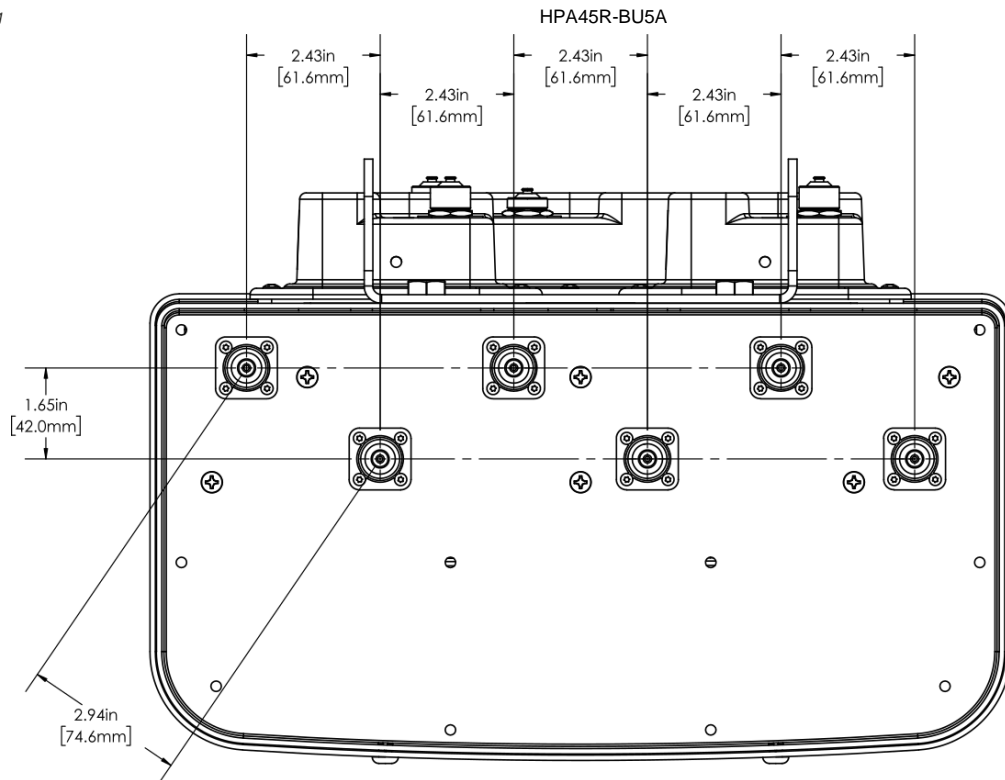
### HexPort Multi-Band Antenna

HPA45R-BU5A

#### SPECIFICATIONS

##### Mechanical

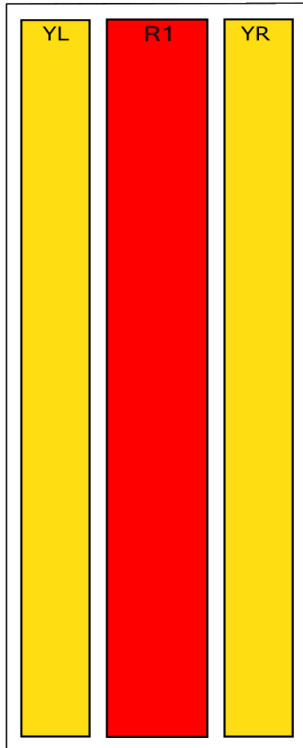
###### Connector Spacing



Mechanical

HPA45R-BU5AA Element and RET configuration (Type 1 External RET)

**Top of antenna  
Viewed from rear**

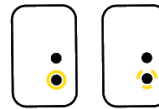


**RET placement  
as view from rear  
of antenna**

**Top of antenna**



698-896  
Ports 1, 2  
(R1)



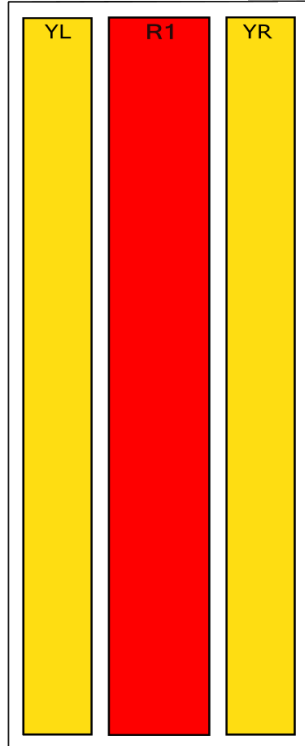
Left Right  
1695-2400 1695-2400  
Ports 3, 4 Ports 5, 6  
(YL) (YR)

| Array | Ports | Freq (MHz) | Ports controlled by common RET |
|-------|-------|------------|--------------------------------|
| R1    | 1, 2  | 698-896    | 1, 2                           |
| YL    | 3, 4  | 1695-2400  | 3, 4                           |
| YR    | 5, 6  | 1695-2400  | 5, 6                           |

Mechanical

HPA45R-BU5AB Element and RET configuration (Type 1 External RET)

**Top of antenna  
Viewed from rear**



**RET placement  
as view from rear  
of antenna**

**Top of antenna**



698-896  
Ports 1, 2  
(R1)



Left & Right  
1695-2400  
Ports 3, 4, 5, 6  
(YL & YR)

| Array | Ports | Freq (MHz) | Ports controlled by common RET |
|-------|-------|------------|--------------------------------|
| R1    | 1, 2  | 698-896    | 1, 2                           |
| YL    | 3, 4  | 1695-2400  | 3, 4, 5, 6                     |
| YR    | 5, 6  | 1695-2400  |                                |



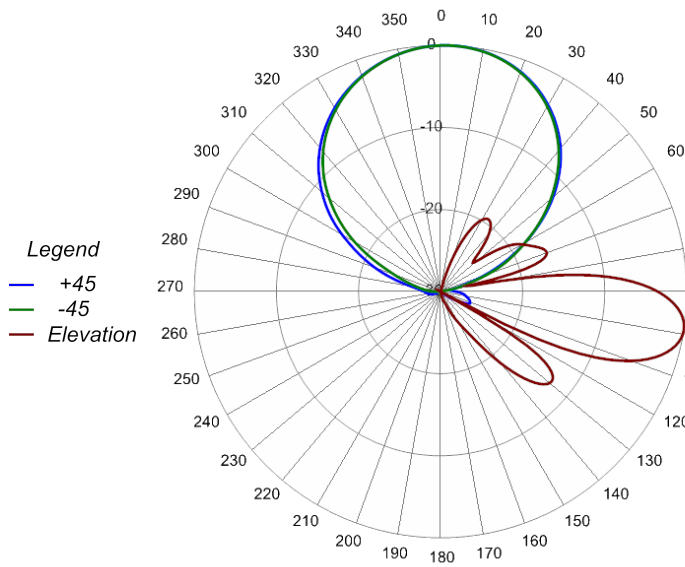
HexPort Multi-Band Antenna

HPA45R-BU5A

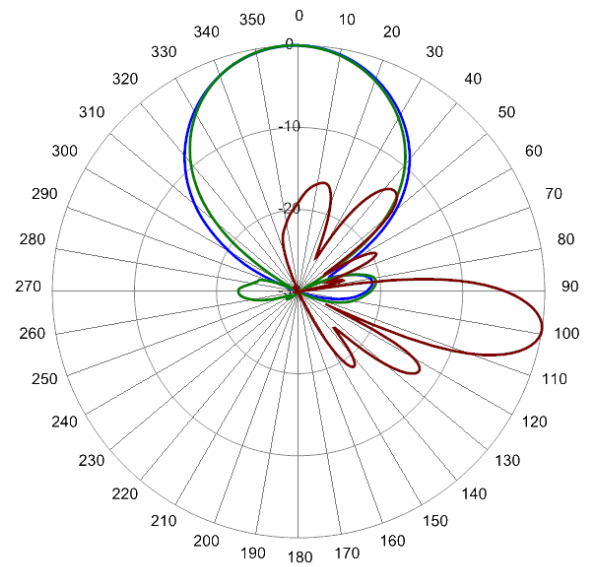
SPECIFICATIONS

Typical Antenna Patterns

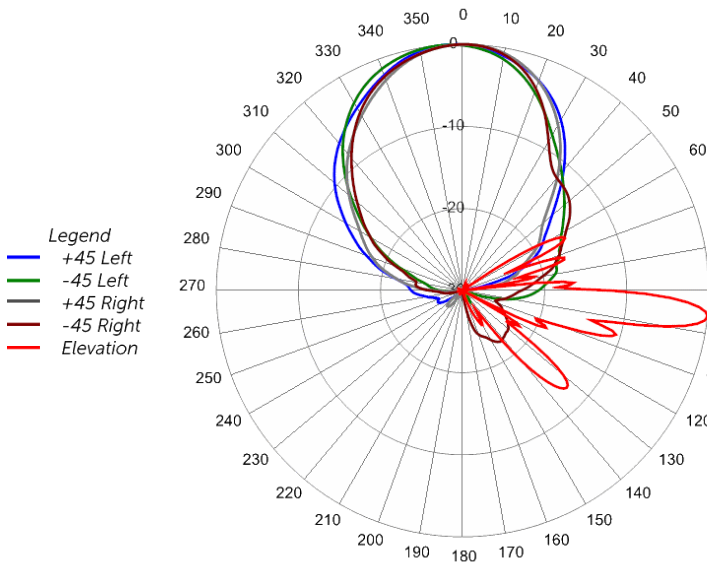
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com



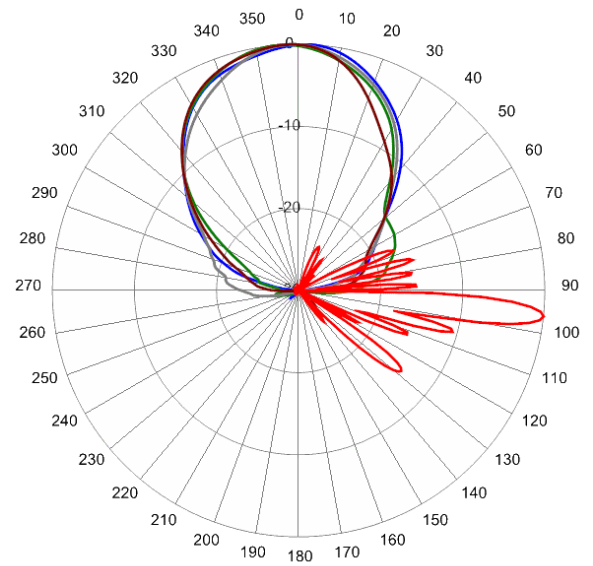
734 MHz Azimuth with Elevation 9°



860 MHz Azimuth with Elevation 9°



1850 MHz Azimuth with Elevation 6°



2110 MHz Azimuth with Elevation 6°



Parts & Accessories

|                          |  |
|--------------------------|--|
| <b>HPA45R-BU5AA-K</b>    | Four and a half foot (1.4 m) HexPort antenna with 45° azimuth beamwidth, 4.3-10 female connectors, 3 factory installed BSA-RET200 RET actuators (Type 1 external) and MBK-02 mounting bracket  |
| <b>HPA45R-BU5AB-K</b>    | Four and a half foot (1.4 m) HexPort antenna with 45° azimuth beamwidth, 4.3-10 female connectors, 2 factory installed BSA-RET200 RET actuators (Type 1 external) and MBK-02 mounting bracket  |
| <b>HPA45R-BU5AC-K</b>    | Four and a half foot (1.4 m) HexPort antenna with 45° azimuth beamwidth, 4.3-10 female connectors, 3 factory installed BSA-RET400 RET actuators (Type 17 internal) and MBK-02 mounting bracket |
| <b>HPA45R-BU5AD-K</b>    | Four and a half foot (1.4 m) HexPort antenna with 45° azimuth beamwidth, 4.3-10 female connectors, 2 factory installed BSA-RET400 RET actuators (Type 17 internal) and MBK-02 mounting bracket |
| <b>MBK-02</b>            | Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment  |
| <b>BSA-RET200</b>        | Type 1 remote electrical tilt actuator   |
| <b>BSA-RET400</b>        | Type 17 remote electrical tilt actuator  |
| <b>TPA-CBK-AG-RRU</b>    | HexPort antenna with 3 RET to RRU AISG cable kit   |
| <b>DPA-CBK-RA-AG-RRU</b> | HexPort antenna with 3 RET to RRU AISG right angle cable kit   |
| <b>CBK-AG-RRU-002</b>    | HexPort antenna with 2 RET to RRU AISG cable kit   |
| <b>CBK-RA-AG-RRU-002</b> | HexPort antenna with 2 RET to RRU AISG right angle cable kit   |



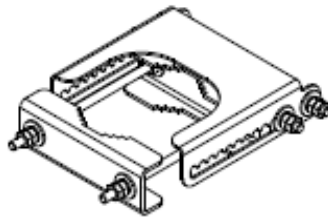


Mounting Bracket Kit

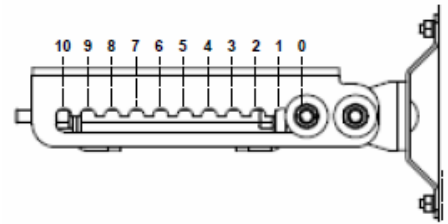
MBK-02

Mechanical

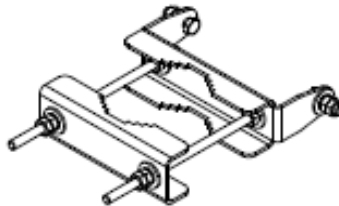
|                            |                        |
|----------------------------|------------------------|
| Weight                     | 9.8 lbs (4.4 kg)       |
| Hinge Pitch                | 31.5 in (800 mm)       |
| Mounting Pole Dimension    | 2 to 5 in (5 to 12 cm) |
| Fastener Size              | M10                    |
| Installation Torque        | 15 ft-lbs (20 N·m)     |
| Mechanical Tilt Adjustment | 0° - 10°               |



MBK-02 Top Adjustable Bracket



MBK-02 Top Adjustable Bracket Side View



MBK-02 Bottom Fixed Bracket



### 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     | ±0.1°           |
| Temperature Range | -40° C to 70° C |

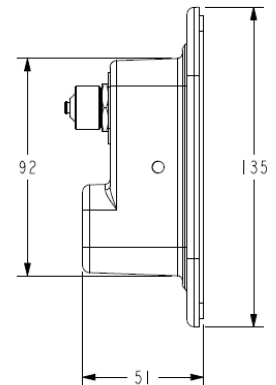
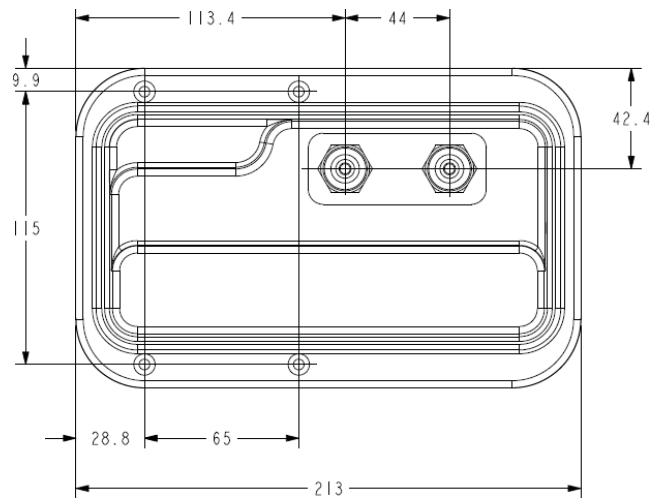
#### Electrical

|                          |                              |
|--------------------------|------------------------------|
| 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





Internal Remote Electrical Tilt (iRET)

BSA-RET400

General Specifications

|                   |                 |
|-------------------|-----------------|
| Part Number       | BSA-RET400      |
| Protocols         | AISG 2.0        |
| RET Type          | Type 17         |
| Adjustment Cycles | >10,000 cycles  |
| Tilt Accuracy     | ±0.1°           |
| Temperature Range | -40° C to 70° C |

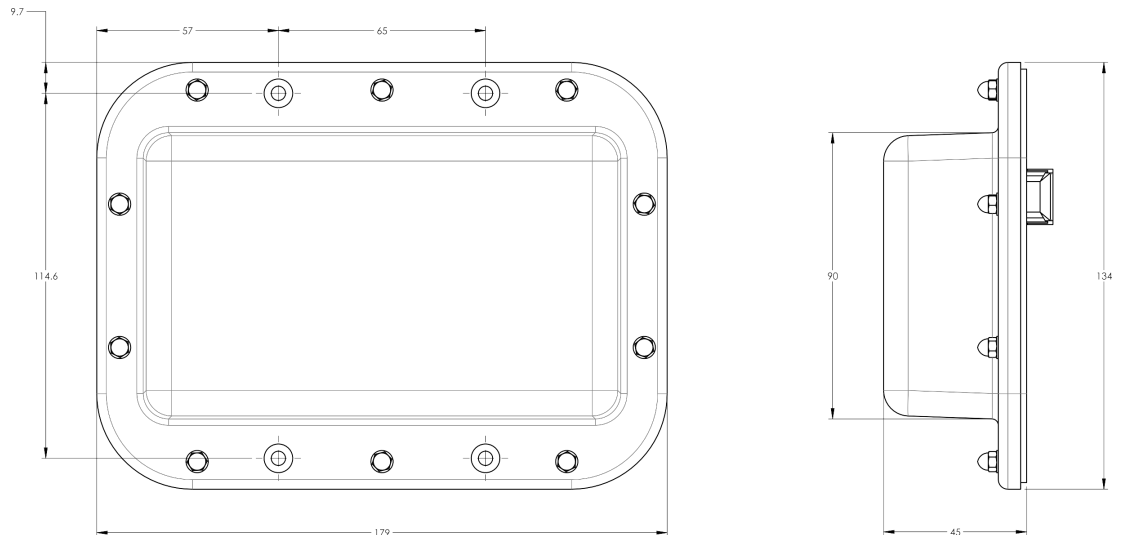
Electrical

|                          |                                    |
|--------------------------|------------------------------------|
| Data Interface Signal    | DC                                 |
| Input Voltage            | 10-30 Vdc                          |
| Current Consumption Tilt | 100 mA at $V_{in}=24$ (500 mA MAX) |
| Current Consumption Idle | 10 mA at $V_{in}=24$               |

Mechanical

|                    |                                 |
|--------------------|---------------------------------|
| Dimensions (LxWxD) | 7.0x5.3x1.8 in. (179x134x45 mm) |
| Housing            | ASA/ABS/Aluminum                |
| Weight             | 1.3 lbs (0.6 kg)                |

ASA= Acrylic Styrene Acrylonitrile  
ABS=Acrylonitrile Butadiene Styrene



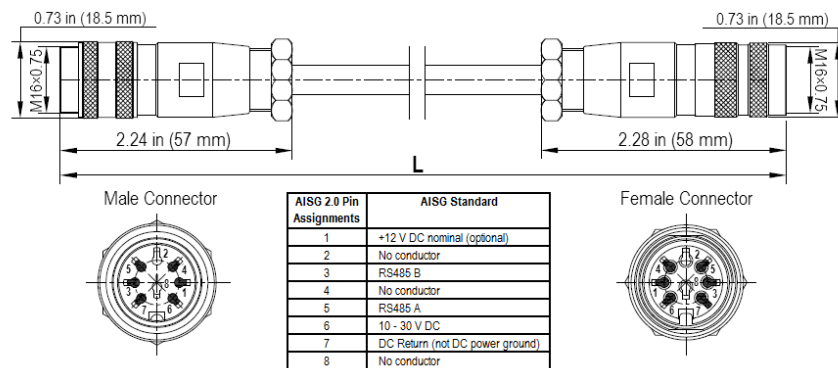


AISG Cable Kit

Electrical/Mechanical/Environmental Specifications

|                              | RET to RET Cables  |                    | RRU to Antenna Cables |
|------------------------------|--|--------------------|-----------------------|
| Individual Cable Part Number | AISGC-M-F-60   | AISGC-M-F-27       | 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 ≈ 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                       | 60 in (1525 mm)  | 27 in (686 mm)     | 120 in (3048 mm)      |
| Weight                       | 0.44 lbs (0.20 kg)   | 0.33 lbs (0.15 kg) | 0.69 lbs (0.31 kg)    |
| Cables per kit               | 1  | 1                  | 2                     |

Mechanical Specifications

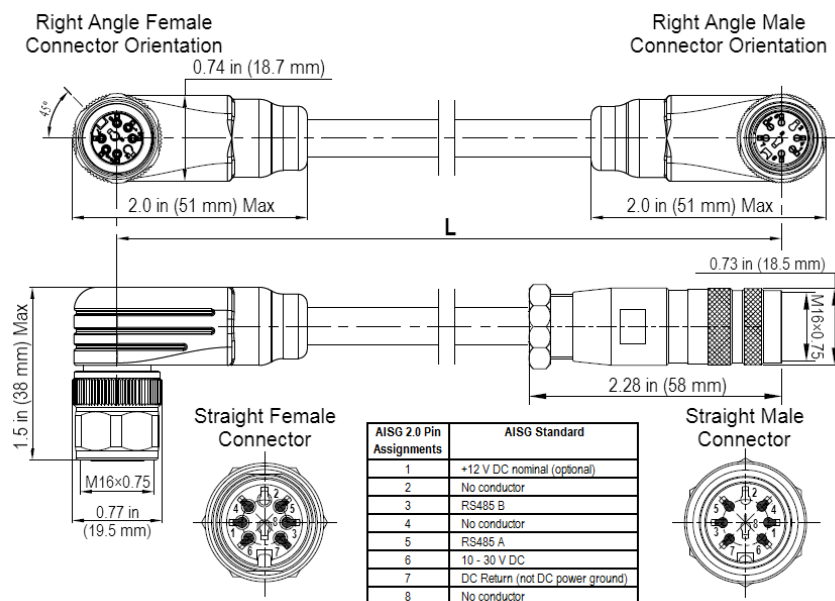


AISG-Male to AISG-Female Jumper Cable

Electrical/Mechanical/Environmental Specifications

|                              | RET to RET Cables  | RRU to Antenna Cables                                     |
|------------------------------|--|---|
| Individual Cable Part Number | AISGC-MRA-FRA-36   | 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 ≈ 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                       | 36 in (914 mm)   | 120 in (3048 mm)  |
| Weight                       | 0.23 lbs (0.10 kg)   | 0.77 lbs (0.35 kg)  |
| Cables per kit               | 2  | 2   |

Mechanical Specifications



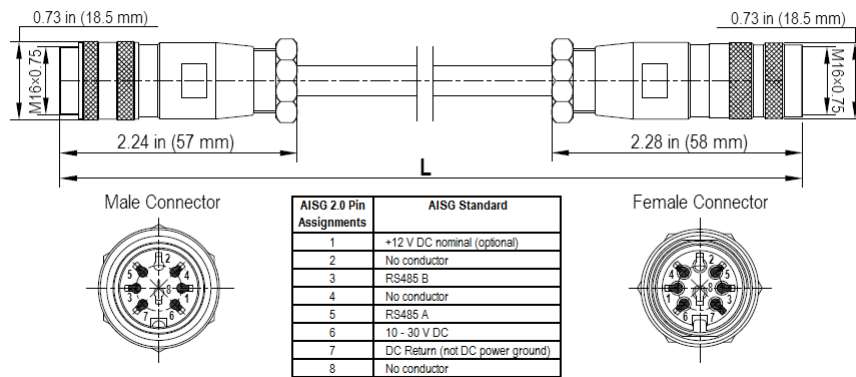
Right Angle to Right Angle and Right Angle to Straight Jumper Cable



Electrical/Mechanical/Environmental Specifications

|                              | RET to RET Cables  | RRU to Antenna Cables |
|------------------------------|--|-----------------------|
| Individual Cable Part Number | AISGC-M-F-34   | 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 ≈ 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                       | 34 in (864 mm)   | 120 in (3048 mm)      |
| Weight                       | 0.33 lbs (0.15 kg)   | 0.69 lbs (0.31 kg)    |
| Cables per kit               | 1  | 2                     |

Mechanical Specifications

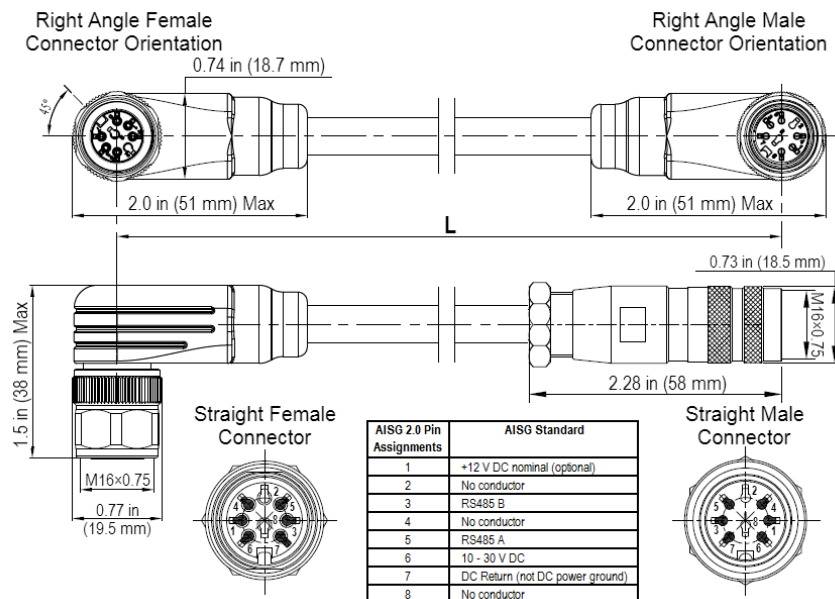


AISG-Male to AISG-Female Jumper Cable

Electrical/Mechanical/Environmental Specifications

|                              | RET to RET Cables  | RRU to Antenna Cables                                     |
|------------------------------|--|---|
| Individual Cable Part Number | AISGC-MRA-FRA-31   | 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 ≈ 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                       | 31 in (787 mm)   | 120 in (3048 mm)  |
| Weight                       | 0.25 lbs (0.11 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



STANDARDS & CERTIFICATIONS

HexPort Multi-Band Antenna

HPA45R-BU5A

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

