



Antennas

DATA SHEET

Hybrid Bi-Sector™ Array

HBSA-M65R-BU-H6



- Unique hybrid phase array combining standard 65° over a frequency range of (698-894 MHz) and asymmetric 33° Bi-Sector array over a frequency range of (1710-2360 MHz), optimized to match existing cloverleaf (65°) deployments.
- 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, PCS 1900 MHz, AWS 1710/2155 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 industry first 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, PCS 1900 MHz, AWS 1710/2155 MHz and WCS 2300 MHz coverage in a single, compact enclosure. Our unique hybrid design, 6 ft (1.8 m) high and 12.8 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 9001:2008 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.



Antennas

DATA SHEET

Hybrid Bi-Sector™ Array

HBSA-M65R-BU-H6

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

Superseded



Antennas

Hybrid Bi-Sector™ Array

HBSA-M65R-BU-H6

SPECIFICATIONS

Electrical

Ports	2 × Low Band Ports for 698-894 MHz			4 × High Band Ports for 1710-2360 MHz		
Frequency Range	698-806 MHz	824-894 MHz	1850-1990 MHz	1710-1755/2110-2155 MHz	2305-2360 MHz	
Gain	14.5 dBi	15.2 dBi	18.3 dBi	17.3 dBi	19.1 dBi	19.2 dBi
Azimuth Beamwidth (-3dB)	68.0°	65.0°	33.0°	36.0°	28.5°	27.0°
Elevation Beamwidth (-3dB)	12.0°	10.5°	5.7°	6.2°	5.1°	4.5°
Electrical Downtilt	2° to 10°	2° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -18 dB	< -18 dB	< -18 dB	< -18 dB	< -18 dB	< -16 dB
Front-to-Back Ratio @180°	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Front-to-Back Ratio over ± 20°	> 25 dB	> 25 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> 25 dB	> 22 dB	> 22 dB	> 22 dB	> 20 dB
Cross-Polar Discrimination (at ± 30°)	> 22 dB	> 20 dB	> 20 dB	> 20 dB	> 20 dB	> 19 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 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	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 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°	Dual Pol 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical

Dimensions (LxWxD)	72.0x12.8x9.0 in (1829x325x229 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	219 lbs (976 N) @ 100 mph (161 kph)
Side Wind Load	165 lbs (734 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	8.6 ft ² (0.8 m ²)
Weight *	44.4 lbs (20.2 kg)
RET System Weight	5.0 lbs (2.3 kg)
Connector	6 × 7-16 DIN female long neck
Mounting Pole	2 to 5 in (5 to 12 cm)

* Weight excludes mounting and RET



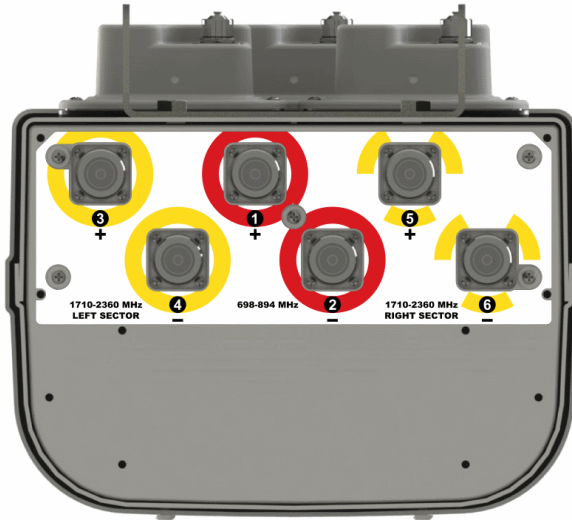
Antennas

Hybrid Bi-Sector™ Array

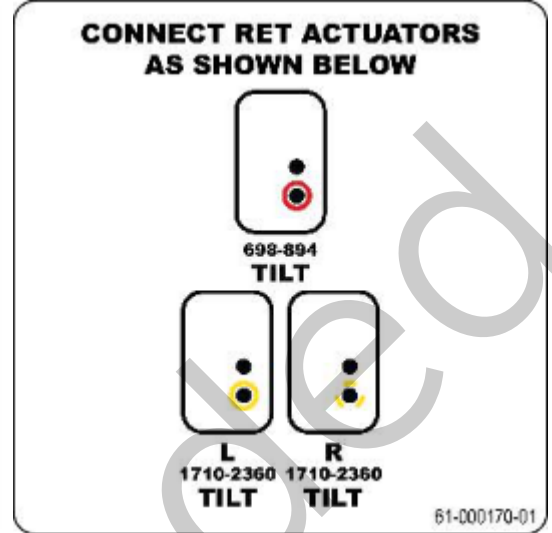
HBSA-M65R-BU-H6

SPECIFICATIONS

Bottom View

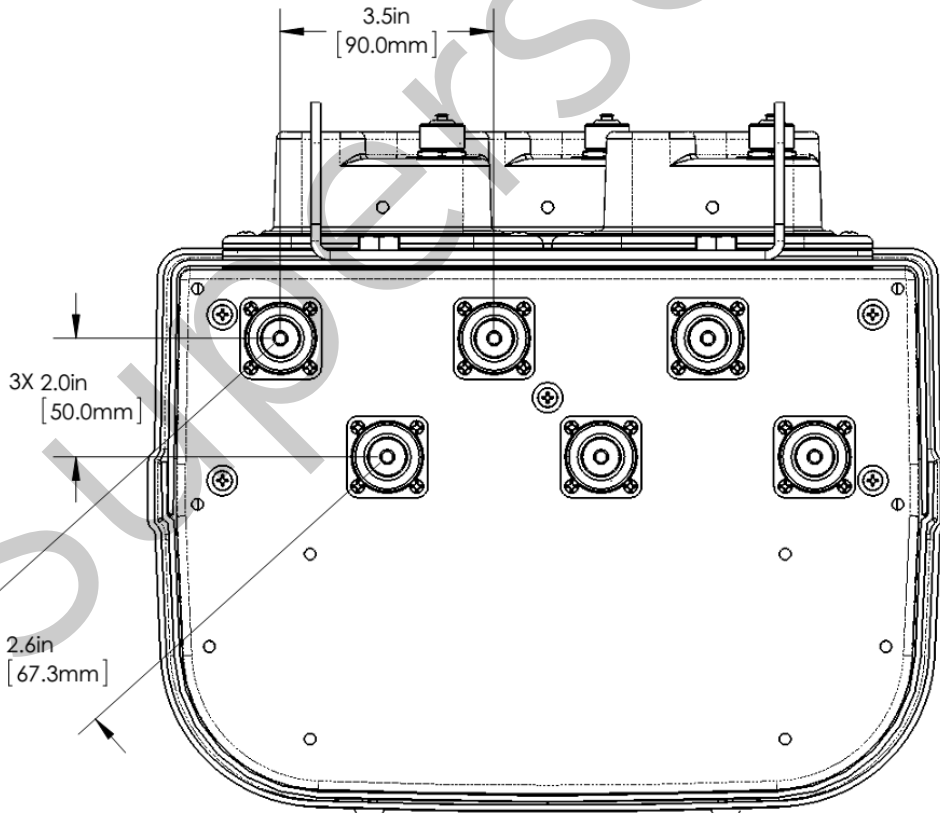


RET Connection Diagram



Mechanical

Connector Spacing





Antennas

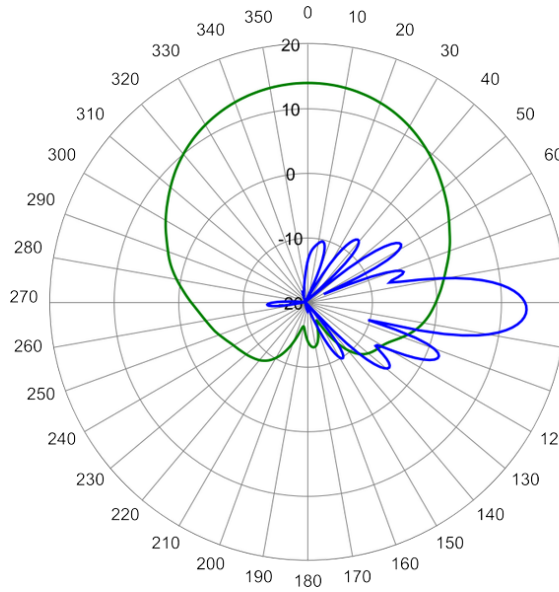
SPECIFICATIONS

Hybrid Bi-Sector™ Array

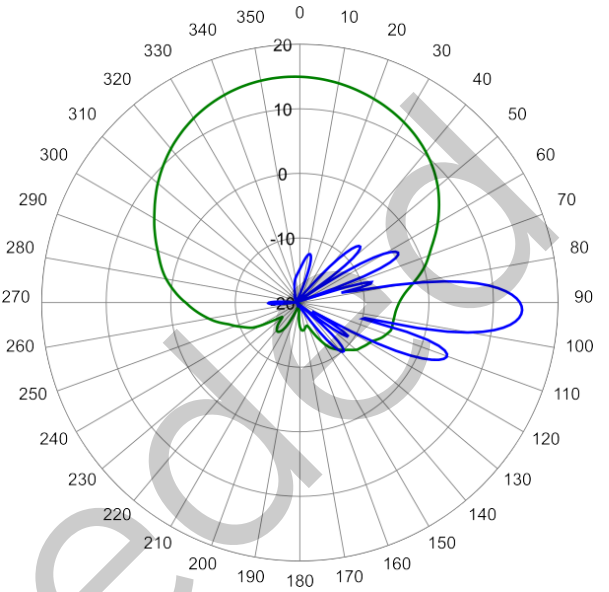
HBSA-M65R-BU-H6

Typical Antenna Patterns

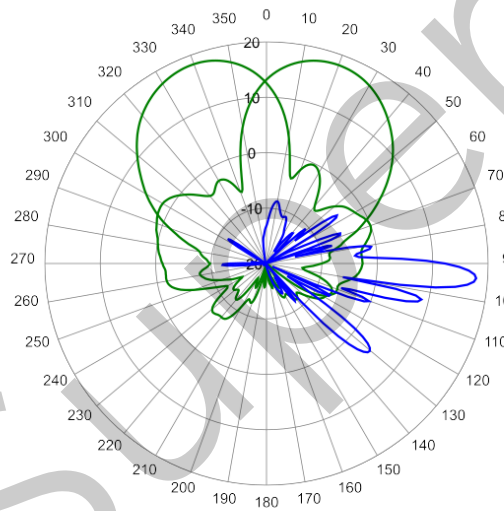
For detailed information on additional antenna patterns, contact customer support.



713 MHz Azimuth Elevation 2°



830 MHz Azimuth Elevation 2°



1910 MHz Azimuth Elevation 4°



Antennas

ORDERING

Hybrid Bi-Sector™ Array

HBSA-M65R-BU-H6

Parts & Accessories

HBSA-M65R-BU-H6	Six foot (1.8 m) Hybrid Bi-Sector array and 3 factory installed BSA-RET200 RET actuators
HBSA-M65R-BU-H6-K	Antenna kit with 3 factory installed RET actuators and MBK-01 mounting bracket
MBK-01	Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment
BSA-RET200	Remote electrical tilt actuator
HPA-CBK-AG-RRU	HexPort antenna to RRU AISG cable kit
HPA-CBK-RA-AG-RRU	HexPort antenna to RRU AISG right angle cable kit

Superseded



Antennas

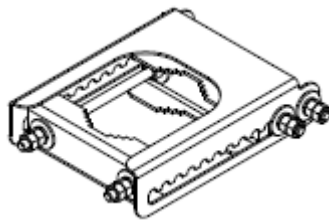
ACCESSORIES

Mounting Bracket Kit

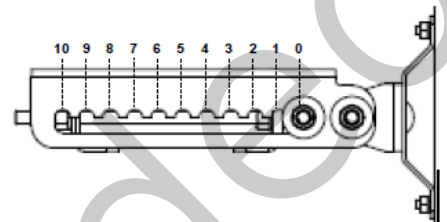
MBK-01

Mechanical

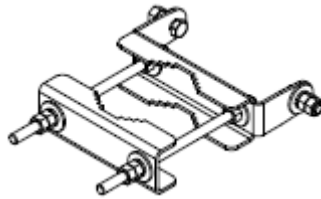
Weight	12.6 lbs (5.7 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lb (54 Nm)
Mechanical Tilt Adjustment	0° - 10°



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 (per AISG 1.1)	Type 1
Adjustment Cycles	>10,000 cycles
Tilt Accuracy	±0.1°
Temperature Range	-40° C to 70° C

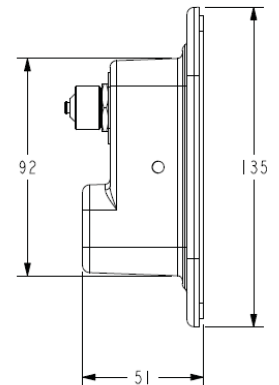
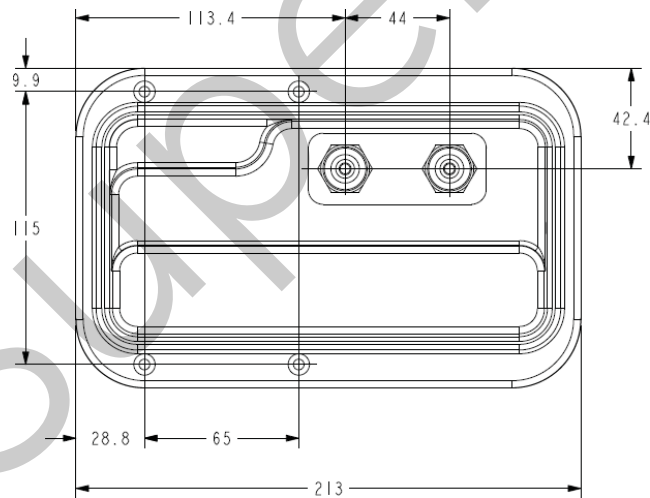
Electrical

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

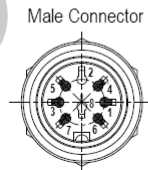
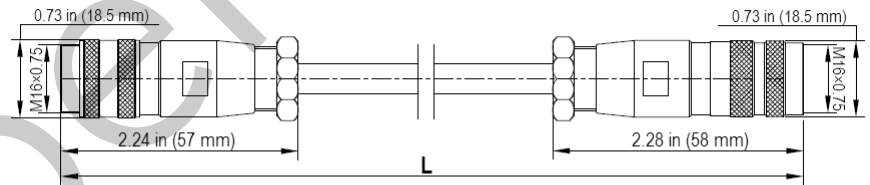
HPA-CBK-AG-RRU

Electrical Specifications

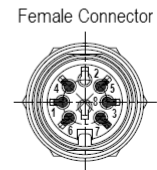
Individual Cable Part Number	AISGC-M-F-18	AISGC-M-F-10FT
Cable style	UL2464	UL2464
Protocol	AISG 1.1 and AISG 2.0	AISG 1.1 and AISG 2.0
Maximum voltage	300 V	300 V
Rated current	5 A at 104° F (40° C)	5 A at 104° F (40° C)

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 \approx 1.84 ft-lbs (2.5 Nm)	Hand tighten only \approx 1.84 ft-lbs (2.5 Nm)
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	RS485 Ground
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



Antennas

ACCESSORIES

AISG Cable Kit

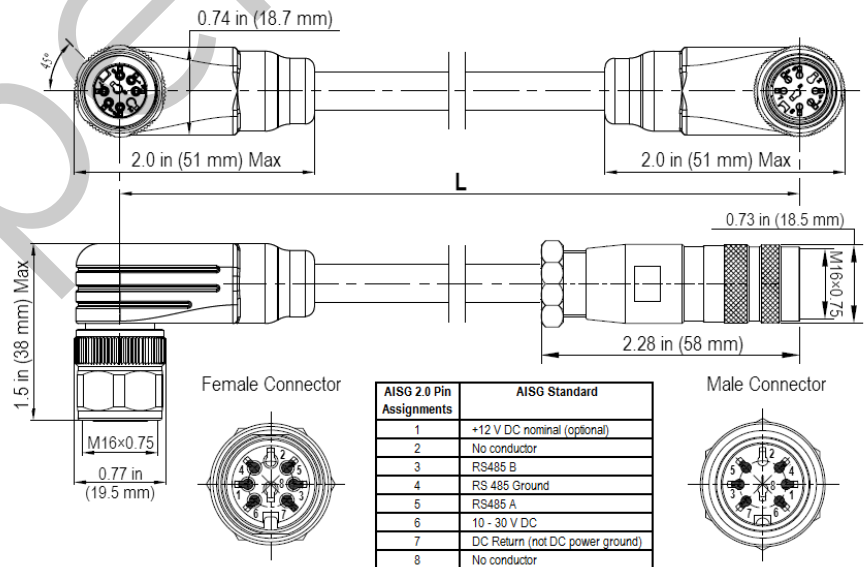
HPA-CBK-RA-AG-RRU

Electrical Specifications

Individual Cable Part Number	AISGC-MRA-FRA-20	AISGC-M-FRA-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-MRA-FRA-20	AISGC-M-FRA-10FT
Cables per kit	2	2
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
Tightening torque	Hand tighten only ≈ 1.84 ft-lbs (2.5 Nm)	Hand tighten only ≈ 1.84 ft-lbs (2.5 Nm)
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	20 in (508 mm)	120 in (3048 mm)
Weight	0.23 lbs (0.10 kg)	0.77 lbs (0.35 kg)
Minimum bend radius	3.9 in (100 mm)	3.9 in (100 mm)



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



Antennas

ACCESSORIES

AISG Cable Kit

HPA-CBK-RA-AG-RRU

Environmental Specifications

Individual Cable Part Number	AISGC-MRA-FRA-20	AISGC-M-FRA-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

Superseded



Antennas

STANDARDS & CERTIFICATIONS

Hybrid Bi-Sector™ Array

HBSA-M65R-BU-H6

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 9001:2008

