



# Antennas

## DATA SHEET

### Hybrid Bi-Sector™ Array

HBSA33R-KE6B



- Six foot (1.8 m), multiband, Ten port Hybrid Bi-Sector™ Antenna. Deploying a high performing 65° azimuth beamwidth covering 698-960 MHz and a pair of CCI's Patented Asymmetrical 33° Shaped Beams covering 1695-2690 MHz frequencies
- Eight wide high band ports covering 1695-2690 MHz and two wide low band ports covering 698-960 MHz in a single antenna
- Narrow Enclosure, 13.7" (348 mm) width. Narrowest Enclosure in the Industry for this type of Antenna
- Full Spectrum Compliance for 698-960 MHz /1695-2690 MHz
- LTE Optimized Asymmetric Shaped Beams for improved LTE data throughput by minimizing beam crossover, providing for an efficient use of valuable radio capacity and frequency spectrum
- LTE Optimized FBR, SPR and Boresight/Sector XPD Performance, essential for today's LTE Data Networks
- Exceeds minimum PIM performance requirements
- Equipped with new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Equipped with Three Field Replaceable, integrated AISG 2.0 compliant Remote Electrical Tilt (RET)

#### Overview

This version of the CCI Hybrid Bi-Sector™ Multiband Array is a ten port antenna, with eight wide high band ports covering 1695-2690 MHz and two wide low band ports covering 698-960 MHz. The CCI Hybrid Bi-Sector™ array uses a pair of CCI's Patented Asymmetric 33° Shaped Beams in the High Band frequencies and a high performance 65° azimuth beamwidth in the low band frequencies. The CCI Hybrid Bi-Sector Array thus provides the capability to deploy Dual (over split beams) 4x4 Multiple-input Multiple-output (MIMO) in the high band and Single 2x2 Multiple-input Multiple-output in the low band. The CCI Hybrid Bi-Sector™ Array utilizes three RET controllers, with a separate RET control for the Low Band ports and a separate RET control in the High Band for each LEFT and RIGHT pair of CCI's Patented Asymmetric 33° Shaped Beams. Also available with Manual Variable Electrical Tilt option.

The CCI Hybrid Bi-Sector™ Multiband Array, allow operators to reduce antenna count and replace existing 65° networks, while increasing cell site capacity and LTE data throughput by minimizing overlap between CCI's Patented Asymmetric 33° Shaped Beams. This design approach lowers interference between sectors. All of this is achieved through a single panel array, producing significant CAPEX and OPEX cost savings for the operator. CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

#### Applications

- Dual (over split beams) 4x4 MIMO on High Band and 2x2 MIMO on Low Band
- Ready for Network Standardization on 4.3-10 connectors
- Ideal Antenna Solution for structurally constrained sites, where data throughput, capacity and limited spectrum is a concern
- With CCI's Hybrid Bi-Sector™ Antenna, wireless operators can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation cost



# Antennas

## SPECIFICATIONS

### Hybrid Bi-Sector™ Array

HBSA33R-KE6B

#### Electrical

Ports	2 × Low Band Ports for 698-960 MHz			
Frequency Range	698-806 MHz	790-862 MHz	824-896 MHz	880-960 MHz
Gain <sup>1</sup>	14.3 dBi	14.5 dBi	14.7 dBi	14.7 dBi
Gain (Average) <sup>2</sup>	13.9 dBi	14.1 dBi	14.3 dBi	14.4 dBi
Azimuth Beamwidth (-3dB)	68°	71°	68°	64°
Elevation Beamwidth (-3dB)	13.5°	12.1°	11.6°	10.9°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 10°	0° to 10°
Elevation Sidelobes (1st Upper)	< -20 dB	< -20 dB	< -20 dB	< -19 dB
Front-to-Back Ratio @180°	> 30 dB	> 32 dB	> 34 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 30 dB	> 32 dB	> 34 dB	> 35 dB
Cross-Polar Discrimination (at Peak)	> 22 dB	> 25 dB	> 25 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 Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 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.

Ports	8 × 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 <sup>1</sup>	17.1 dBi	17.5 dBi	17.8 dBi	18.2 dBi	18.9 dBi
Gain (Average) <sup>2</sup>	16.1 dBi	16.8 dBi	17.1 dBi	17.7 dBi	18.1 dBi
Azimuth Beamwidth (-3dB)	36°	33°	32°	28°	26°
Elevation Beamwidth (-3dB)	10.0°	8.9°	8.4°	7.5°	6.8°
Electrical Downtilt	2° to 10°	2° to 10°	2° to 10°	2° to 10°	2° to 10°
Elevation Sidelobes (1st Upper)	< -17 dB	< -18 dB	< -17 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 32 dB	> 32 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> 25 dB	> 25 dB	> 24 dB	> 22 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 Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 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

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

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



# Antennas

## SPECIFICATIONS

### Hybrid Bi-Sector™ Array

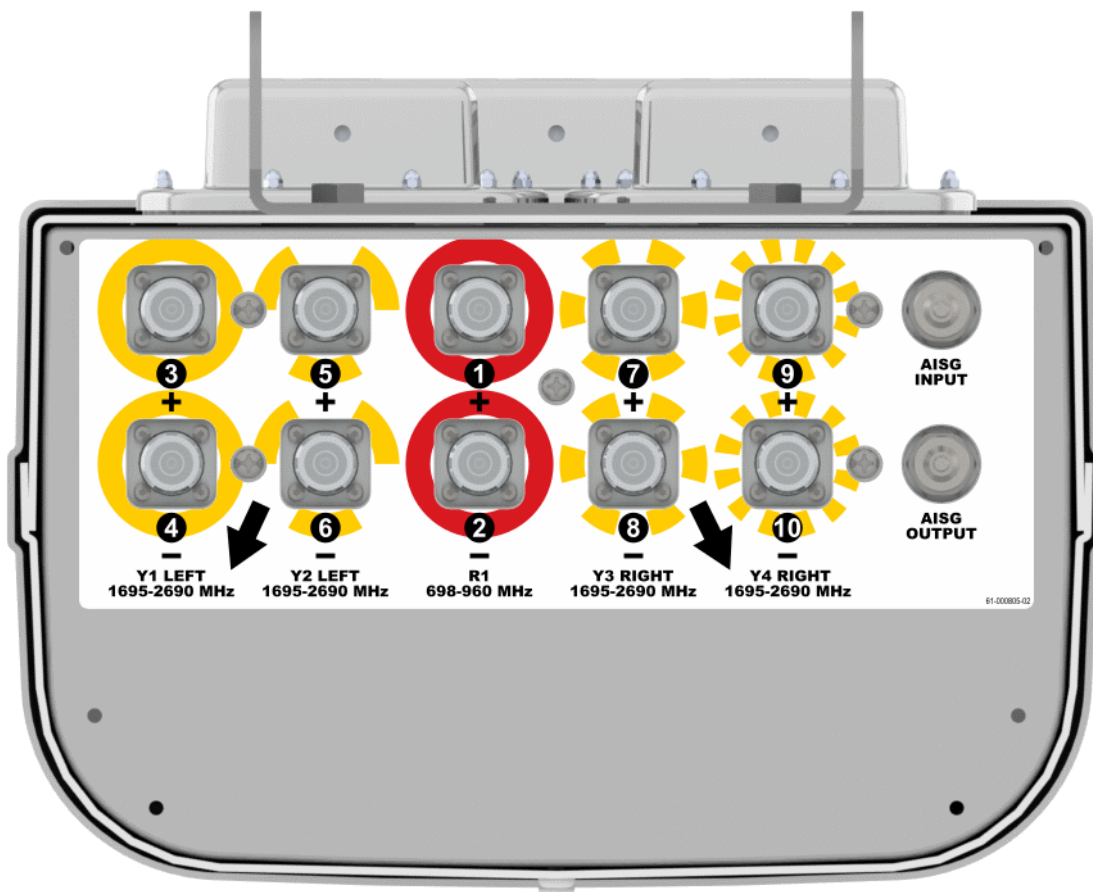
HBSA33R-KE6B

#### Mechanical

Dimensions (LxWxD)	72.3x13.7x8.5 in (1838x348x216 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	233 lbs (1037 N) @ 100 mph (161 kph)
Side Wind Load	158 lbs (705 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	9.1 ft <sup>2</sup> (0.8 m <sup>2</sup> )
Weight*	59.5 lbs (27.0 kg)
Connector	10 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

\* Weight excludes mounting

Bottom View





# Antennas

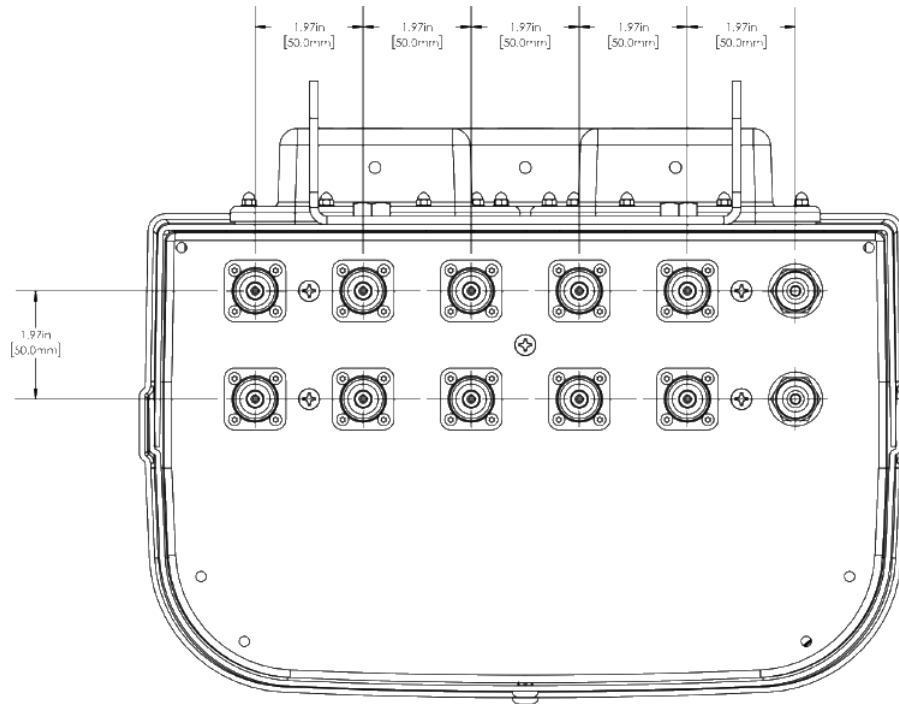
## SPECIFICATIONS

### Hybrid Bi-Sector™ Array

HBSA33R-KE6B

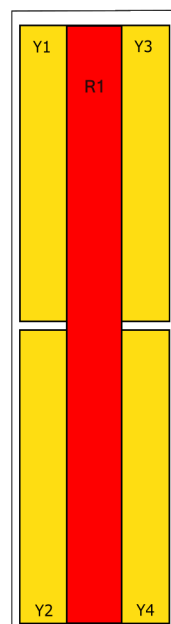
#### Mechanical

##### Connector Spacing



##### RET to Array Configuration

#### Element arrays as viewed from rear of antenna



#### RET placement as viewed from rear of antenna

Top of antenna



MM.1



MM.2 MM.3

Array	Ports	Freq (MHz)	Ports controlled by common RET	AISG RET UID
R1	1, 2	698-960	1, 2	C1xxxxxxMM.1
Y1	3, 4	1695-2690	3, 4, 5, 6	C1xxxxxxMM.2
Y2	5, 6	1695-2690		
Y3	7, 8	1695-2690		C1xxxxxxMM.3
Y4	9, 10	1695-2690	7, 8, 9, 10	



# Antennas

## SPECIFICATIONS

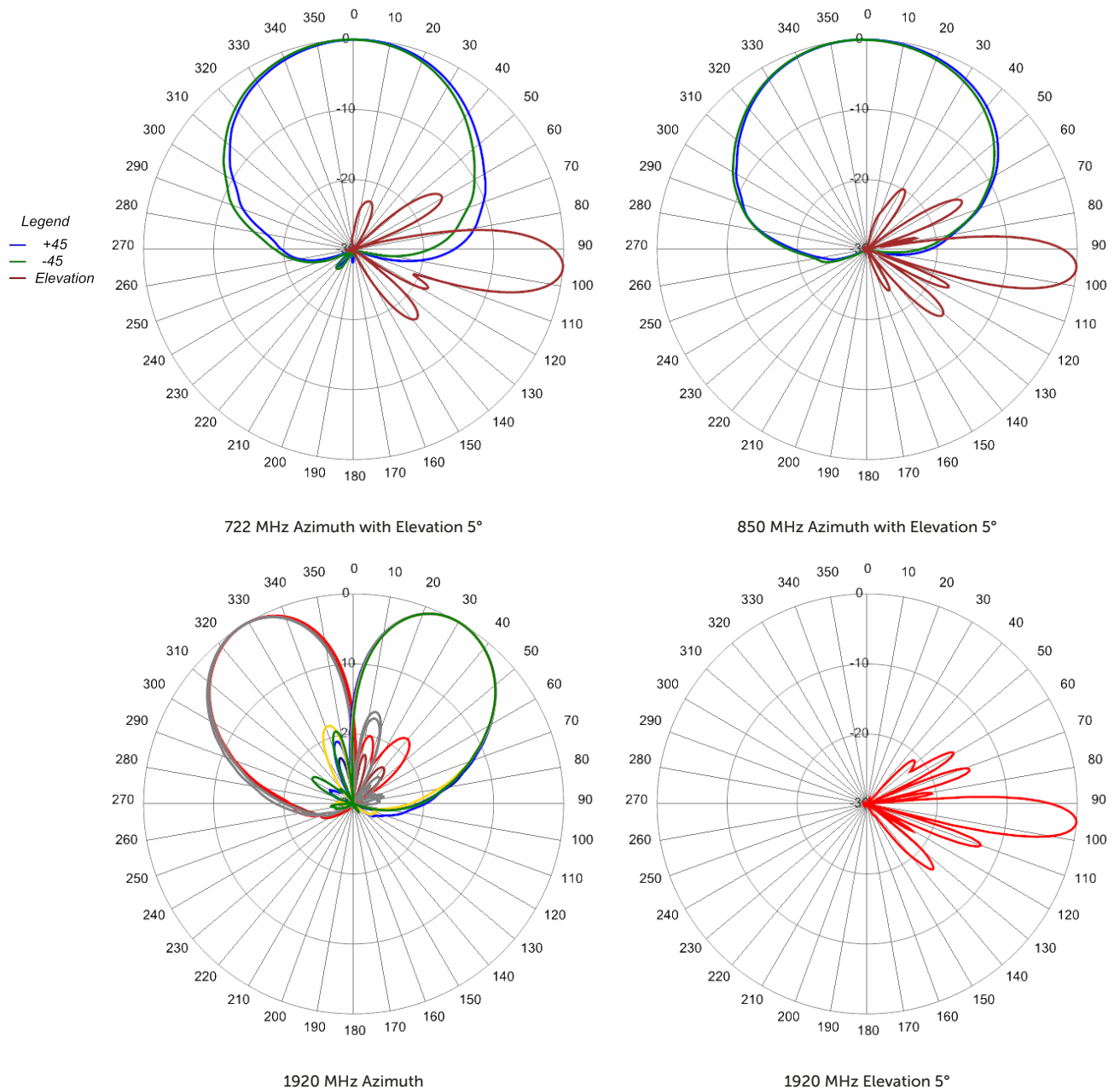
### Hybrid Bi-Sector™ Array

HBSA33R-KE6B

#### Typical Antenna Patterns

Connector Spacing

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



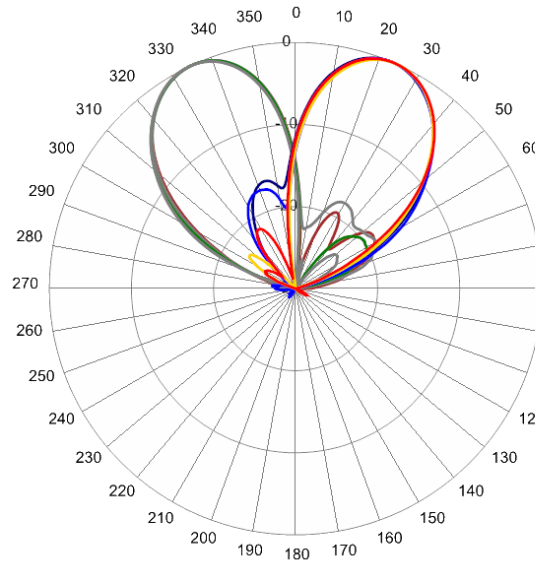


# Antennas

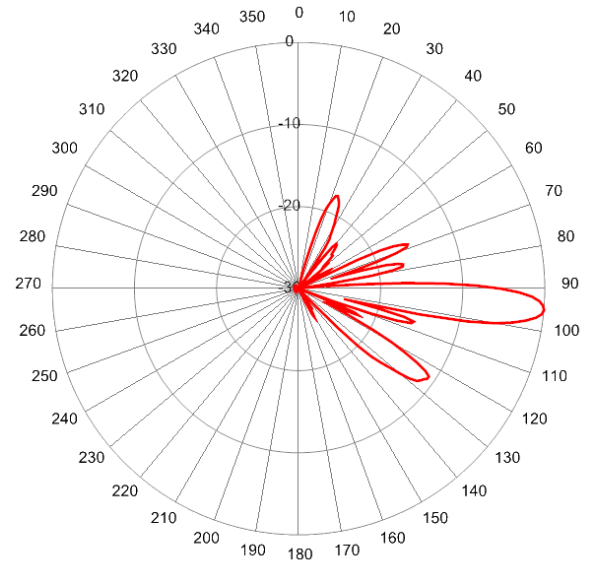
## SPECIFICATIONS

### Hybrid Bi-Sector™ Array

HBSA33R-KE6B



2500 MHz Azimuth



2500 MHz Elevation 5°



# Antennas

## ORDERING

### Hybrid Bi-Sector™ Array

HBSA33R-KE6B

#### Parts & Accessories

<b>HBSA33R-KE6BA-K</b>	Six foot (1.8 m) Hybrid Bi-Sector™ Antenna Array with 4.3-10 female connectors, 3 factory installed external BSA-RET400 RET actuators (Type 17 Internal) and MBK-01 mounting brackets
<b>MBK-01</b>	Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment
<b>MBK-16</b>	Mounting bracket kit (top and bottom) with fixed 0° mechanical tilt
<b>DM-02</b>	Dual mount mast bracket for side by side antenna mounting
<b>TM-01</b>	Triple antenna pole mounting mast bracket
<b>BSA-RET400</b>	Type 17 remote electrical tilt actuator
<b>AISGC-M-F-10FT</b>	10 Ft (3 m) Male/Female RRU to Antenna AISG cable



# Antennas

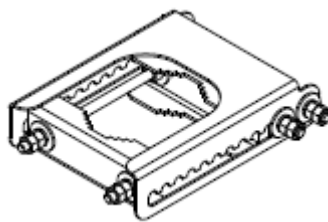
## ACCESSORIES

### Mounting Bracket Kit

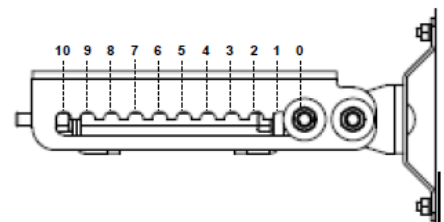
MBK-01

#### Mechanical

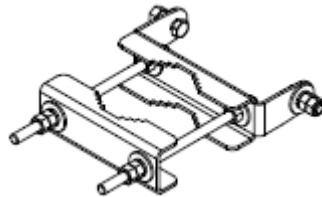
<b>Weight</b>	12.6 lbs (5.7 kg)
<b>Hinge Pitch</b>	47.25 in (1200 mm)
<b>Mounting Pole Dimension</b>	2 to 5 in (5 to 12 cm)
<b>Fastener Size</b>	M12
<b>Installation Torque</b>	40 ft·lb (54 N·m)
<b>Mechanical Tilt Adjustment</b>	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket





# Antennas

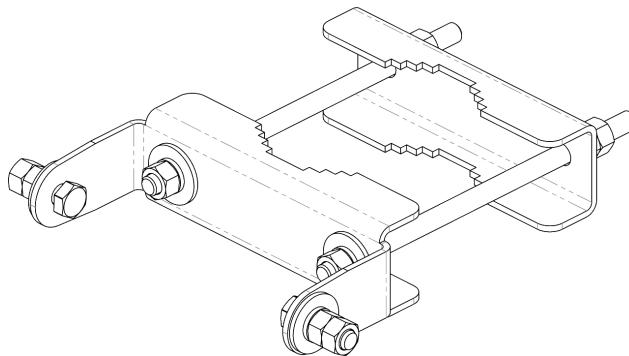
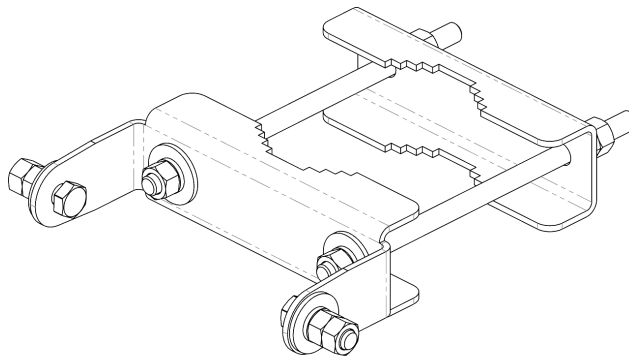
## ACCESSORIES

### Mounting Bracket Kit

MBK-16

#### Mechanical

<b>Weight</b>	9.9 lbs (4.5 kg)
<b>Hinge Pitch</b>	47.25 in (1200 mm)
<b>Mounting Pole Dimension</b>	2 to 5 in (5 to 12 cm)
<b>Fastener Size</b>	M12
<b>Installation Torque</b>	40 ft·lbs (54 N·m)
<b>Mechanical Tilt</b>	0°



MBK-16 Top and Bottom Bracket



# Antennas

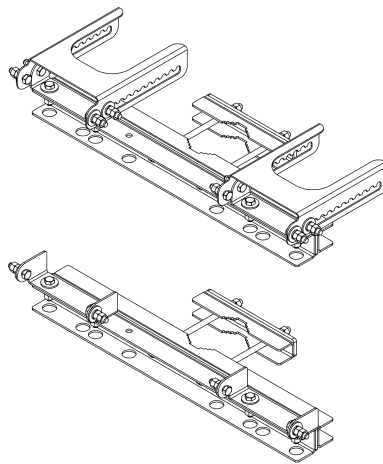
## ACCESSORIES

### Dual Mount Mast Bracket

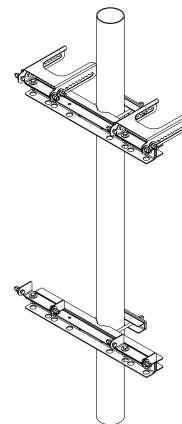
DM-02

#### Mechanical

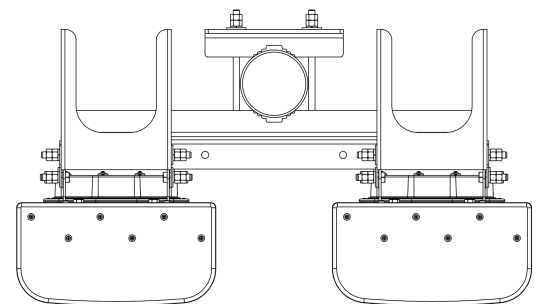
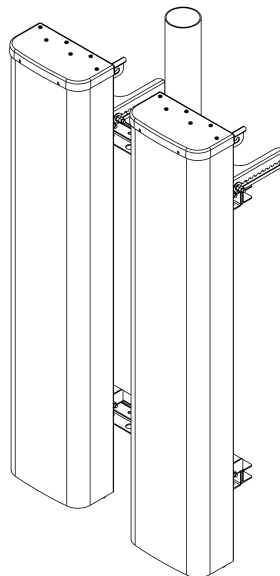
<b>Weight</b>	70.5 lbs (32.0 kg)
<b>Hinge Pitch (Vertical)</b>	47.25 in (1200 mm)
<b>Antenna Spacing (Horizontal)</b>	15.6 in (396 mm) or 23.4 in (594 mm)
<b>Fastener Size</b>	M12
<b>Installation Torque</b>	40 ft·lb (54 N·m)
<b>Mechanical Tilt Adjustment</b>	0° - 10°



DM-02 Bracket



DM-02 Mounting Brackets (on Pole)



Two - 65° Antennas Mounted on Pole using DM-02 Brackets (Iso and Top Views)



# Antennas

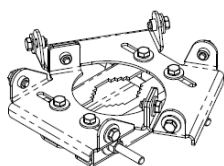
## ACCESSORIES

### Triple Mount Cluster Bracket

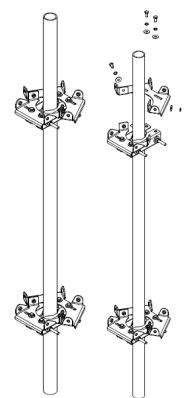
TM-01

#### Mechanical

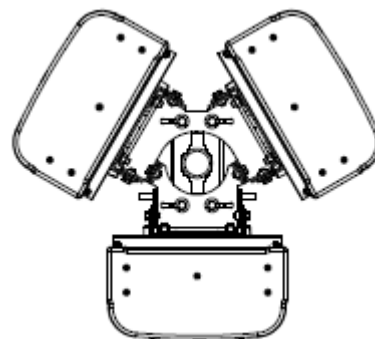
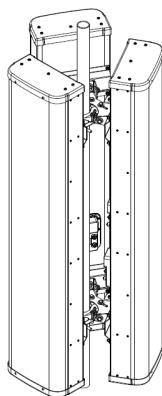
Weight	21.6 lbs (9.8 kg)
Fastener Size	M10
Installation Torque	40 ft-lb (54 N-m)
Hinge Pitch (Vertical)	13.0 in (330 mm) or 31.5 in (800 mm) or 47.2 in (1200 mm)
Mechanical Tilt Adjustment	None



TM-01 Bracket



TM-01 Mounting Brackets (on Pole)



3 - 65° Antennas Mounted on Pole using TM-01 Brackets (Iso and Top Views)



# Antennas

## ACCESSORIES

### 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	$\pm 0.1^\circ$
Temperature Range	-40° C to 70° C

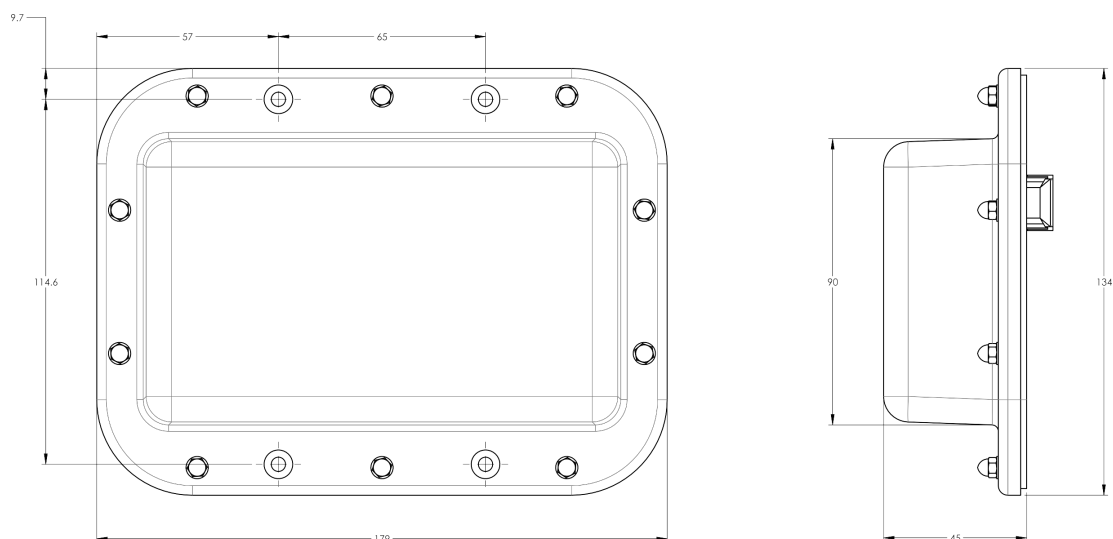
#### Electrical

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





# Antennas

## ACCESSORIES

### AISG Cable

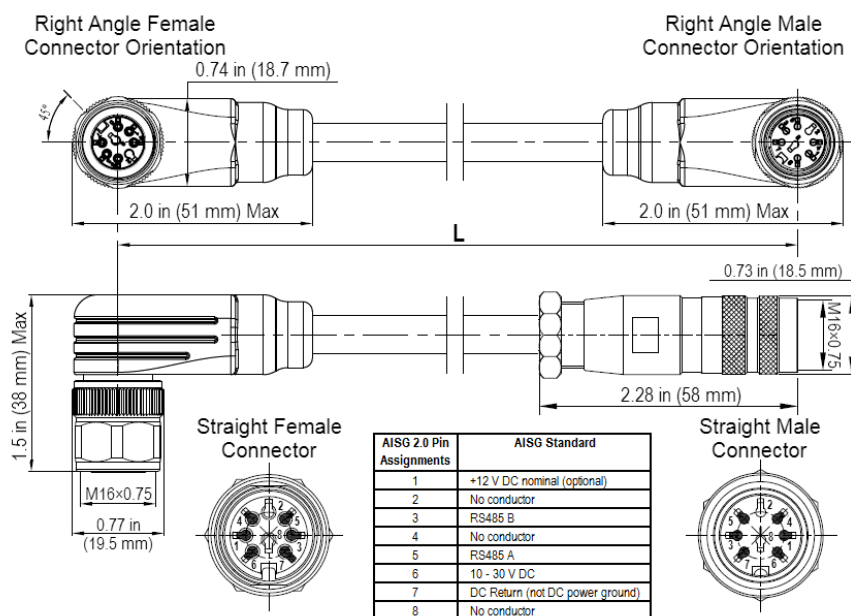
AISGC-M-F-xFT

#### Electrical Specifications

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

#### Mechanical Specifications

Individual Cable Part Number	AISGC-M-F-x(FT)
Cables per kit	1
Connectors	2 x 8 pin IEC 60130-9 Straight male/straight female
Tightening torque	Hand tighten only $\approx 1.84$ ft-lbs (2.5 Nm)
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)
Length	See order details
Minimum bend radius	3.15 in (80 mm)



AISG-Male to AISG-Female Jumper Cable



# Antennas

ACCESSORIES

AISG Cable

AISGC-M-F-xFT

## Environmental Specifications

Individual Cable Part Number	AISGC-M-F-xFT
Temperature Range	-40° to 80° C
Flammability	UL 1581 VW-1
Ingress Protection	IEC 60529:2001, IP67



# Antennas

## STANDARDS & CERTIFICATIONS

### Hybrid Bi-Sector™ Array

HBSA33R-KE6B

#### 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