DATA SHEET

Hybrid Bi-Sector™ Array

HBSA33R-GU6A

Overview

- Six foot (1.9 m), multiband, Ten port Hybrid Bi-Sector™ Antenna. Deploying a high performing 65° azimuth beamwidth covering 617-746 MHz and a pair of CCI's Patented Asymmetrical 33° Shaped Beams covering 1695-2400 MHz frequencies
- Eight wide high band ports covering 1695-2400 MHz and two wide low band ports covering 617-746 MHz in a single antenna
- Narrow Enclosure, 13.4" (340 mm) width. Narrowest Enclosure in the Industry for this type of Antenna
- Full Spectrum Compliance for 617-746 MHZ / 1695-2400 MHz, including AWS-3 and Band 71 Operations
- 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)

This version of the CCI Hybrid Bi-Sector™ Multiband Array is a ten port antenna, with eight wide high band ports covering 1695-2400 MHz and two wide low band ports covering 617-746 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.
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

SPECIFICATIONS

Hybrid Bi-Sector™ Array

HBSA33R-GU6A

Electrical

Ports	2 x Low Band Ports for 617-746 MHz	
Frequency Range	617-698 MHz	698-746 MHz
Gain[1]	14.1 dBi	14.3 dBi
Gain (Average)[2]	13.5 dBi	14.0 dBi
Azimuth Beamwidth (-3dB)	71°	65°
Elevation Beamwidth (-3dB)	14.4°	13.3°
Electrical Downtilt	0° to 10°	0° to 10°
Elevation Sidelobes (1st Upper)	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 28 dB	> 28 dB
Front-to-Back Ratio over ± 20°	> 28 dB	> 28 dB
Cross-Polar Discrimination (at Peak)	> 22 dB	> 22 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB
Voltage Standing Wave Ratio(VSWR)	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts
Polarization	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground

[1]Peak gain across sub-bands.
[2]Electrical specifications follow document "Recommendation on Base Station Antenna Standards"(BASTA) V9.6.

Ports	8 x High Band Ports for 1695-2400 MHz			
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz
Gain[1]	17.3 dBi	17.7 dBi	18.3 dBi	18.7 dBi
Gain (Average)[2]	16.5 dBi	17.1 dBi	17.4 dBi	18.2 dBi
Azimuth Beamwidth (-3dB)	36°	33°	32°	29°
Elevation Beamwidth (-3dB)	9.8°	8.9°	8.5°	7.7°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 10°	0° to 10°
Elevation Sidelobes (1st Upper)	< -17 dB	< -17 dB	< -17 dB	< -18 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Discrimination (at Peak)	> 25 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)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	300 watts	300 watts	300 watts	300 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

[1]Peak gain across sub-bands.
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SPECIFICATIONS

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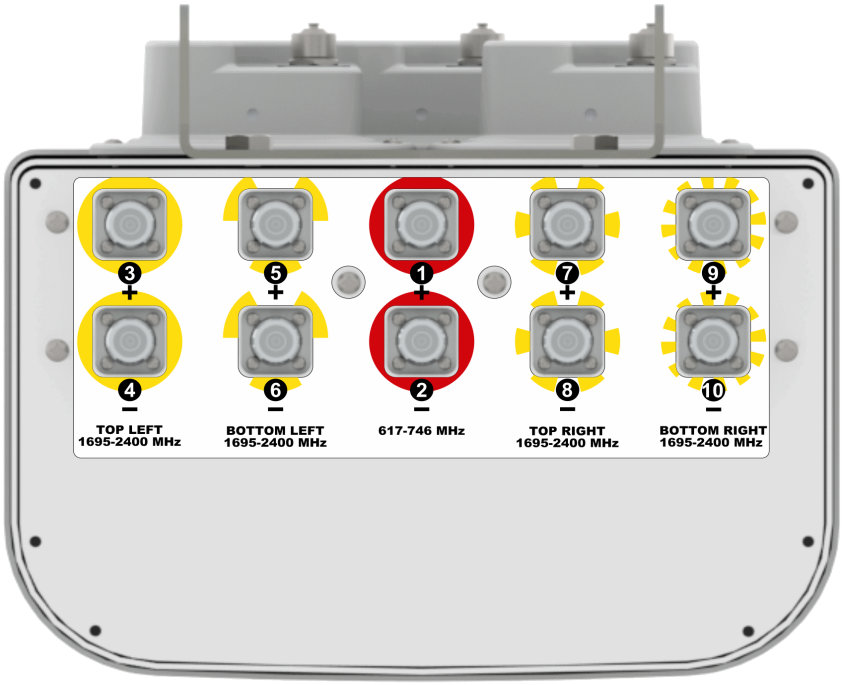
Mechanical

Dimensions (LxWxD)	76.0x13.4x8.5 in (1932x340x216 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	243 lbs (1080 N) @ 100 mph (161 kph)
Side Wind Load	168 lbs (749 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	9.5 ft^2 (0.9 m^2)
Weight*	50.5 lbs (22.9 kg)
RET System Weight	5.0 lbs (2.3 kg)
Connector	10 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

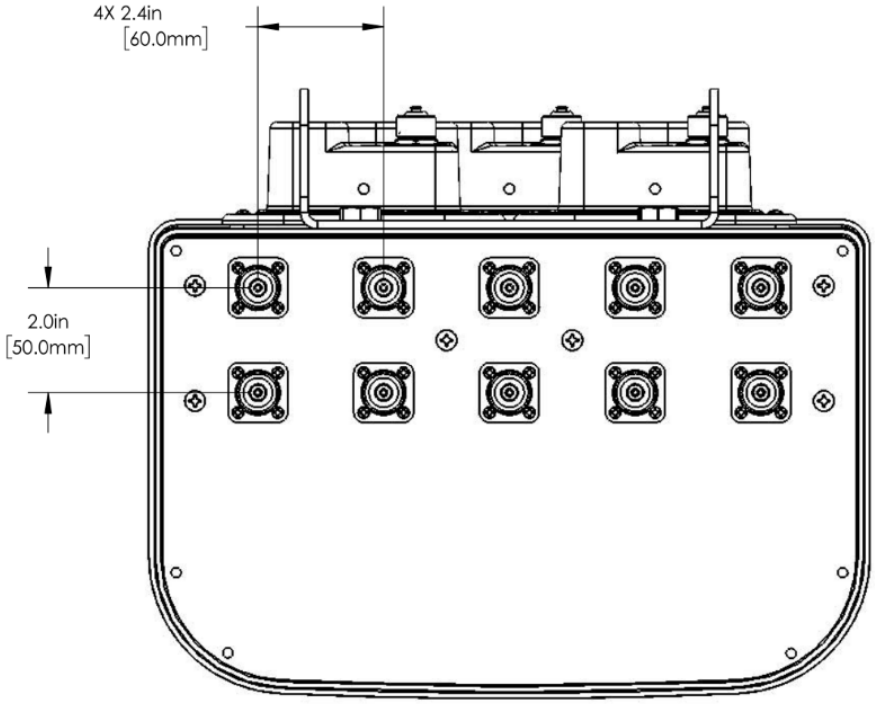
** Weight excludes mounting and RET*

Mechanical

Bottom View



Connector Spacing

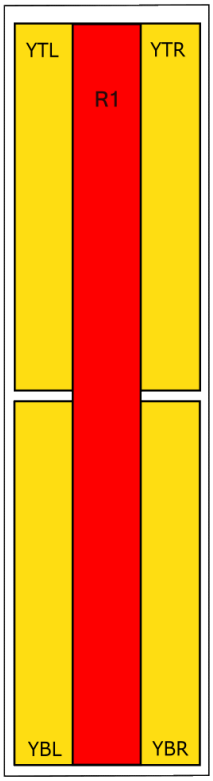


Mechanical

RET to Array Configuration

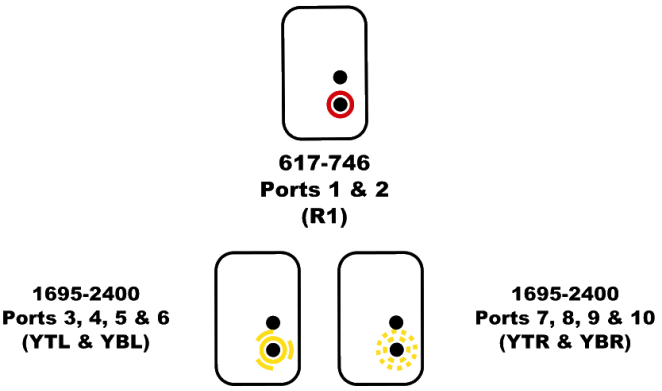
Array	Ports	Freq (MHz)	Ports controlled by common RET
R1	1, 2	617-746	1, 2
YTL	3, 4	1695-2400	3, 4, 5, 6
YBL	5, 6	1695-2400	
YTR	7, 8	1695-2400	7, 8, 9, 10
YBR	9, 10	1695-2400	

Element arrays as viewed from rear of antenna



RET placement as viewed from rear of antenna

Top of antenna



SPECIFICATIONS

Hybrid Bi-Sector™ Array

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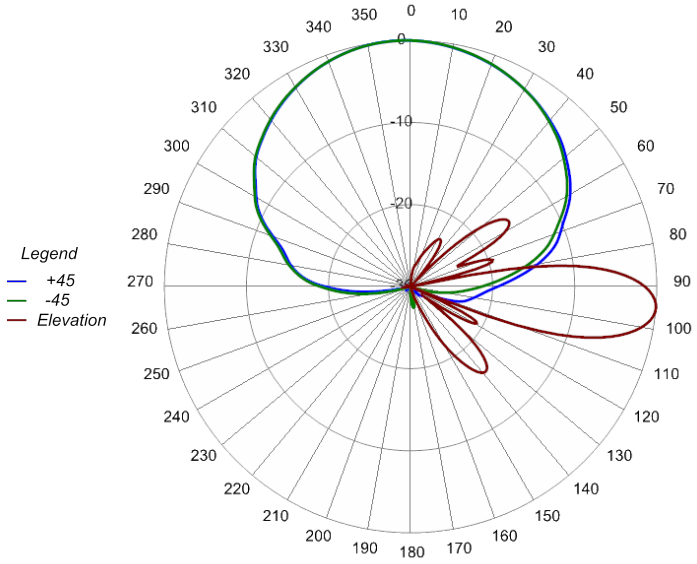
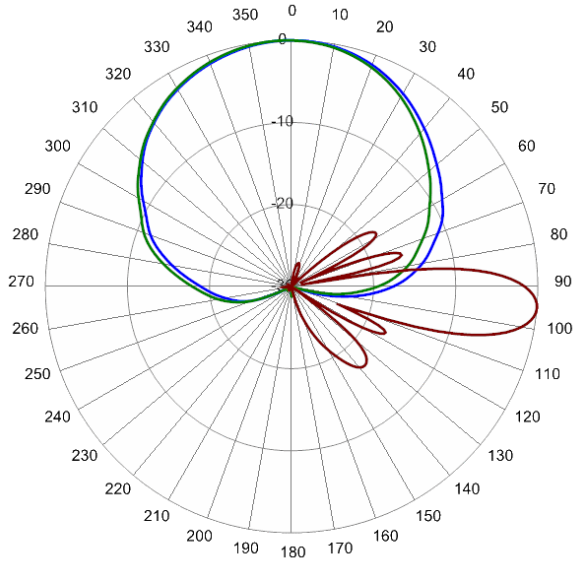
Typical Antenna Patterns

Connector Spacing

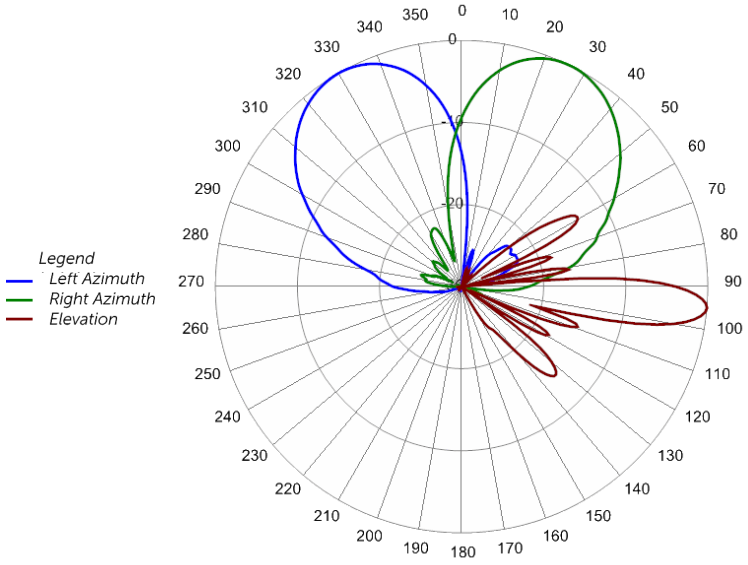
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com



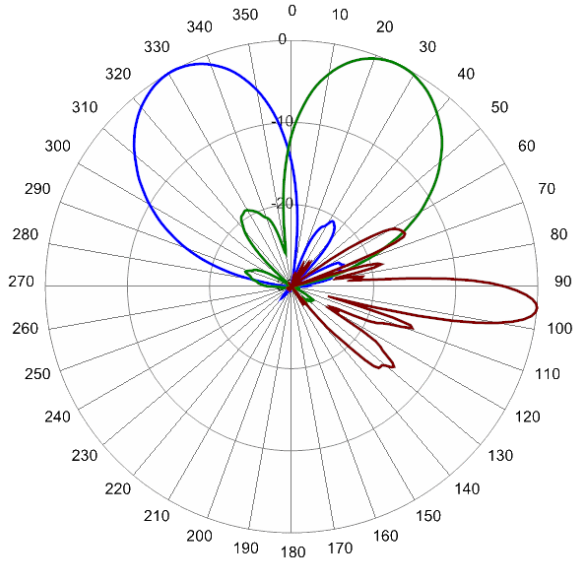
652 MHz Azimuth with Elevation 5°



722 MHz Azimuth with Elevation 5°



1920 MHz Azimuth with Elevation 5°



2110 MHz Azimuth with Elevation 5°

ORDERING

Hybrid Bi-Sector™ Array

HBSA33R-GU6A

Parts & Accessories

HBSA33R-GU6AA-K	Six foot (1.9 m) Hybrid Bi-Sector™ Antenna Array with 4.3-10 female connector, 3 factory installed external BSA-RET200 RET actuators (Type 1 External) and MBK-01 mounting brackets
MBK-01	Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment
BSA-RET200	Type 1 remote electrical tilt actuator
HPA-CBK-AG-RRU	Hybrid Bi-Sector™ antenna to RRU AISG cable kit
HPA-CBK-RA-AG-RRU	Hybrid Bi-Sector™ antenna to RRU AISG right angle cable kit

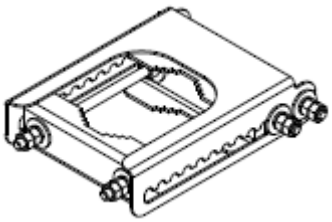
ACCESSORIES

Mounting Bracket Kit

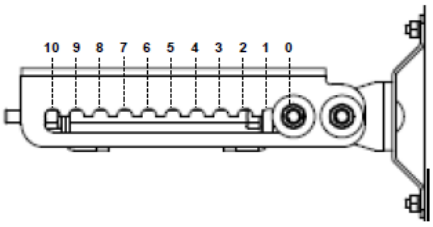
MBK-01

Mechanical

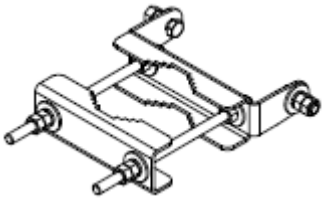
Weight	12.6 lbs (5.7 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lb (54 N·m)
Mechanical Tilt Adjustment	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket

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

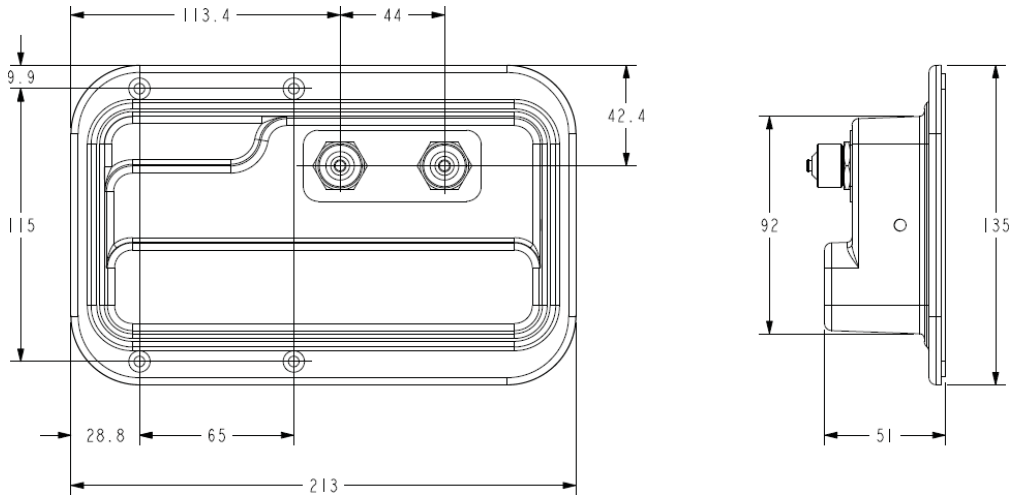
Electrical

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 x 8 pin Daisy Chain
Output Connector	Female 1 x 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=Acrylanitrile Butadiene Styrene



ACCESSORIES

AISG Cable Kit

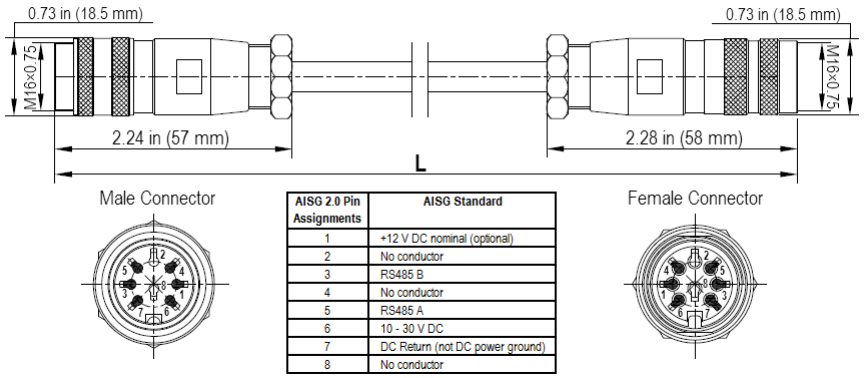
HPA-CBK-AG-RRU

Electrical Specifications

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

Mechanical Specifications

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



AISG 2.0 Pin Assignments	AISG Standard
1	+12 V DC nominal (optional)
2	No conductor
3	RS485 B
4	No conductor
5	RS485 A
6	10 - 30 V DC
7	DC Return (not DC power ground)
8	No conductor

AISG-Male to AISG-Female Jumper Cable

Environmental Specifications

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

ACCESSORIES

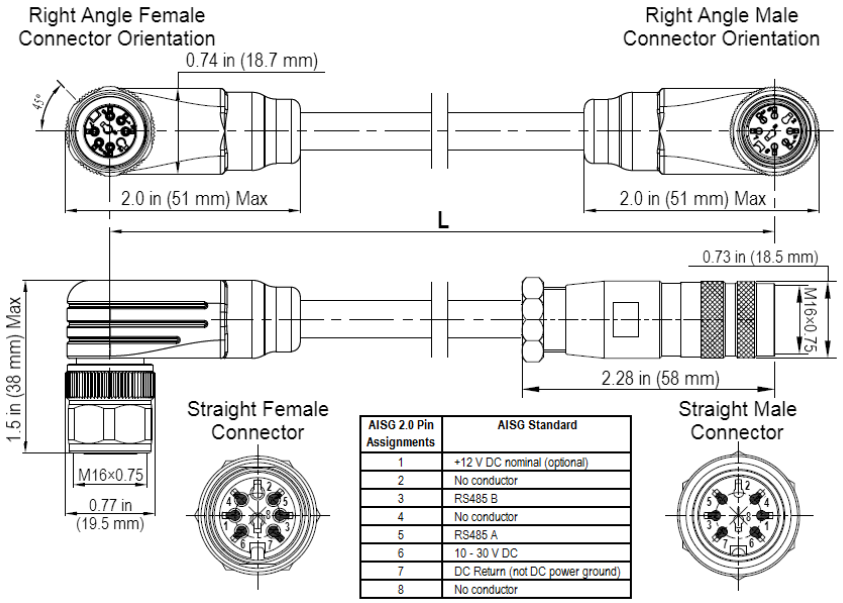
AISG Cable Kit

HPA-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	2	2

Mechanical Specifications



AISG 2.0 Pin Assignments	AISG Standard
1	+12 V DC nominal (optional)
2	No conductor
3	RS485 B
4	No conductor
5	RS485 A
6	10 - 30 V DC
7	DC Return (not DC power ground)
8	No conductor

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

STANDARDS & CERTIFICATIONS

Hybrid Bi-Sector™ Array

HBSA33R-GU6A

Standards & Compliance

Safety	EN 60950-1, UL 60950-1
Emission	EN 55022
Immunity	EN 55024
Environmental	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