



# Antennas

MultiPort

Series

DATA SHEET

## TriBand Antenna

HPA65R-KE4A



- Four foot (1.2 m), TriBand, six port antenna with a 65° azimuth beamwidth covering 694-960 MHz and 1695-2690 MHz frequencies
- Four wide high band ports covering 1695-2690 MHz and two wide low band ports covering 694-960 MHz in a single antenna
- New enclosure with <12" (305 mm) width, narrowest enclosure in the industry
- Full Spectrum Compliance 694-960 MHz / 1695-2690 MHz
- 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
- Ordering options for 7/16 DIN connector or the new 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

### Overview

The CCI TriBand is a six port antenna, with four wide high band ports covering 1695-2690 MHz and two wide low band ports covering 694-960 MHz. The CCI TriBand antenna 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 TriBand antenna 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 connectors
- With CCI's TriBand antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs



TriBand Antenna

HPA65R-KE4A

SPECIFICATIONS

Electrical

Ports	2 × Low Band Ports for 694-960 MHz			
Frequency Range	694-806 MHz	790-862 MHz	824-896 MHz	880-960 MHz
Gain	13.1 dBi	13.2 dBi	13.4 dBi	13.5 dBi
Azimuth Beamwidth (-3dB)	69°	71°	68°	62°
Elevation Beamwidth (-3dB)	20.1°	18.5°	17.9°	16.8°
Electrical Downtilt	2° to 16°	2° to 16°	2° to 16°	2° to 16°
Elevation Sidelobes (1st Upper)	< -17 dB	< -17 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination at Peak	> 28 dB	> 28 dB	> 28 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 (2x20W)	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts	500 watts	500 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

BASTA Electrical Specifications*				
Frequency Range	694-806 MHz	790-862 MHz	824-896 MHz	880-960 MHz
Gain over all Tilts (dBi)	12.7	12.8	12.9	13.0
Gain over all Tilts Tolerance (dB)	0.3	0.3	0.5	0.5
Gain at Low-Tilt (dBi)	12.9	13.0	13.1	13.4
Gain at Mid-Tilt (dBi)	12.7	12.8	13.0	13.1
Gain at High-Tilt (dBi)	12.5	12.6	12.6	12.6
Azimuth Beamwidth Tolerance (°)	2.9	3.2	5.6	3.2
Elevation Beamwidth Tolerance (°)	1.2	0.6	0.9	0.9
Electrical Downtilt Deviation (°)	0.7	0.9	0.9	0.8
First Upper Sidelobe Suppression (dB)	15.1	14.0	15.1	15.3
Upper Sidelobe Suppression Peak to 20° (dB)	20.0	20.0	19.8	18.8
Front-to-Back Ratio over ±20° (dB)	27.3	28.6	28.9	27.3
Cross-polar Discrimination at ±60° (dB)	9.0	9.3	10.4	8.7

\* Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6. All specifications are subject to change without notice.



TriBand Antenna

HPA65R-KE4A

SPECIFICATIONS

Ports	4 x High Band Ports for 1695-2690 MHz				
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Gain	16.6 dBi	17.0 dBi	17.2 dBi	17.3 dBi	16.9 dBi
Azimuth Beamwidth (-3dB)	64°	65°	64°	61°	63°
Elevation Beamwidth (-3dB)	8.1°	7.2°	6.8°	6.0°	5.7°
Electrical Downtilt	2° to 10°	2° to 10°	2° to 10°	2° to 10°	2° to 10°
Elevation Sidelobes (1st Upper)	< -18 dB	< -18 dB	< -17 dB	< -15 dB	< -15 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination at Peak	> 18 dB	> 17 dB	> 18 dB	> 20 dB	> 19 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 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	< 1.5:1
Passive Intermodulation (2x20W)	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc	≤ -153 dBc
Input Power Continuous Wave (CW)	300 watts	300 watts	300 watts	300 watts	300 watts
Polarization	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

BASTA Electrical Specifications*	4 x High Band Ports for 1695-2690 MHz				
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Gain over all Tilts (dBi)	15.9	16.3	16.6	16.6	15.8
Gain Tolerance over all Tilts (dB)	0.6	0.5	0.5	0.5	0.8
Gain at Low-Tilt (dBi)	15.8	16.1	16.4	16.7	15.7
Gain at Mid-Tilt (dBi)	15.9	16.4	16.6	16.7	16.0
Gain at High-Tilt (dBi)	15.9	16.5	16.7	16.5	15.8
Azimuth Beamwidth Tolerance (°)	5.4	3.2	3.2	4.8	7.8
Elevation Beamwidth Tolerance (°)	0.6	0.5	0.5	0.5	0.5
Electrical Downtilt Deviation (°)	1.0	0.8	0.7	0.8	0.9
First Upper Sidelobes Suppression (dB)	14.6	15.9	15.0	12.2	12.2
Upper Sidelobe Suppression Peak to 20° (dB)	13.8	13.6	12.7	10.6	11.9
Front-to-Back Ratio over ±20° (dB)	26.6	28.6	28.1	27.8	27.2
Cross-polar Discrimination at ±60° (dB)	7.0	4.3	4.6	7.2	6.3

\* Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6. All specifications are subject to change without notice.

Mechanical

Dimensions (LxWxD)	48.0x11.7x7.7 in (1219x297x196 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	127 lbs (564 N) @ 100 mph (161 kph)
Side Wind Load	90 lbs (399 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	5.0 ft <sup>2</sup> (0.5 m <sup>2</sup> )
Weight*	28.7 lbs (13.0 kg)
RET Weight	3.3 lbs (1.5 kg) for two RET's 5.0 lbs (2.3 kg) for three RET's
Connector	6x 7-16 DIN female long neck or 6x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

\* Weight excludes mounting and RET



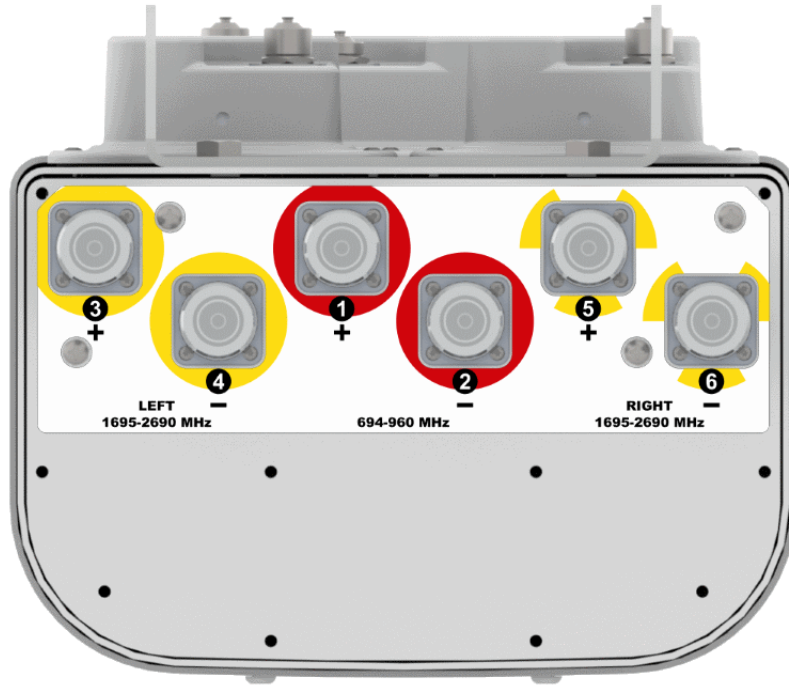
SPECIFICATIONS

TriBand Antenna

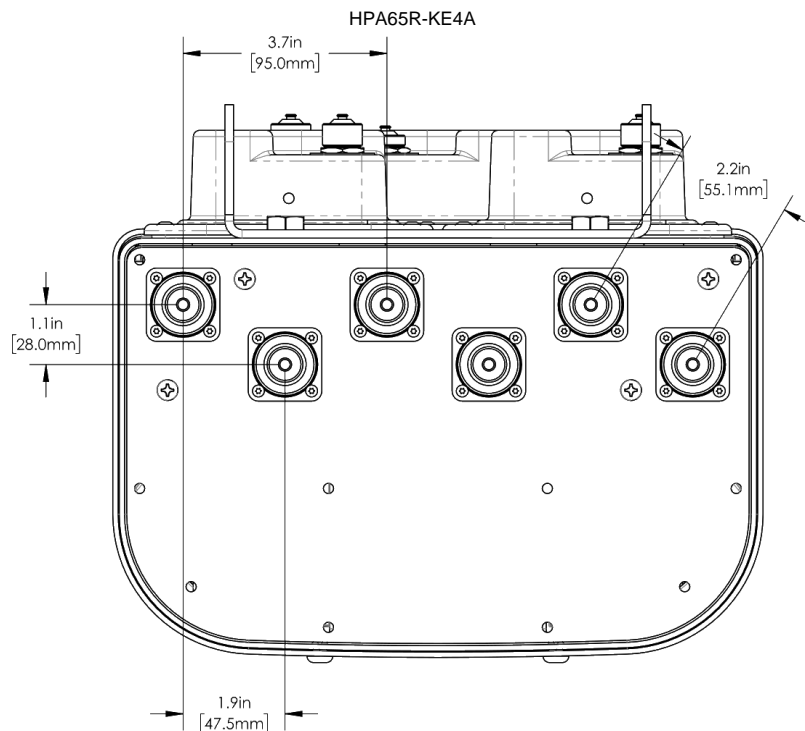
HPA65R-KE4A

Bottom View

HPA65R-KE4A model



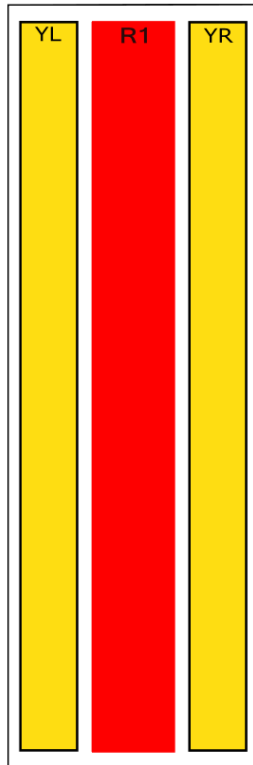
Connection Spacing Diagram



RET to Element Configuration

HPA65R-KE4AA and AB Element and RET configuration

## Top of antenna Viewed from rear



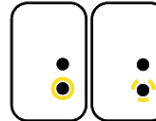
### RET placement as view from rear of antenna

Top of antenna



694-960  
Ports 1, 2  
(R1)

Left  
1695-2690  
Ports 3, 4  
(YL)



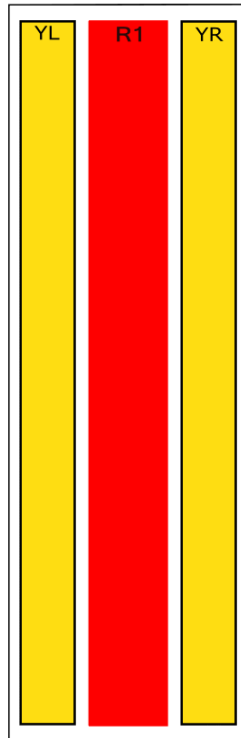
Right  
1695-2690  
Ports 5, 6  
(YR)

Array	Ports	Freq (MHz)	Ports controlled by common RET
R1	1, 2	694-960	1, 2
YL	3, 4	1695-2690	3, 4
YR	5, 6	1695-2690	5, 6

RET to Element Configuration

HPA65R-KE4AC & AD Element and RET configuration

### Top of antenna Viewed from rear



### RET placement as view from rear of antenna

Top of antenna



694-960  
Ports 1, 2  
(R1)



Left & Right  
1695-2690  
Ports 3, 4, 5, 6  
(YL & YR)

Array	Ports	Freq (MHz)	Ports controlled by common RET
R1	1, 2	694-960	1, 2
YL	3, 4	1695-2690	3, 4, 5, 6
YR	5, 6	1695-2960	



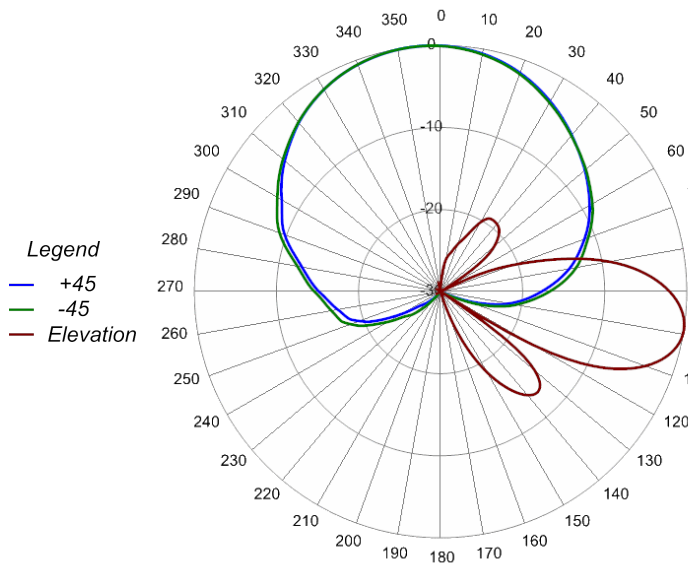
TriBand Antenna

HPA65R-KE4A

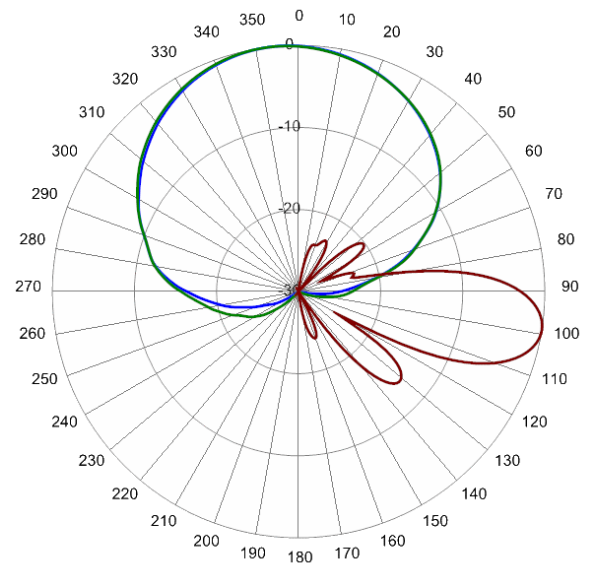
SPECIFICATIONS

Typical Antenna Patterns

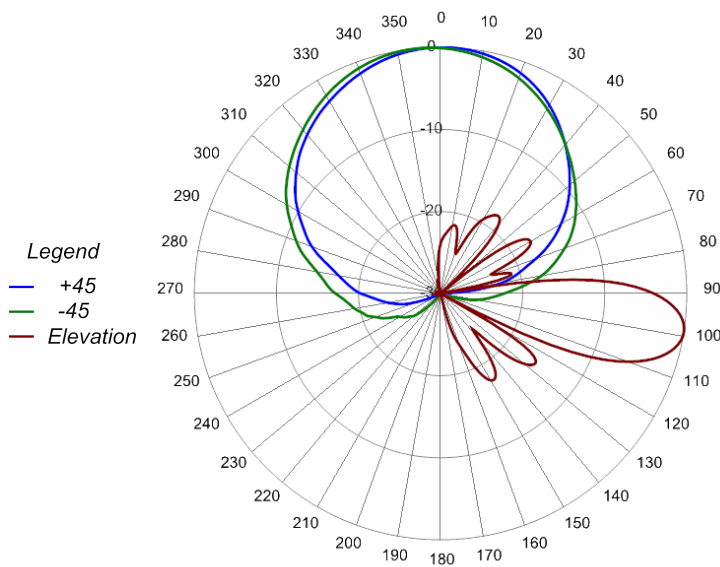
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com



704 MHz Azimuth with Elevation 9°



850 MHz Azimuth with Elevation 9°



945 MHz Azimuth with Elevation 9°

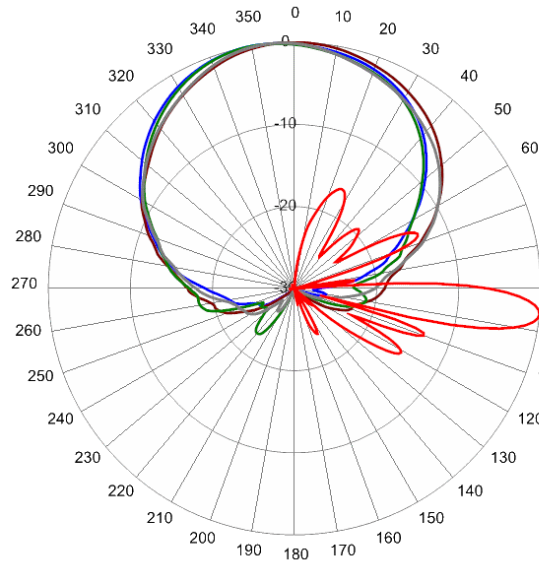


TriBand Antenna

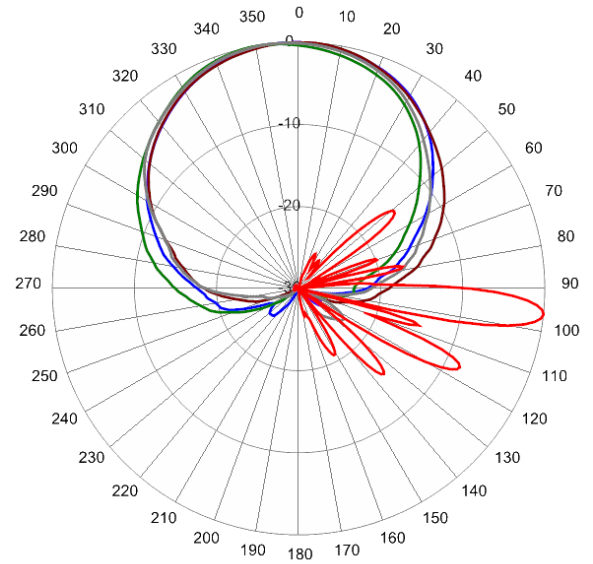
HPA65R-KE4A

SPECIFICATIONS

- Legend
- +45 Left
  - -45 Left
  - +45 Right
  - -45 Right
  - Elevation

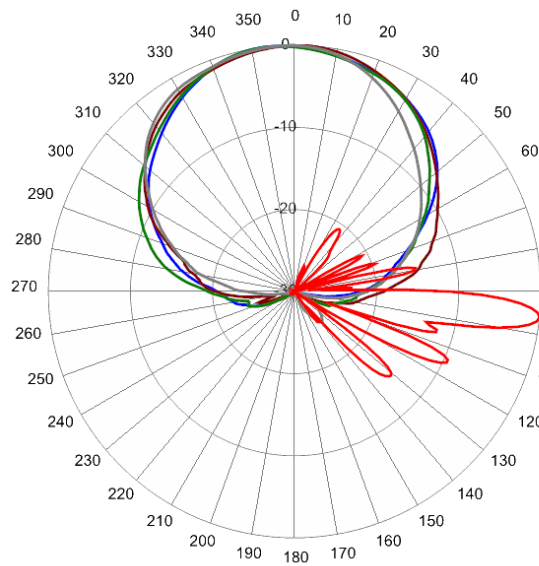


1755 MHz Azimuth with Elevation 6°

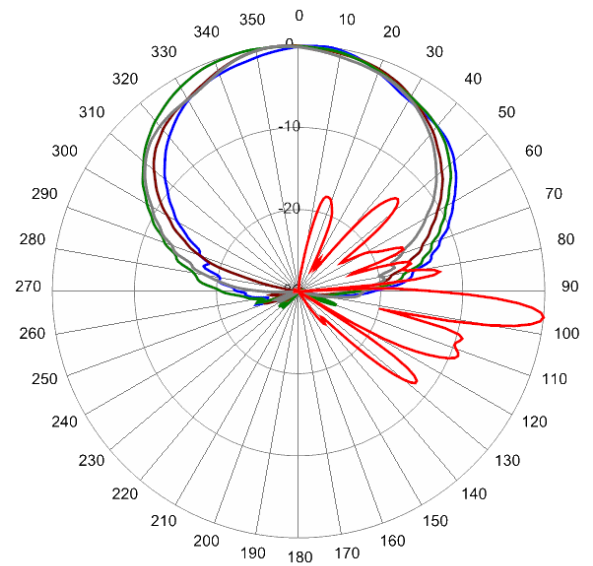


1960 MHz Azimuth with Elevation 6°

- Legend
- +45 Left
  - -45 Left
  - +45 Right
  - -45 Right
  - Elevation



2155 MHz Azimuth with Elevation 6°



2500 MHz Azimuth with Elevation 6°





Parts & Accessories

<b>HPA65R-KE4AA-K</b>	Four foot (1.2 m) TriBand antenna with 65° azimuth beamwidth, 7-16 DIN female connectors, 3 factory installed BSA-RET200 RET actuators and MBK-02 mounting bracket
<b>HPA65R-KE4AB-K</b>	Four foot (1.2 m) TriBand antenna with 65° azimuth beamwidth, 4.3-10 female connectors, 3 factory installed BSA-RET200 RET actuators and MBK-02 mounting bracket
<b>HPA65R-KE4AC-K</b>	Four foot (1.2 m) TriBand antenna with 65° azimuth beamwidth, 7-16 DIN female connectors, 2 factory installed BSA-RET200 RET actuators and MBK-02 mounting bracket
<b>HPA65R-KE4AD-K</b>	Four foot (1.2 m) TriBand antenna with 65° azimuth beamwidth, 4.3-10 female connectors, 2 factory installed BSA-RET200 RET actuators 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>	Remote electrical tilt actuator
<b>HPA-CBK-AG-RRU</b>	TriBand antenna with 3 RET to RRU AISG cable kit
<b>HPA-CBK-RA-AG-RRU</b>	TriBand antenna with 3 RET to RRU AISG right angle cable kit
<b>QPA-CBK-AG-RRU</b>	TriBand antenna with 2 RET to RRU AISG cable kit
<b>QPA-CBK-RA-AG-RRU</b>	TriBand antenna with 2 RET to RRU AISG right angle cable kit

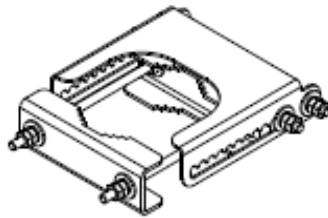


Mounting Bracket Kit

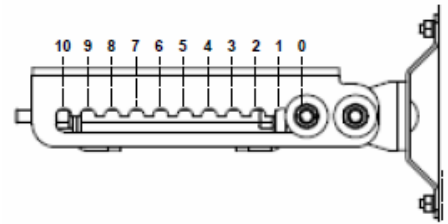
MBK-02

Mechanical

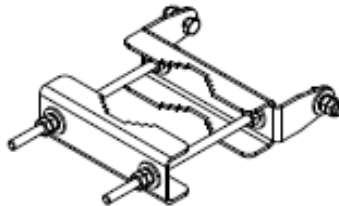
<b>Weight</b>	9.8 lbs (4.4 kg)
<b>Hinge Pitch</b>	31.5 in (800 mm)
<b>Mounting Pole Dimension</b>	2 to 5 in (5 to 12 cm)
<b>Fastener Size</b>	M10
<b>Installation Torque</b>	15 ft-lbs (20 N·m)
<b>Mechanical Tilt Adjustment</b>	0° - 10°



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

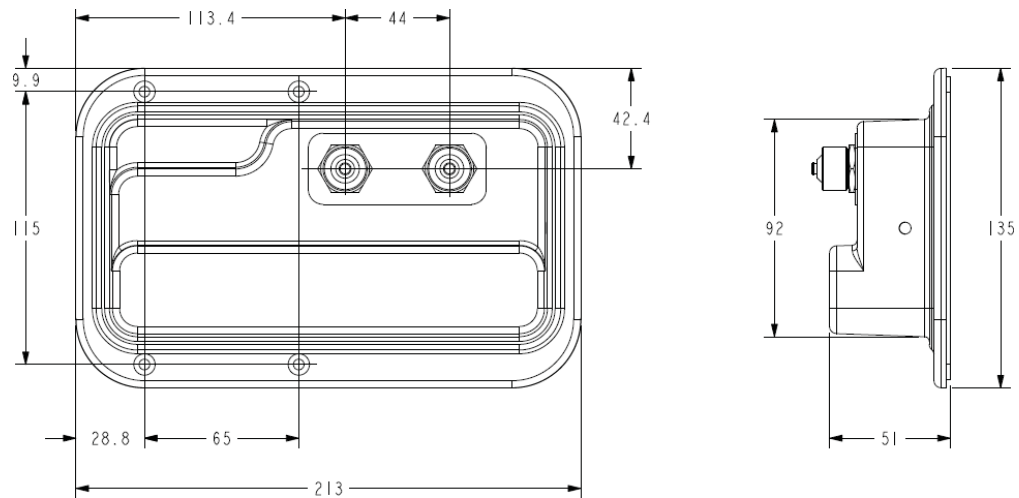
#### Electrical

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



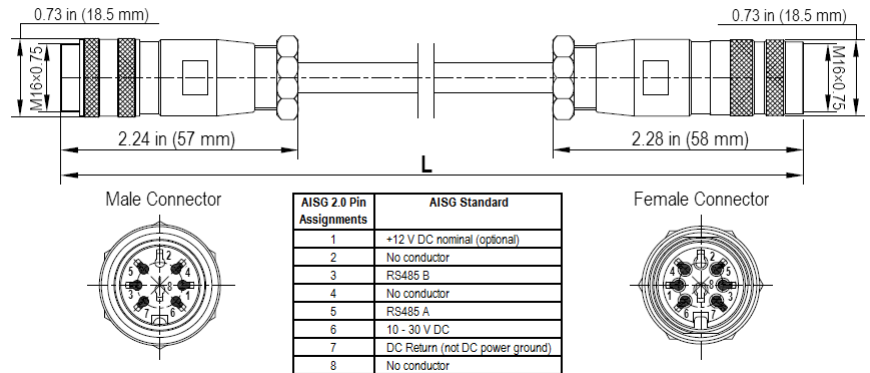


Electrical Specifications

<b>Individual Cable Part Number</b>	AISGC-M-F-18	AISGC-M-F-10FT
<b>Cable style</b>	UL2464	UL2464
<b>Protocol</b>	AISG 1.1 and AISG 2.0	AISG 1.1 and AISG 2.0
<b>Maximum voltage</b>	300 V	300 V
<b>Rated current</b>	5 A at 104° F (40° C)	5 A at 104° F (40° C)

Mechanical Specifications

<b>Individual Cable Part Number</b>	AISGC-M-F-18	AISGC-M-F-10FT
<b>Cables per kit</b>	2	2
<b>Connectors</b>	2 x 8 pin IEC 60130-9 Straight male/straight female	2 x 8 pin IEC 60130-9 Straight male/straight female
<b>Tightening torque</b>	Hand tighten only ≈ 1.84 ft-lbs (2.5 N-m)	Hand tighten only ≈ 1.84 ft-lbs (2.5 N-m)
<b>Construction</b>	Shielded (Tinned Copper Braid)	Shielded (Tinned Copper Braid)
<b>Braid coverage</b>	85%	85%
<b>Jacket Material</b>	Matte Polyurethane (Black)	Matte Polyurethane (Black)
<b>Conductors</b>	1 twisted pair - 24 AWG 3 conductors - 19 AWG AWM style 2464	1 twisted pair - 24 AWG 3 conductors - 19 AWG AWM style 2464
<b>Cable Diameter</b>	0.307 in (7.8 mm)	0.307 in (7.8 mm)
<b>Length</b>	18 - 20 in (457 - 508 mm)	120 in (3048 mm)
<b>Weight</b>	0.27 lbs (0.12 kg)	0.69 lbs (.31 kg)
<b>Minimum bend radius</b>	3.9 in (100 mm)	3.9 in (100 mm)



AISG-Male to AISG-Female Jumper Cable

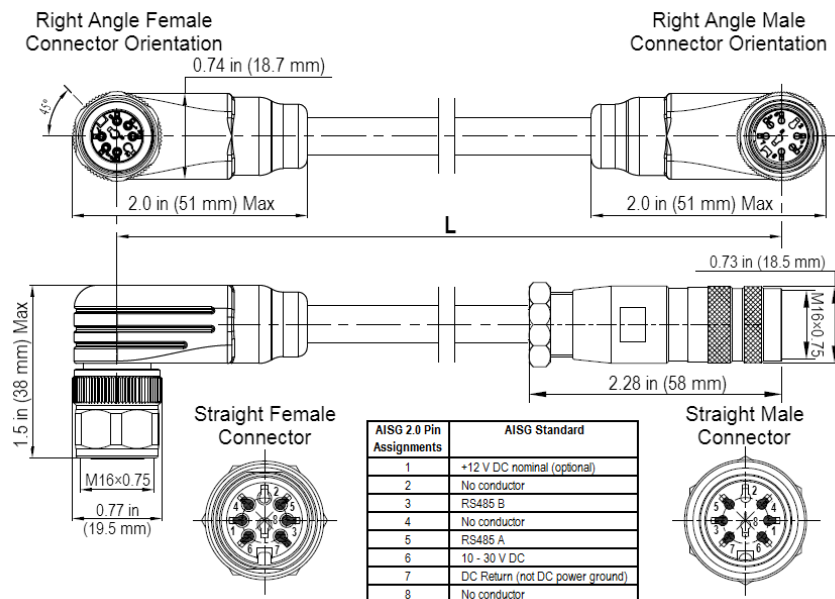
Environmental Specifications

<b>Individual Cable Part Number</b>	AISGC-M-F-18	AISGC-M-F-10FT
<b>Temperature Range</b>	-40° to 80° C	-40° to 80° C
<b>Flammability</b>	UL 1581 VW-1	UL 1581 VW-1
<b>Ingress Protection</b>	IEC 60529:2001, IP67	IEC 60529:2001, IP67

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 ≈ 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 3 conductors - 19 AWG 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 Right angle male/right angle female	2 x 8 pin IEC 60130-9 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	2	2

Mechanical Specifications



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



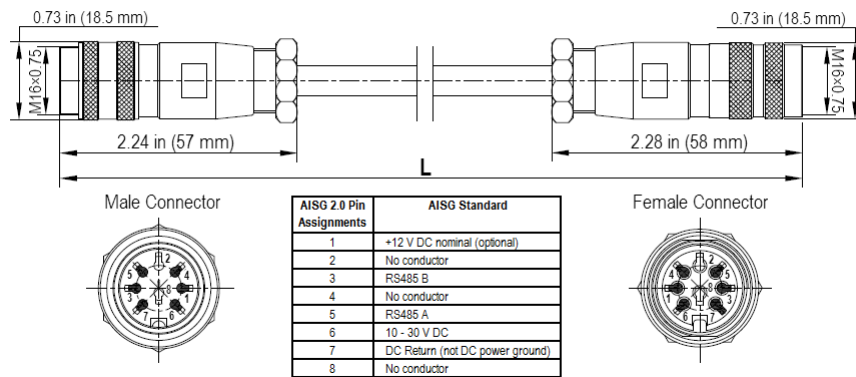
Quad Port AISG Cable Kit

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 ≈ 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 3 conductors - 19 AWG 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



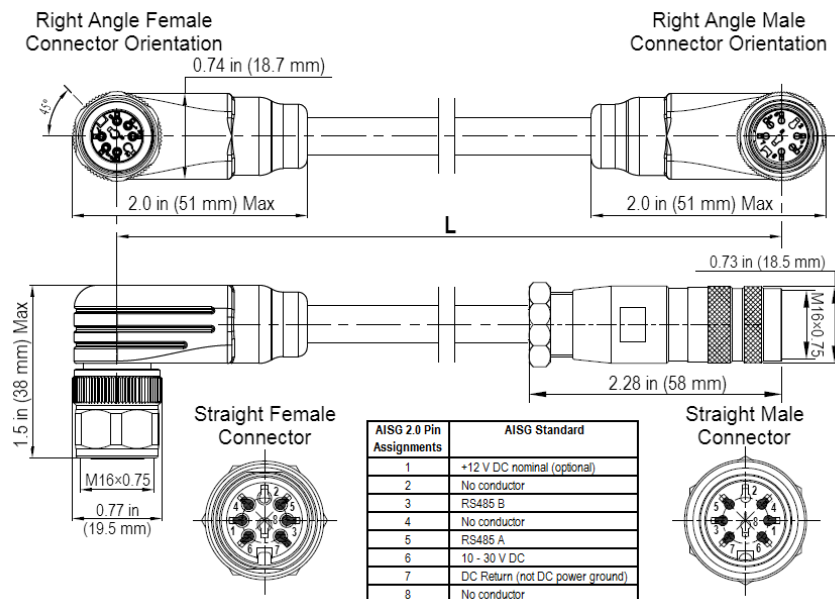
Quad Port AISG Cable Kit

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 ≈ 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 3 conductors - 19 AWG 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 Right angle male/right angle female	2 x 8 pin IEC 60130-9 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



STANDARDS & CERTIFICATIONS

TriBand Antenna

HPA65R-KE4A

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

