



# Antennas

DATA SHEET

## Hybrid Multi-Band Antenna Array

HBSA-M65R-KU-H6



- Unique hybrid phased array combines a standard 65° pattern for the 698-960 MHz frequency band with CCI's patented asymmetric 33° Bi-Sector™ Array beams (optimized for greenfield deployments or matching existing cloverleaf networks) for the 1695-2360 MHz band
- Slim and low weight single panel design supporting 3 beams without mount changes
- Independent adjustable beams provide unmatched optimization flexibility
- Separate Low-band and High-band ports
- 3GPP/AISG 2.0 compliant
- Daisy chaining capability
- Software upgradeable
- Rugged, weather resistant and highly reliable internal design
- Multi band applications – 700 MHz, SMR 800 MHz, Cellular 850 MHz, 900 MHz, PCS 1900 MHz, AWS/AWS-3 1695/2180 MHz, WCS 2305/2360 MHz
- Enables efficient evolution of wireless networks
- Increase site capacity through higher order sectorization
- Avoid carrier-adds and building of new capacity sites
- Boosts data throughput by lowering interference
- Unique hybrid phased array design, maximizes coverage in a standard tri-sector cell plan
- Provides remote control of electrical downtilt of antenna for easier optimization

### Overview

The CCI RET Series Hybrid Multi Band Antenna Array is an LTE ready hybrid phased array that supports multiple sectors (one low band, two high bands) from a single antenna and provides capability for 700 MHz, SMR 800 MHz, Cellular 850 MHz, 900 MHz, PCS 1900 MHz, AWS/AWS-3 1695/2180 MHz and WCS 2300 MHz coverage in a single, compact enclosure. Our unique hybrid design, 6 ft (1.8 m) high and 13.7 inches (0.3 m) wide, combining standard 65° and patented bi-sector technology, maximizes coverage in a standard tri-sector cell plan, provides optimized overlap between pairs of asymmetric beams, lowers soft handover losses in UMTS/HSPA+ and CDMA/EVDO systems, and minimizes interference between sectors. Such an approach enhances data transfer rates within UMTS/LTE and EVDO network sectors and addresses "hotspots" in mobile wireless operator networks for SMR, GSM, CDMA, UMTS and LTE technologies.

The remote electrical tilt (RET) Series Multi Band Hybrid Bi-Sector™ Array 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 sub-beams for easier optimization.

The single panel design of the hybrid phased array offers the opportunity to reduce antenna count and directly replaces 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.



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## Applications

- Upgrade of data-throughput or capacity constrained sites
- Spectrum limited markets
- Deferral of CDMA/EVDO or UMTS//HSPA+ carrier adds
- Spectrum clearing and refarming



# Antennas

## SPECIFICATIONS

### Hybrid Multi-Band Antenna Array

HBSA-M65R-KU-H6

#### Electrical

Ports	2 x Low Band Ports for 698-960 MHz		
Frequency Range	698-806 MHz	824-894 MHz	880-960 MHz
Gain	14.2 dBi	14.4 dBi	14.4 dBi
Azimuth Beamwidth (-3dB)	65°	65°	61°
Elevation Beamwidth (-3dB)	12.7°	11.0°	10.4°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 10°
Elevation Sidelobes (1st Upper)	< -19 dB	< -19 dB	< -18 dB
Front-to-Back Ratio @180°	> 30 dB	> 30 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> 25 dB	> 23 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB
Voltage Standing Wave Ratio(VSWR)	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts	500 watts
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground

Ports	4 x High Band Ports for 1695-2360 MHz			
Frequency Range	1850-1990 MHz	1695-1780/2110-2180 MHz		2305-2360 MHz
Gain	18.5 dBi	17.5 dBi	19.3 dBi	19.6 dBi
Azimuth Beamwidth (-3dB)	35°	38°	30°	28°
Elevation Beamwidth (-3dB)	6.2°	6.7°	5.4°	4.9°
Electrical Downtilt	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -20 dB	< -18 dB	< -17 dB	< -17 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



# Antennas

## SPECIFICATIONS

### Hybrid Multi-Band Antenna Array

HBSA-M65R-KU-H6

#### Mechanical

<b>Dimensions (LxWxD)</b>	68.1x13.7x8.5 in (1730x348x216 mm)
<b>Survival Wind Speed</b>	> 150 mph (> 241 kph)
<b>Front Wind Load</b>	217 lbs (967 N) @ 100 mph (161 kph)
<b>Side Wind Load</b>	147 lbs (655 N) @ 100 mph (161 kph)
<b>Equivalent Flat Plate Area</b>	8.5 ft <sup>2</sup> (0.8 m <sup>2</sup> )
<b>Weight *</b>	44.5 lbs (20.2 kg)
<b>RET System Weight</b>	5.0 lbs (2.3 kg)
<b>Connector</b>	6 x 7-16 DIN female long neck
<b>Mounting Pole</b>	2 to 5 in (5 to 12 cm)

\* Weight excludes mounting and RET



# Antennas

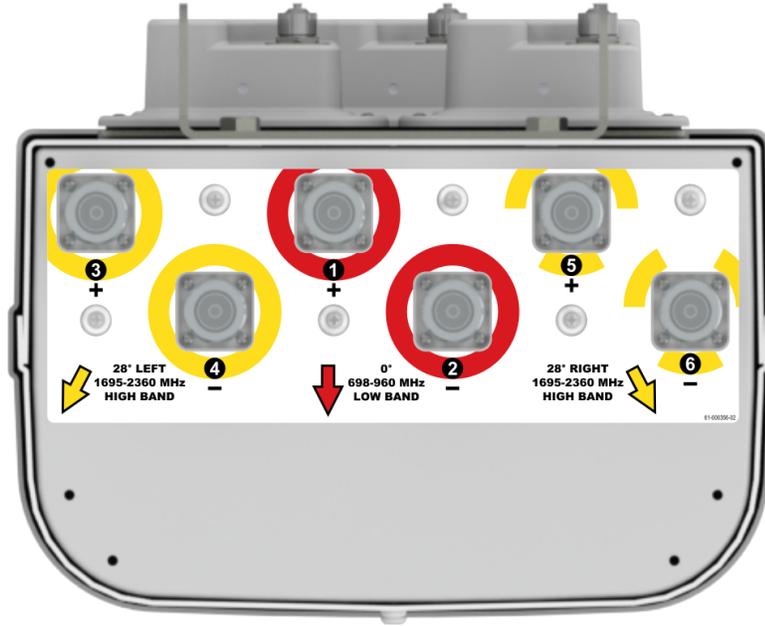
## SPECIFICATIONS

### Hybrid Multi-Band Antenna Array

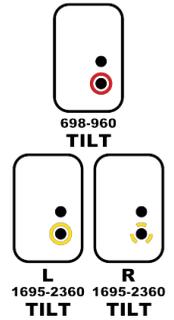
HBSA-M65R-KU-H6

Bottom View

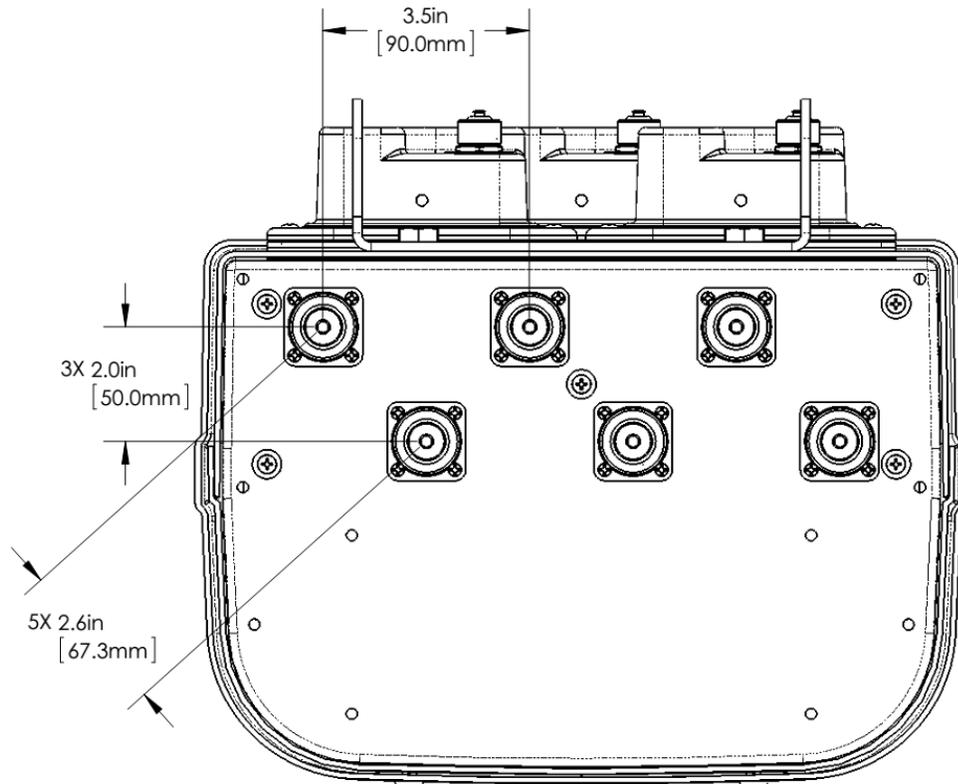
RET Connection Diagram



### CONNECT RET ACTUATORS AS SHOWN BELOW



Connector Spacing





# Antennas

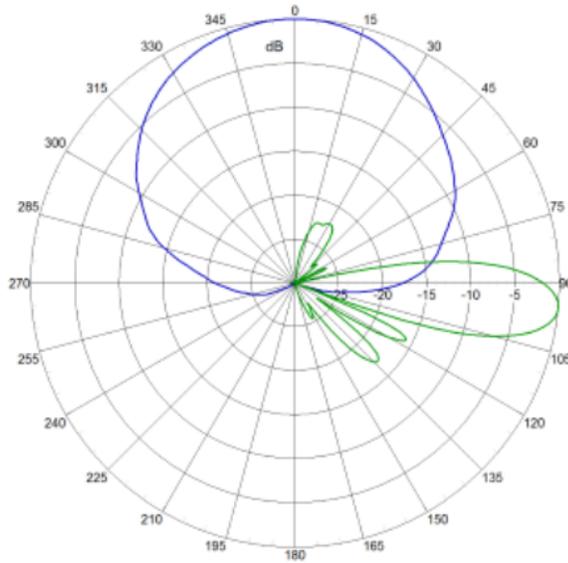
SPECIFICATIONS

## Hybrid Multi-Band Antenna Array

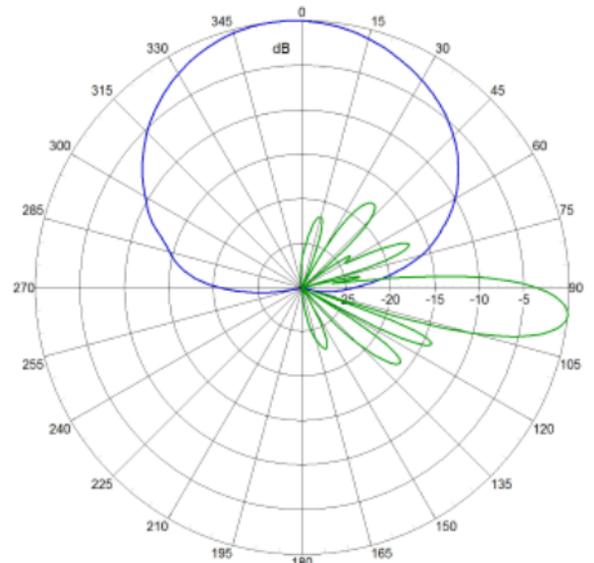
HBSA-M65R-KU-H6

Typical Antenna Patterns

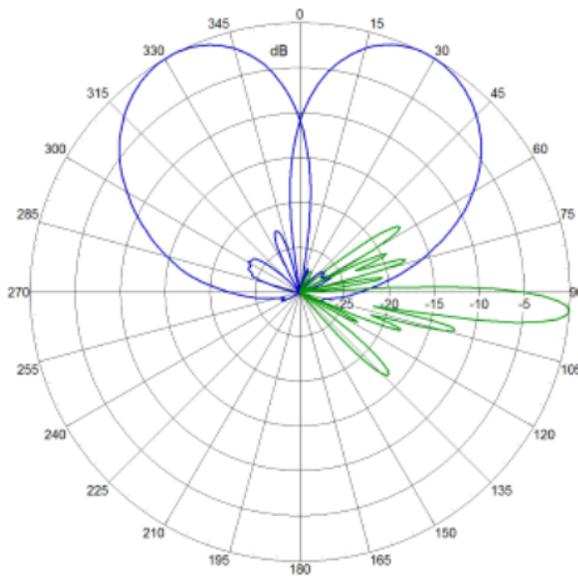
For detailed information on additional antenna patterns, contact customer support at [support@cciproducts.com](mailto:support@cciproducts.com)



719 MHz Azimuth / Elevation 5°



870 MHz Azimuth / Elevation 5°



1920 MHz Azimuth / Elevation 4°



# Antennas

ORDERING

## Hybrid Multi-Band Antenna Array

HBSA-M65R-KU-H6

### Parts & Accessories

<b>HBSA-M65R-KU-H6</b>	6 foot (1.7 m) Hybrid Bi-Sector™ Antenna Array with 3 factory-installed RET200 actuators
<b>HBSA-M65R-KU-H6-K</b>	Antenna kit with 3 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>HPA-CBK-AG-RRU</b>	HexPort antenna to RRU AISG cable kit
<b>HPA-CBK-RA-AG-RRU</b>	HexPort antenna to RRU AISG right angle cable kit



# Antennas

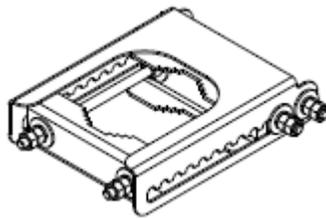
ACCESSORIES

## Mounting Bracket Kit

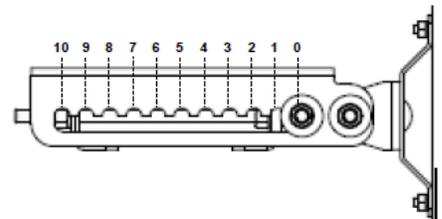
MBK-01

Mechanical

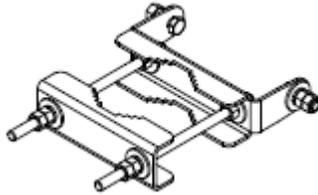
<b>Weight</b>	12.6 lbs (5.7 kg)
<b>Hinge Pitch</b>	47.25 in (1200 mm)
<b>Mounting Pole Dimension</b>	2 to 5 in (5 to 12 cm)
<b>Fastener Size</b>	M12
<b>Installation Torque</b>	40 ft·lb (54 N·m)
<b>Mechanical Tilt Adjustment</b>	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket



# Antennas

ACCESSORIES

## 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

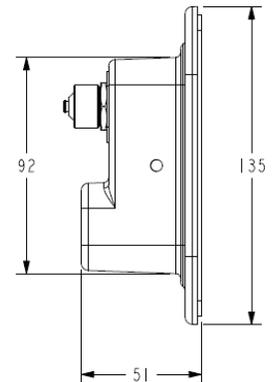
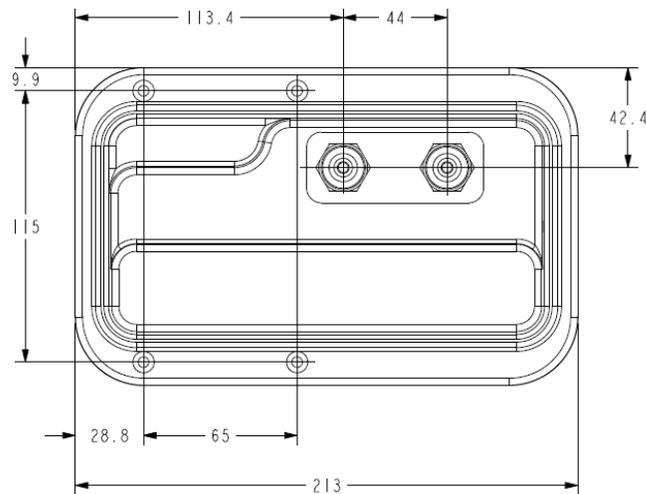
### Electrical

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





# Antennas

ACCESSORIES

AISG Cable Kit

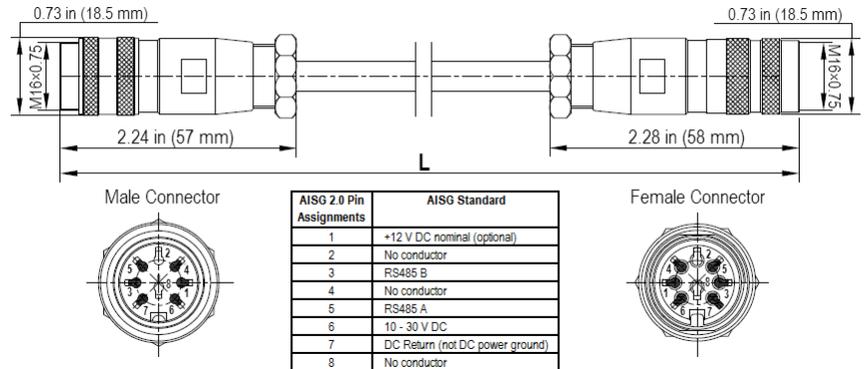
HPA-CBK-AG-RRU

## 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 $\approx$ 1.84 ft-lbs (2.5 N-m)	Hand tighten only $\approx$ 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



# Antennas

ACCESSORIES

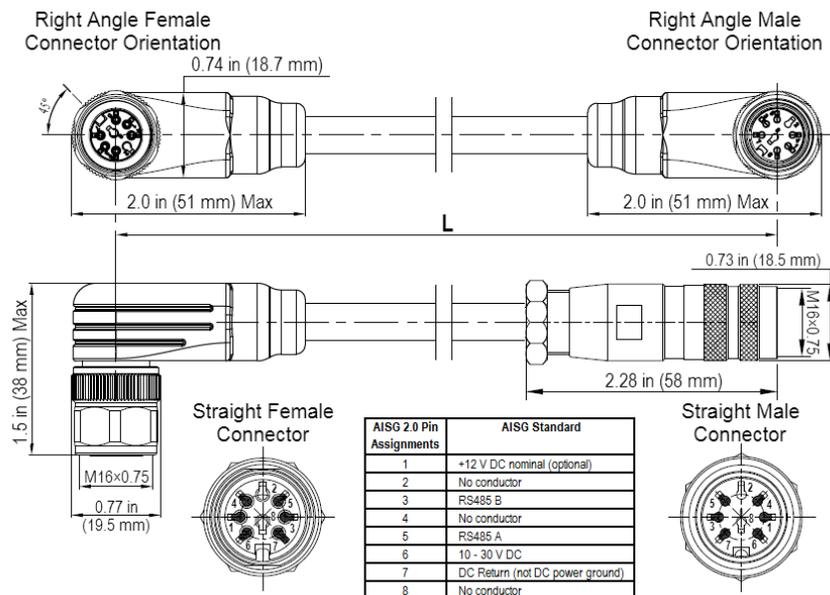
AISG Cable Kit

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 $\approx$ 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 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



# Antennas

## STANDARDS & CERTIFICATIONS

### Hybrid Multi-Band Antenna Array

HBSA-M65R-KU-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

