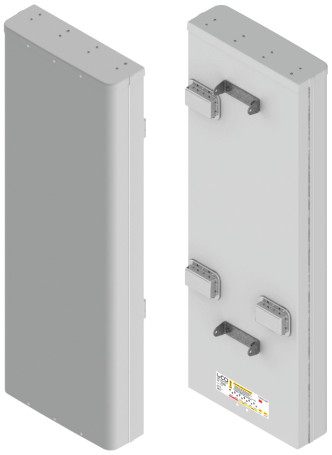
Antennas

MultiPort Series

DATA SHEET

TriBand Twelve-Port Antenna

TPA65R-KE6G



- Patented LEGO Complimentary Array Topology allows for significantly higher gain in the Low Band (LB) and Mid Band (MB) arrays, against similar sized competing products
- Patented LEGO Complimentary Array Topology solution provides an excellent alternative against Air Dielectric topology products
- Six foot (1.8 m) TriBand, twelve port antenna with a 65° azimuth beamwidth covering 698-960 MHz and 1695-2690 MHz frequencies
- Eight wide mid band ports covering 1695-2690 MHz and four wide low band ports covering 698-960 MHz in a single antenna enclosure
- Full Spectrum Compliance 698-960 MHz / 1695-2690 MHz
- LTE Optimized FBR and SPR performance, providing for an efficient use of valuable radio capacity
- LTE Optimized Boresight and Sector XPD and USL performance, essential for LTE Performance
- Exceeds minimum PIM performance requirements
- Equipped with 4.3-10 connectors
- Equipped with 3 field replaceable, integrated AISG 2.0 compliant Remote Electrical Tilt (RET) Controllers (Type 17 Internal)

Overview

The CCI 12-Port 65° TriBand array is a twelve port antenna, with eight wide mid band (MB) ports covering 1695-2690 MHz and four wide low band (LB) ports covering 698-960 MHz. The antenna provides the capability to deploy Dual 4x4 Multiple-input Multiple-output (MIMO) in the MB and 4X4 MIMO across low band ports. The CCI 12-Port 65° MB ports have independent tilt control between first and second set of 4X4 MIMO MB antenna arrays.

In this three RET configuration, the 1st RET is dedicated for the four LB ports. The 2nd RET is dedicated to the 1st 4X4 MIMO MB ports and the 3rd RET is dedicated to the second 4X4 MIMO MB ports. This RET arrangement allows for complete flexibility in coverage control between left and right mid band antenna arrays.

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 4x4 MIMO for the Mid Band and 4X4 MIMO Low Band ports
- Ready for Network Standardization on 4.3-10 connectors
- With CCI's TriBand antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs

MultiPort Series

SPECIFICATIONS

TriBand Twelve-Port Antenna

TPA65R-KE6G

Electrical

Ports	4 x Low Band Ports for 698-960 MHz			
Frequency Range	698-806 MHz	790-862 MHz	824-896 MHz	880-960 MHz
Gain	15.0 dBi	15.4 dBi	15.5 dBi	15.9 dBi
Azimuth Beamwidth (-3dB)	62°	58°	57°	53°
Elevation Beamwidth (-3dB)	13.0°	12.2°	11.8°	11.2°
Electrical Downtilt	0° to 12°	0° to 12°	0° to 12°	0° to 12°
Elevation Sidelobes (1st Upper)	<-16 dB	<-16 dB	<-17 dB	<-17 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination at Peak	> 30 dB	> 30 dB	> 30 dB	> 30 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 Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground

BASTA Electrical Specifications				
Frequency Range	698-806 MHz	790-862 MHz	824-896 MHz	880-960 MHz
Gain over all Tilts (dBi)	14.3	14.9	15.0	15.2
Gain over all Tilts Tolerance (dB)	0.5	0.3	0.3	0.4
Gain at Low-Tilt (dBi)	14.3	14.9	15.1	15.4
Gain at Mid-Tilt (dBi)	14.3	14.9	15.0	15.3
Gain at High-Tilt (dBi)	14.2	14.8	14.9	15.1
Azimuth Beamwidth Tolerance (°)	8.3	3.7	4.0	4.6
Elevation Beamwidth Tolerance (°)	0.7	0.5	0.6	0.5
Electrical Downtilt Deviation (°)	0.7	0.6	0.6	0.7
First Upper Sidelobe Suppression (dB)	14.2	14.4	14.4	14.7
Upper Sidelobe Suppression Peak to 20°(dB)	14.3	14.4	14.7	16.1
Front-to-Back Ratio over ±20° (dB)	26.3	29.4	28.1	28.0
Cross-polar Discrimination at ±60° (dB)	12.1	9.4	8.7	6.8

** Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.*
All specifications are subject to change without notice.

TriBand Twelve-Port Antenna

SPECIFICATIONS

TPA65R-KE6G

Electrical

Ports	8 x Mid Band Ports for 1695-2690 MHz				
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Gain	18.5 dBi	18.6 dBi	19.1 dBi	19.6 dBi	19.7 dBi
Azimuth Beamwidth (-3dB)	63°	60°	58°	56°	56°
Elevation Beamwidth (-3dB)	5.0°	4.7°	4.4°	3.9°	3.5°
Electrical Downtilt	0° to 8°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	<-18 dB	<-20 dB	<-20 dB	<-19 dB	<-20 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination at Peak	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Cross-Polar Port-to-Port Isolation	> 18 dB	> 18 dB	> 20 dB	> 23 dB	> 20 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 Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 45°	Dual Linear 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

BASTA Electrical Specifications					
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Gain over all Tilts (dBi)	17.6	18.1	18.5	18.8	18.9
Gain over all Tilts Tolerance (dB)	0.6	0.4	0.4	0.6	0.7
Gain at Low-Tilt (dBi)	17.6	18.1	18.5	18.8	19.1
Gain at Mid-Tilt (dBi)	17.6	18.2	18.6	18.9	19.1
Gain at High-Tilt (dBi)	17.6	18.2	18.5	18.7	18.7
Azimuth Beamwidth Tolerance (°)	9.8	4.0	4.1	10.0	5.9
Elevation Beamwidth Tolerance (°)	0.4	0.2	0.3	0.2	0.2
Electrical Downtilt Deviation (°)	1.0	1.0	1.0	1.0	1.0
First Upper Sidelobes Suppression (dB)	14.7	16.6	17.0	15.8	17.0
Upper Sidelobe Suppression Peak to 20°(dB)	14.1	15.9	16.2	15.9	17.0
Front-to-Back Ratio over ±20° (dB)	27.4	26.5	27.1	28.5	26.9
Cross-polar Discrimination at ±60° (dB)	7.8	7.6	7.9	6.5	4.2

** Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V11.1.*
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SPECIFICATIONS

TriBand Twelve-Port Antenna

TPA65R-KE6G

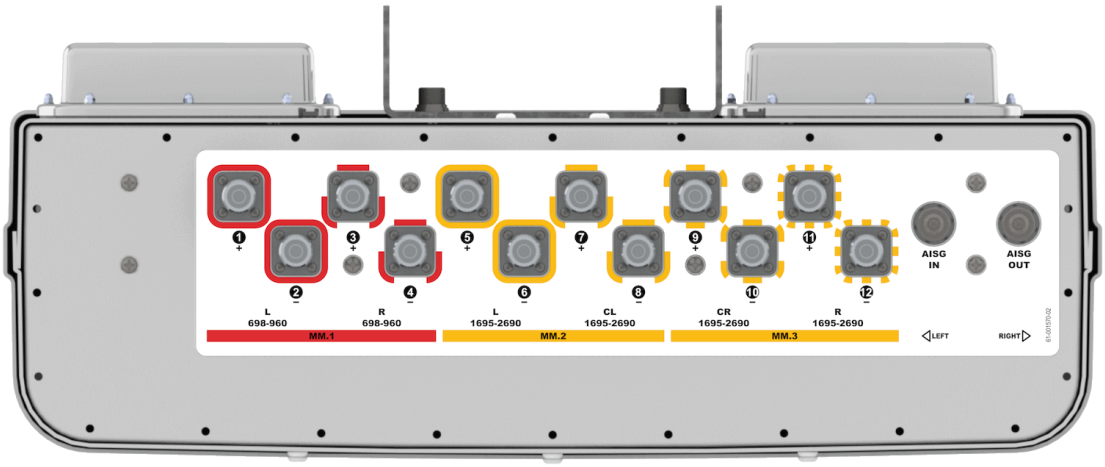
Mechanical

Dimensions (L×W×D)	71.6×25.0×7.8 in (1818×635×197 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load[1]	305 lbf @ 100 mph 1357 N @ 161 kph
Side Wind Load[1]	52 lbf @ 100 mph 232 N @ 161 kph
Effective Projective Area (EPA), Front[1]	12.1 ft^2 (1.1 m^2)
Weight *	90.5 lbs (41.1 kg)
RF Connector	12 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

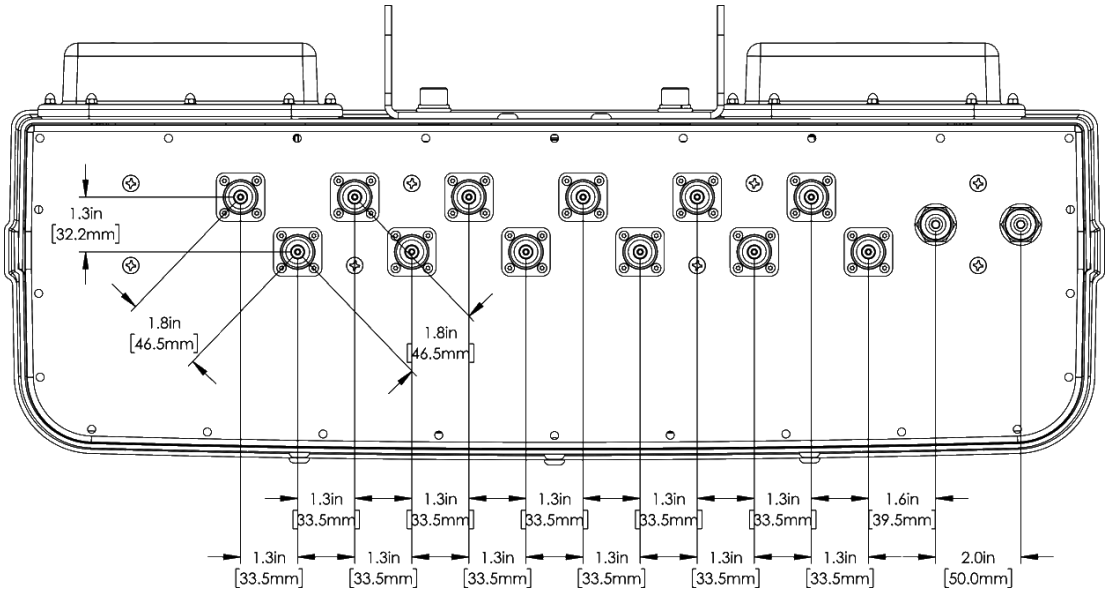
[1]Windload values calculated using CFD analysis
** Weight excludes mounting*

Mechanical

Bottom View



Connector Spacing



Mechanical

RET to Element Configuration

TPA65R-KE6GA Element and RET configuration (Type 17 Internal RET)

RET placement as viewed from rear of antenna

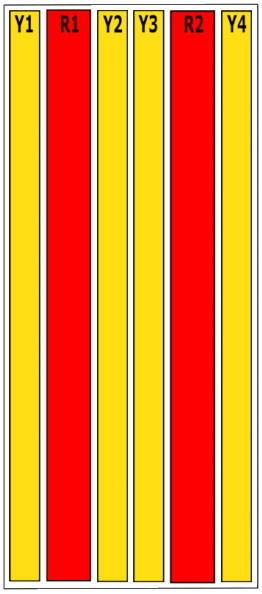
Top of antenna

MM.1

MM.2

MM.3

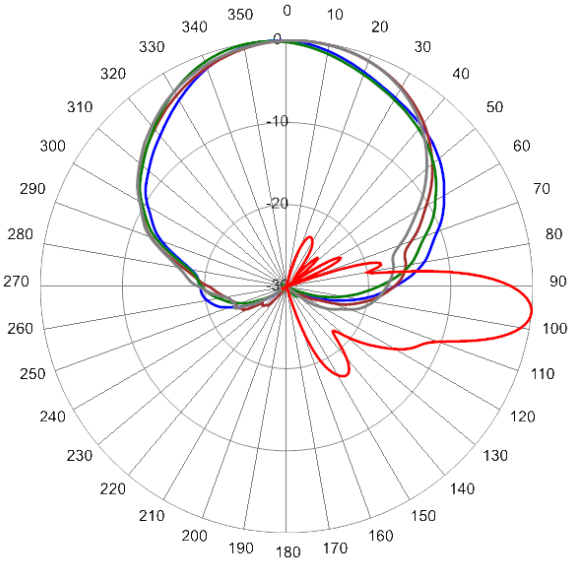
Top of antenna Viewed from rear



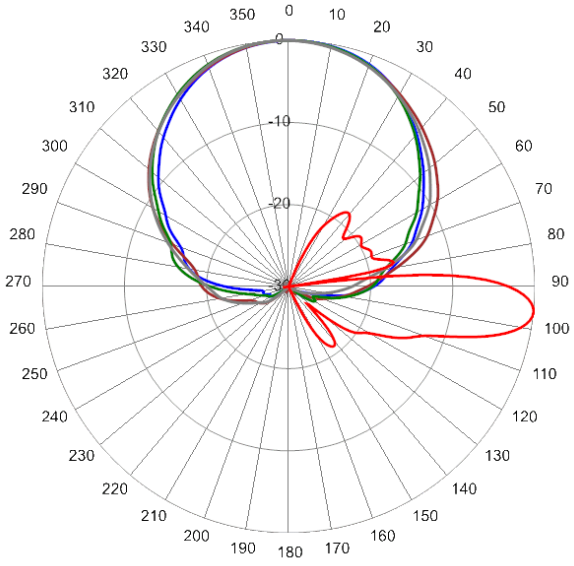
Array	Ports	Freq (MHz)	Ports controlled by common RET	AISG RET UID
R1	1, 2	698-960	1, 2, 3, 4	CIxxxxxxMM.1
R2	3, 4	698-960		
Y1	5, 6	1695-2690	5, 6, 7, 8	CIxxxxxxMM.2
Y2	7, 8	1695-2690		
Y3	9, 10	1695-2690	9, 10, 11, 12	CIxxxxxxMM.3
Y4	11, 12	1695-2690		

Typical Antenna Patterns

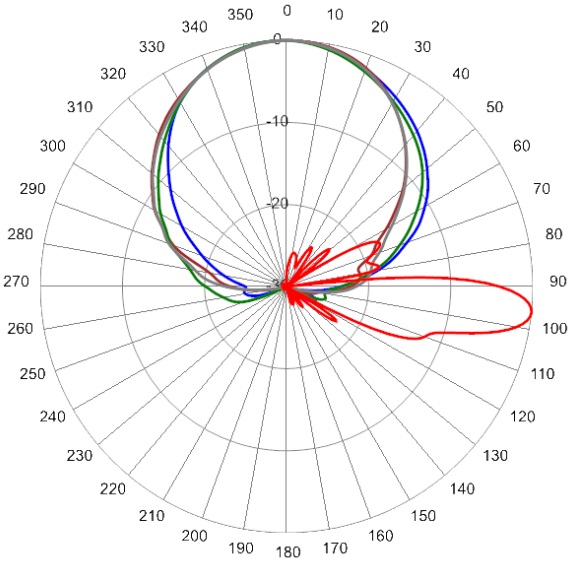
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com



734 MHz Azimuth with Elevation 6°

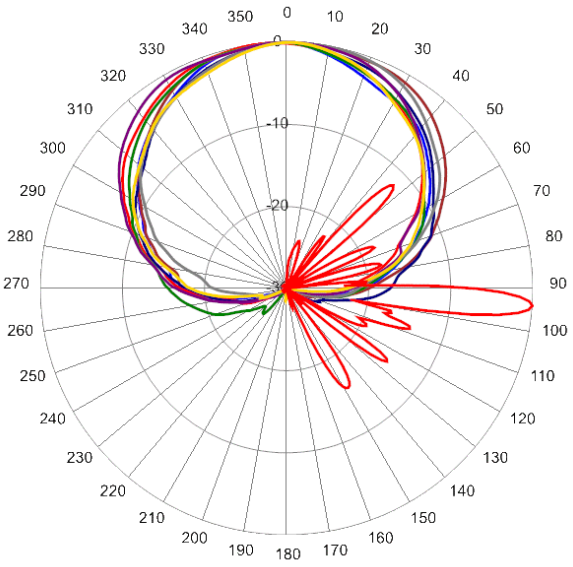


824 MHz Azimuth with Elevation 6°

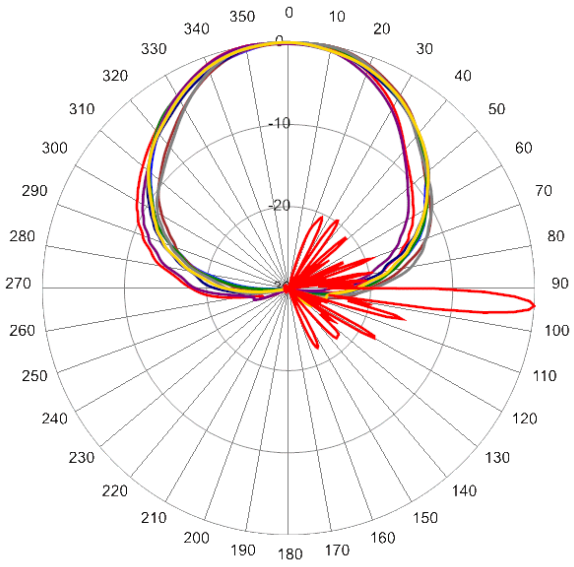


945 MHz Azimuth with Elevation 6°

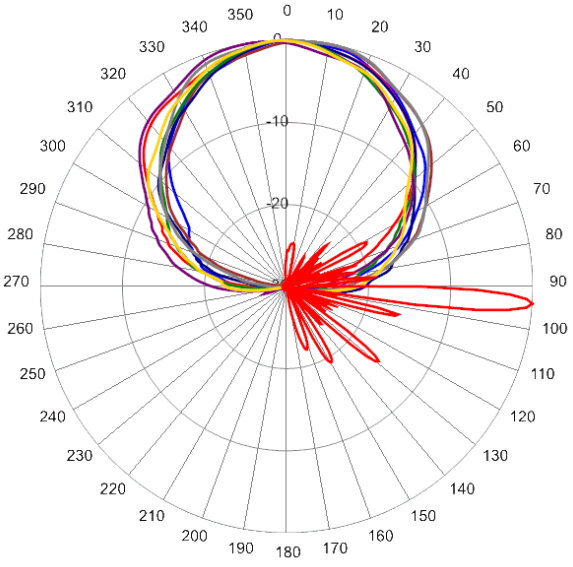
Typical Antenna Patterns



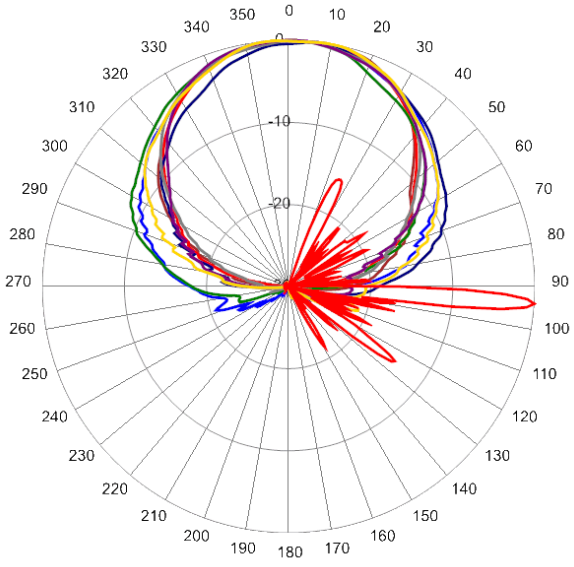
1720 MHz Azimuth with Elevation 4°



2110 MHz Azimuth with Elevation 4°



2360 MHz Azimuth with Elevation 4°



2650 MHz Azimuth with Elevation 4°

ORDERING

TriBand Twelve-Port Antenna

TPA65R-KE6G

Parts & Accessories

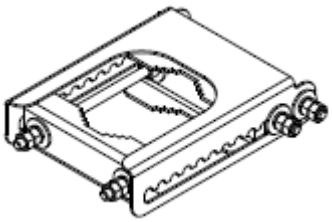
TPA65R-KE6GA-K	Six foot (1.8 m) TriBand antenna with 65° azimuth beamwidth, 4.3-10 female connectors, 3 factory installed BSA-RET400 RET actuators and MBK-01 mounting bracket
MBK-01	Mounting bracket kit (top and bottom) with 0° to 10° mechanical tilt adjustment
MBK-16	Mounting bracket kit (top and bottom) with fixed 0° mechanical tilt
BSA-RET400	Type 17 Internal Remote Electrical Tilt System (RET)
AISGC-M-F-10FT	Ten foot (3 m) Male/Female RRU to Antenna AISG cable

Mounting Bracket Kit

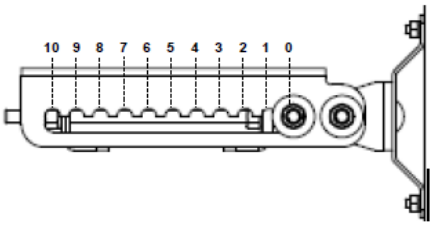
MBK-01

Mechanical

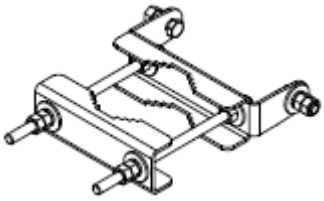
Weight	12.6 lbs (5.7 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lb (54 N·m)
Mechanical Tilt Adjustment	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



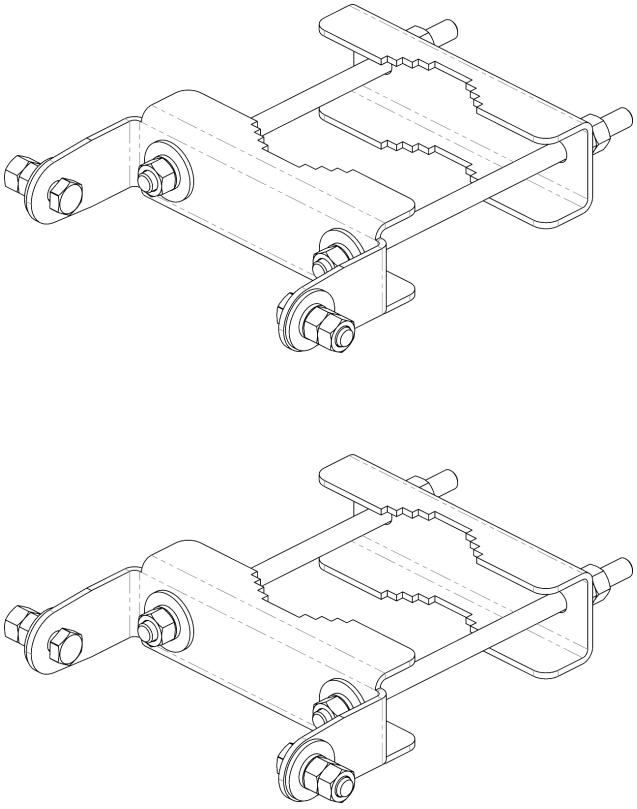
MBK-01 Bottom Fixed Bracket

Mounting Bracket Kit

MBK-16

Mechanical

Weight	9.9 lbs (4.5 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·lbs (54 N·m)
Mechanical Tilt	0°



MBK-16 Top and Bottom Bracket

Internal Remote Electrical Tilt (iRET)

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

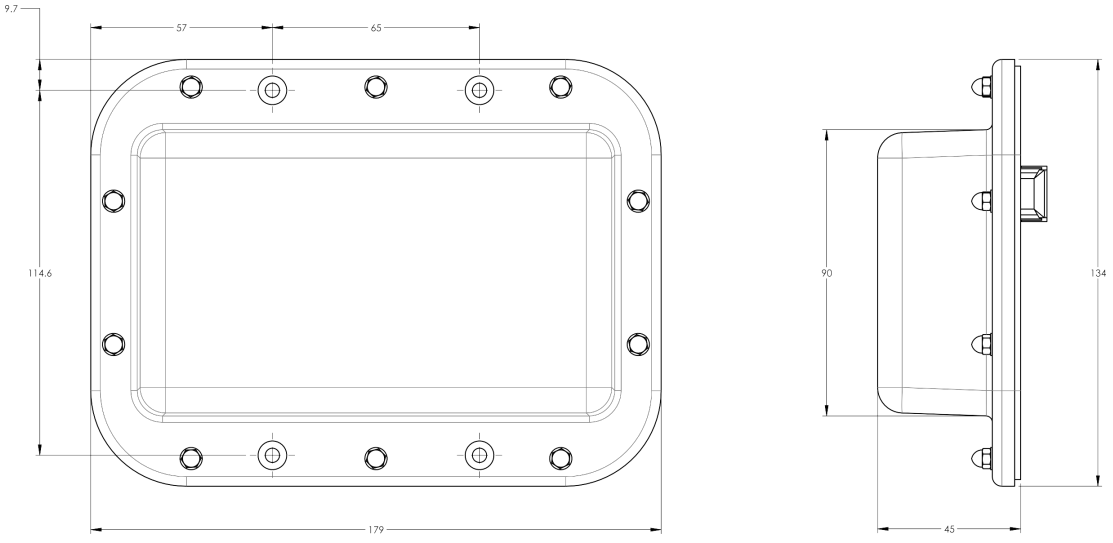
Data Interface Signal	DC
Input Voltage	10-30 Vdc
Current Consumption Tilt	100 mA at V_{in}=24 (500 mA MAX)
Current Consumption Idle	10 mA at V_{in}=24

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



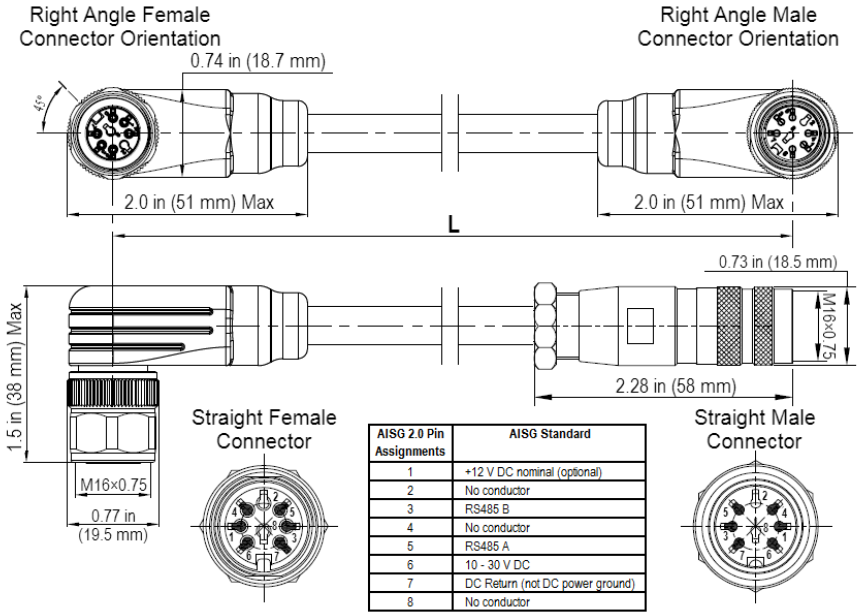
AISG Cable

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 ≈ 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 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-xFT
Temperature Range	-40° to 80° C
Flammability	UL 1581 VW-1
Ingress Protection	IEC 60529:2001, IP67

STANDARDS & CERTIFICATIONS

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