



# Antennas

DATA SHEET

## Hybrid Bi-Sector™ Array

12HBSAR-BU6NA



- Six foot (1.98 m) tall and 19.5" (496 mm) wide, multiband, Twelve port Hybrid Bi-Sector™ Antenna. Deploying a high performing 65° azimuth beamwidth covering 698-896 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 four wide low band ports covering 698-896 MHz in a single antenna
- Full Spectrum Compliance for 698-896 MHz /1695-2400 MHz
- Provides a pair of 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, Type 17 integrated AISG 2.0 compliant Remote Electrical Tilt (RET)

### Overview

This version of the CCI Hybrid Bi-Sector™ Multiband Array is a Twelve port antenna, with eight wide high band ports covering 1695-2400 MHz and four wide low band ports covering 698-896 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 4x4 Multiple-input Multiple-output in the low band. The CCI Hybrid Bi-Sector™ Array utilizes three Type 17 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 single 4x4 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

12HBSAR-BU6NA

#### Electrical

Ports	4 × Low Band Ports for 698-896 MHz		
Frequency Range	698-806 MHz	790-862 MHz	824-896 MHz
Gain <sup>1</sup>	14.4 dBi	14.5 dBi	14.7 dBi
Gain (Average) <sup>2</sup>	13.5 dBi	14.0	14.2
Azimuth Beamwidth (-3dB)	76°	74°	71°
Elevation Beamwidth (-3dB)	12.5°	11.3°	10.9°
Electrical Downtilt	2° to 12°	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	< -20 dB	< -20 dB	< -20 dB
Front-to-Back Ratio @180°	> 28 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> dB	> 25 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)	≤ -153 dBc	≤ -153 dBc	≤ -153 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

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

<sup>2</sup>Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.

All specifications are subject to change without notice.

Ports	8 × High Band Ports for 1695-2400 MHz			
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz
Gain <sup>1</sup>	17.8 dBi	18.4 dBi	18.5 dBi	19.2 dBi
Gain Average <sup>2</sup>	16.7 dBi	17.5 dBi	17.9 dBi	18.4 dBi
Azimuth Beamwidth (-3dB)	37°	34°	32°	29°
Elevation Beamwidth (-3dB)	7.9°	7.1°	6.6°	5.7°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 10°	0° to 10°
Elevation Sidelobes (1st Upper)	< -18 dB	< -17 dB	< -17 dB	< -18 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination (at Peak)	> 25 dB	> 25 dB	> 25 dB	> 23 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)	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

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

<sup>2</sup>Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.

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## SPECIFICATIONS

### Hybrid Bi-Sector™ Array

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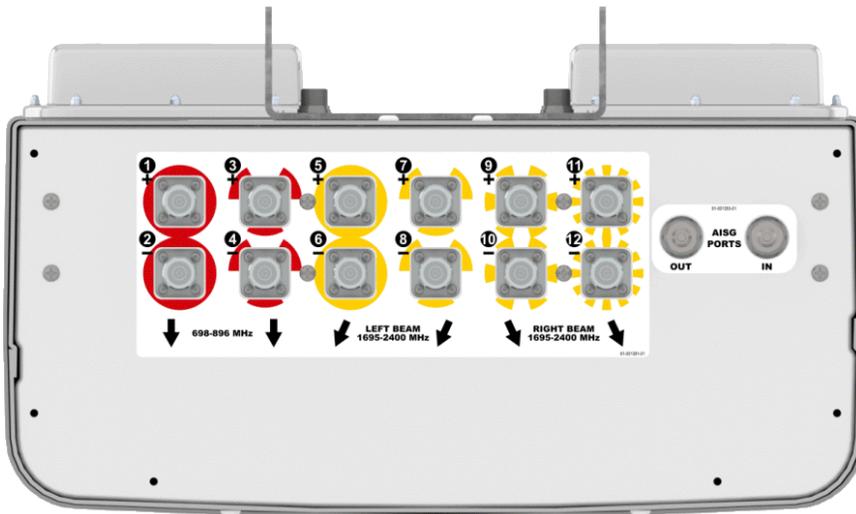
#### Mechanical

<b>Dimensions (LxWxD)</b>	78.0x19.5x9.1 in (1981x496x230 mm)
<b>Survival Wind Speed</b>	> 150 mph (> 241 kph)
<b>Front Wind Load</b>	343 lbs (1525 N) @ 100 mph (161 kph)
<b>Side Wind Load</b>	182 lbs (812 N) @ 100 mph (161 kph)
<b>Equivalent Flat Plate Area</b>	13.4 ft <sup>2</sup> (1.2 m <sup>2</sup> )
<b>Weight*</b>	86.0 lbs (39.0 kg)
<b>Connector</b>	12 x 4.3-10 female
<b>Mounting Pole</b>	2 to 5 in (5 to 12 cm)

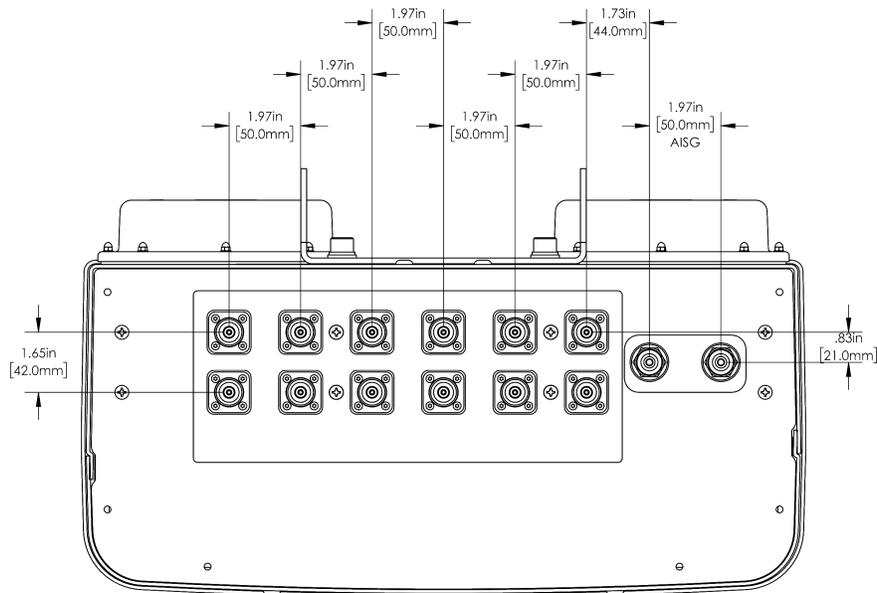
\* Weight excludes mounting kit

Bottom View

12HBSAR-BU6NAA



Connector Spacing





# Antennas

## Hybrid Bi-Sector™ Array

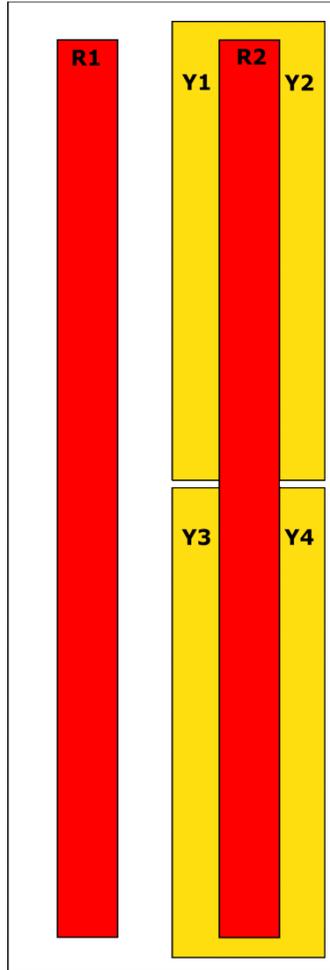
12HBSAR-BU6NA

### SPECIFICATIONS

#### Mechanical

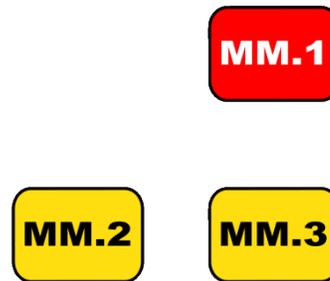
RET to Array Configuration

#### Top of antenna Viewed from rear



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

Top of antenna



Array	Ports	Freq (MHz)	Ports controlled by common RET	AISG RET UID
R1	1, 2	698-896	1, 2, 3, 4	C1xxxxxxxMM.1
R2	3, 4	698-896		
Y1	5, 6	1695-2400	5, 6, 7, 8	C1xxxxxxxMM.2
Y3	7, 8	1695-2400	Left Beams	
Y2	9, 10	1695-2400	9, 10, 11, 12	C1xxxxxxxMM.3
Y4	11, 12	1695-2400	Right Beams	

Array color boxes are not true depictions of size or position.



# Antennas

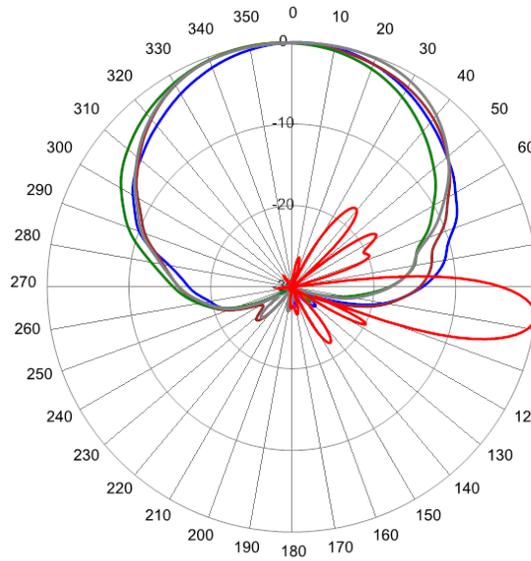
## SPECIFICATIONS

### Hybrid Bi-Sector™ Array

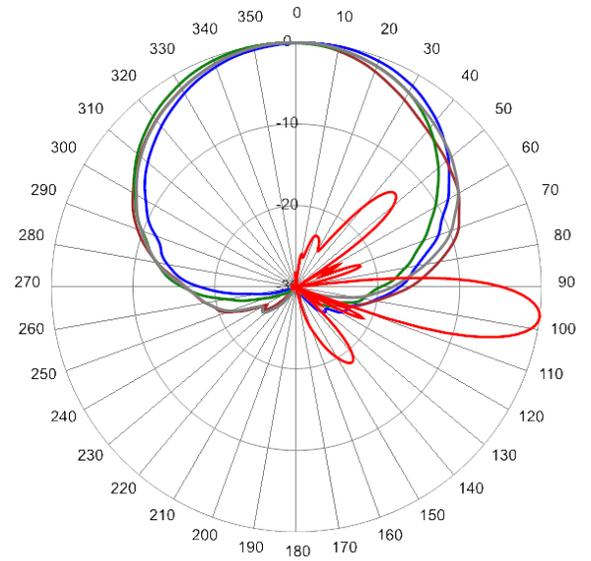
12HBSAR-BU6NA

#### Typical Antenna Patterns

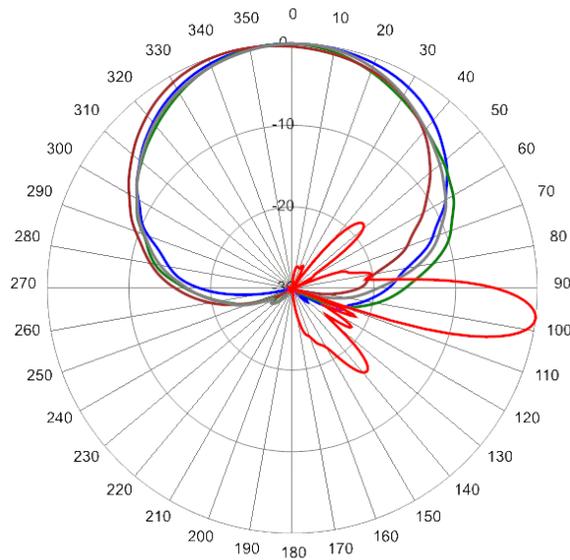
For detailed information on additional antenna patterns, contact customer support at [support@cciproducts.com](mailto:support@cciproducts.com)



750 MHz Azimuth with Elevation 7°



850 MHz Azimuth with Elevation 7°



880 MHz Azimuth with Elevation 7°



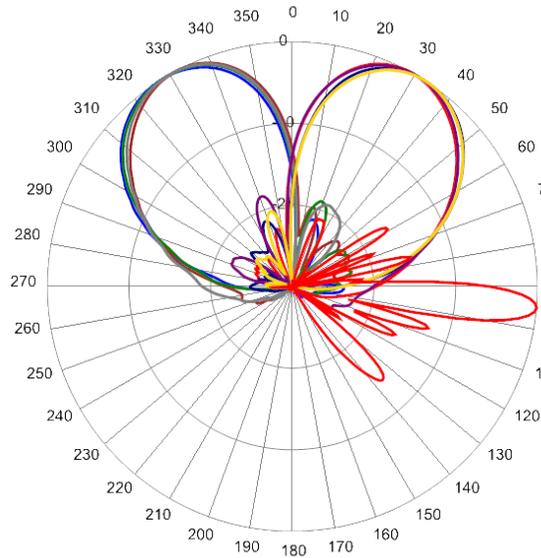
# Antennas

SPECIFICATIONS

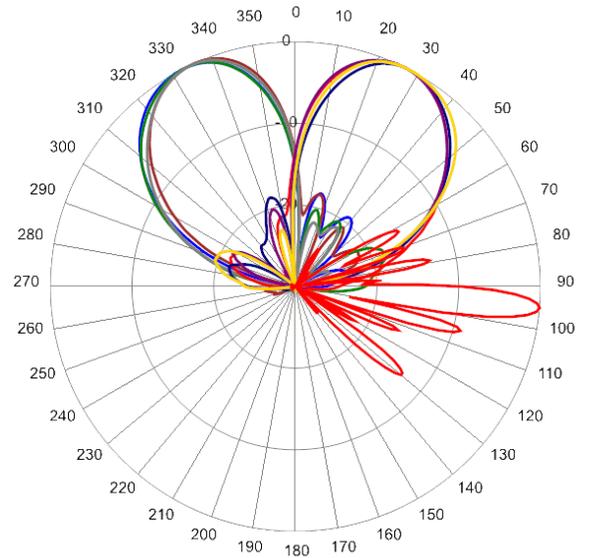
Hybrid Bi-Sector™ Array

12HBSAR-BU6NA

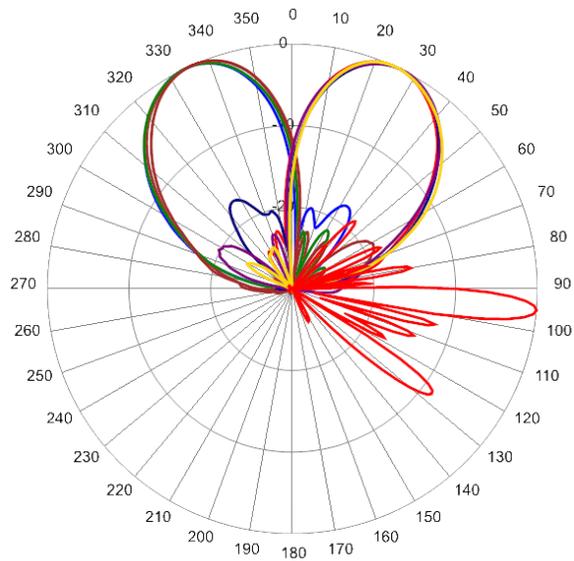
Typical Antenna Patterns



1920 MHz Azimuth with Elevation 5°



2170 MHz Azimuth with Elevation 5°



2320 MHz Azimuth with Elevation 5°



# Antennas

ORDERING

Hybrid Bi-Sector™ Array

12HBSAR-BU6NA

Parts & Accessories

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<b>12HBSAR-BU6NAA-K</b>	Six foot (1.9 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>	MBK-01 Mounting Kit with 0° - 10° mechanical tilt
<b>MBK-16</b>	MBK-16 Mounting Kit with fixed 0° mechanical tilt
<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

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# Antennas

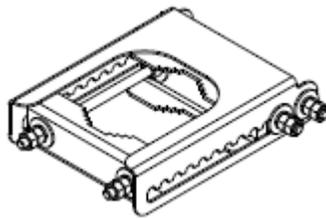
ACCESSORIES

## Mounting Bracket Kit

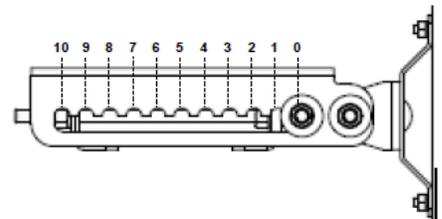
MBK-01

Mechanical

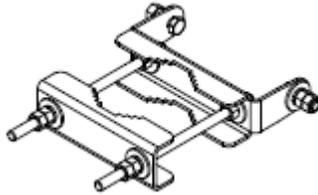
<b>Weight</b>	12.6 lbs (5.7 kg)
<b>Hinge Pitch</b>	47.25 in (1200 mm)
<b>Mounting Pole Dimension</b>	2 to 5 in (5 to 12 cm)
<b>Fastener Size</b>	M12
<b>Installation Torque</b>	40 ft·lb (54 N·m)
<b>Mechanical Tilt Adjustment</b>	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket



# Antennas

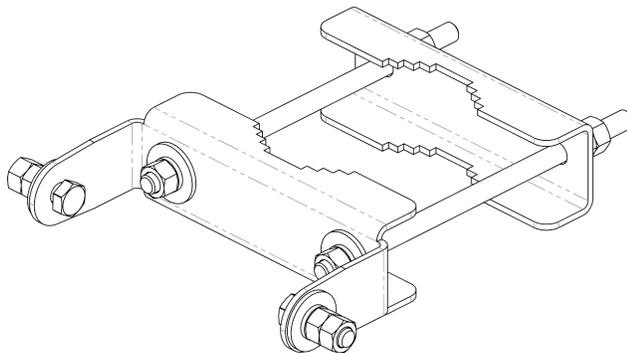
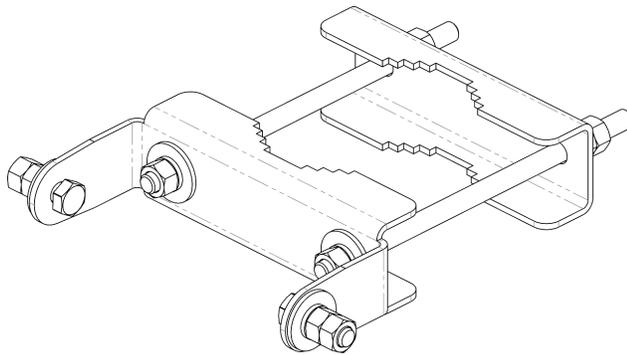
ACCESSORIES

## 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

## 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	±0.1°
Temperature Range	-40° C to 70° C

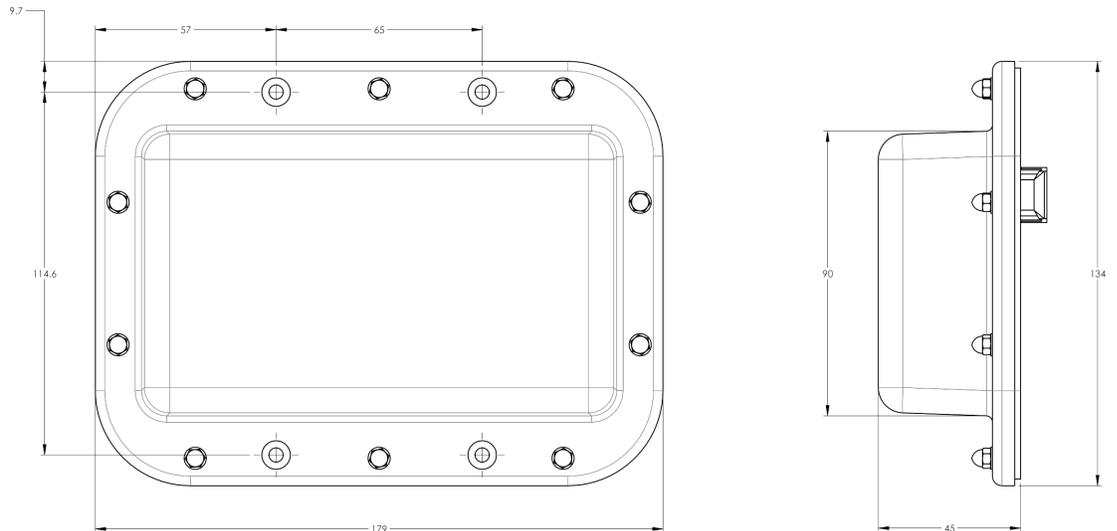
### Electrical

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

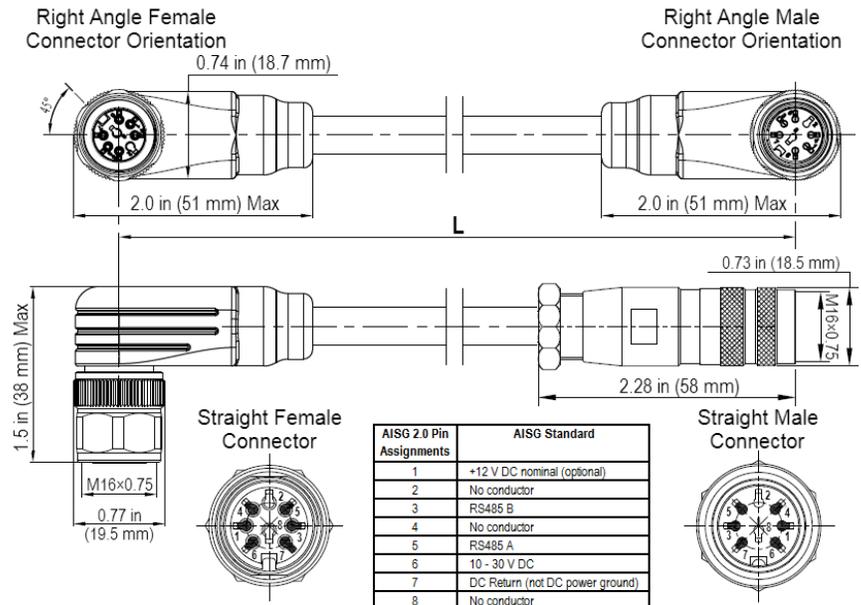
### AISGC-M-F-xFT

#### Electrical Specifications

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

#### Mechanical Specifications

<b>Individual Cable Part Number</b>	AISGC-M-F-x(FT)
<b>Cables per kit</b>	1
<b>Connectors</b>	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 Nm)
<b>Construction</b>	Shielded (Tinned Copper Braid)
<b>Braid coverage</b>	85%
<b>Jacket Material</b>	Matte Polyurethane (Black)
<b>Conductors</b>	1 twisted pair - 24 AWG 3 conductors - 19 AWG AWM style 2464
<b>Cable Diameter</b>	0.307 in (7.8 mm)
<b>Length</b>	See order details
<b>Minimum bend radius</b>	3.15 in (80 mm)



AISG-Male to AISG-Female Jumper Cable



# Antennas

ACCESSORIES

AISG Cable

AISGC-M-F-xFT

Environmental Specifications

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



# Antennas

## STANDARDS & CERTIFICATIONS

### Hybrid Bi-Sector™ Array

12HBSAR-BU6NA

#### 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

