



Overview

- Six foot (1.8 m) Tri-Band, twelve port antenna with a 65° azimuth beamwidth covering 614-896 MHz and 1695-2690 MHz frequencies
- Eight wide high band ports covering 1695-2690 MHz and four wide low band ports covering 614-896 MHz in a single antenna enclosure
- Full Spectrum Compliance 614-896 MHz / 1695-2690 MHz
- Innovative Low and High Band Array configuration allows for 4T4R (4x4 MIMO) on Low Band and Dual 4T4R (4x4 MIMO) High Band Arrays, using full length arrays (non stacked)
- 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 new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Ordering options for External RET Controllers (Type 1) or Internally Integrated RET Controllers (Type 17)

The CCI 12-Port TriBand array is a twelve port antenna, with eight wide high band ports covering 1695-2690 MHz and four wide low band ports covering 614-896 MHz. The antenna provides the capability to deploy Dual 4x4 Multiple-Input Multiple-Output (MIMO) in the high band and 4X4 MIMO across low band ports. The CCI 12-Port high band ports have independent tilt control between left and right antenna arrays.

In this three RET configuration, the 1st RET is dedicated for the four Low Band ports. The 2nd RET is dedicated for the four Left High Band ports and the 3rd RET is dedicated for the four Right High Band ports. This RET arrangement allows for complete flexibility in coverage control between left and right high 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 High Band and 4X4 MIMO Low Band ports
- Ready for Network Standardization on 4.3-10 DIN 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



SPECIFICATIONS

Tri-Band Twelve-Port Antenna

TPA65R-TE6C

Electrical

Ports	4 x Low Band Ports for 614-896 MHz		
Frequency Range	614-698 MHz	698-806 MHz	824-896 MHz
Gain	14.7 dBi	15.0 dBi	14.9 dBi
Azimuth Beamwidth (-3dB)	71°	61°	56°
Elevation Beamwidth (-3dB)	14.6°	12.8°	11.3°
Electrical Downtilt	2° to 12°	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	<-17 dB	<-18 dB	<-19 dB
Front-to-Back Ratio @180°	> 30 dB	> 32 dB	> 35 dB
Cross-Polar Discrimination at Peak	> 25 dB	> 25 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 Linear 45°	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground

BASTA Electrical Specifications			
Frequency Range	614-698 MHz	698-806 MHz	824-896 MHz
Gain over all Tilts (dBi)	13.7	14.4	14.2
Gain over all Tilts Tolerance (dB)	0.7	0.5	0.6
Gain at Low-Tilt (dBi)	13.9	14.6	14.5
Gain at Mid-Tilt (dBi)	13.8	14.4	14.4
Gain at High-Tilt (dBi)	13.5	14.0	13.8
Azimuth Beamwidth Tolerance (°)	9.0	7.1	7.4
Elevation Beamwidth Tolerance (°)	1.2	1.0	0.7
Electrical Downtilt Deviation (°)	0.8	0.6	0.5
First Upper Sidelobe Suppression (dB)	14.7	15.0	15.1
Upper Sidelobe Suppression Peak to 20°(dB)	15.7	15.4	15.3
Front-to-Back Ratio over ±20° (dB)	24.3	26.9	28.1
Cross-polar Discrimination at ±60° (dB)	14.0	11.7	9.1

* Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6. All specifications are subject to change without notice.



Tri-Band Twelve-Port Antenna

TPA65R-TE6C

SPECIFICATIONS

Electrical

Ports	8 x High Band Ports for 1695-2690 MHz				
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Gain	18.2 dBi	18.4 dBi	18.7 dBi	18.5 dBi	18.1 dBi
Azimuth Beamwidth (-3dB)	61°	58°	57°	59°	59°
Elevation Beamwidth (-3dB)	5.6°	5.0°	4.7°	4.1°	3.9°
Electrical Downtilt	0° to 8°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	<-15 dB	<-16 dB	<-17 dB	<-19 dB	<-19 dB
Front-to-Back Ratio @180°	> 35 dB	> 35 dB	> 35 dB	> 35 dB	> 35 dB
Cross-Polar Discrimination at Peak	> 18 dB	> 17 dB	> 18 dB	> 21 dB	> 19 dB
Cross-Polar Port-to-Port Isolation	> 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
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)	17.2	17.6	17.7	17.4	17.1
Gain over all Tilts Tolerance (dB)	0.7	0.6	0.6	0.9	0.7
Gain at Low-Tilt (dBi)	17.1	17.2	17.4	17.0	16.9
Gain at Mid-Tilt (dBi)	17.3	17.8	18.0	17.6	17.3
Gain at High-Tilt (dBi)	17.3	17.8	17.8	17.6	17.1
Azimuth Beamwidth Tolerance (°)	3.5	3.7	5.2	6.0	4.8
Elevation Beamwidth Tolerance (°)	0.4	0.3	0.4	0.2	0.2
Electrical Downtilt Deviation (°)	0.5	0.5	0.4	0.5	0.5
First Upper Sidelobes Suppression (dB)	11.6	12.7	13.9	15.7	16.0
Upper Sidelobe Suppression Peak to 20°(dB)	11.9	12.9	12.6	12.1	12.7
Front-to-Back Ratio over ±20° (dB)	28.1	27.9	26.4	26.3	25.5
Cross-polar Discrimination at ±60° (dB)	6.7	5.0	4.8	4.2	6.7

* Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6. All specifications are subject to change without notice.

Mechanical

Dimensions (LxWxD)	71.2x25.5x8.1 in (1808x648x205 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	392 lbs (1742 N) @ 100 mph (161 kph)
Side Wind Load	149 lbs (664 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	15.3 ft² (1.4 m²)
Weight *	86.6 lbs (39.3 kg)
Connector	12 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

* Weight excludes mounting



SPECIFICATIONS

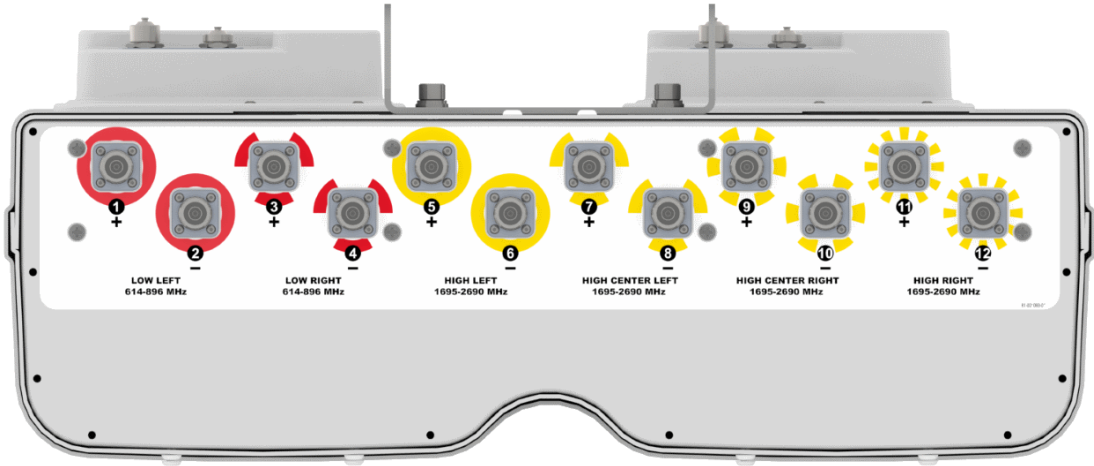
Tri-Band Twelve-Port Antenna

TPA65R-TE6C

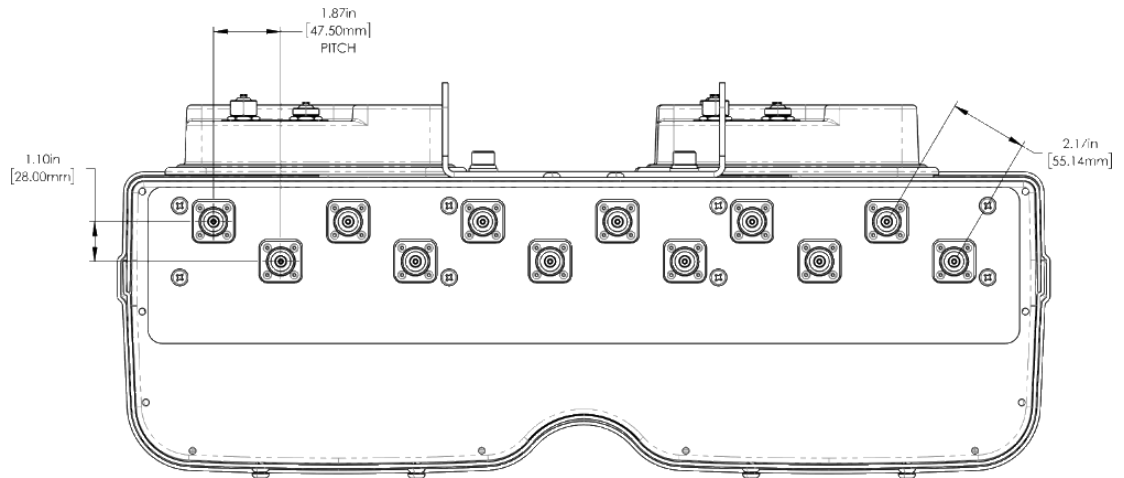
Mechanical

Bottom View

TPA65R-TE6CA (Type 1 External RET)



Connector Spacing



SPECIFICATIONS

Tri-Band Twelve-Port Antenna

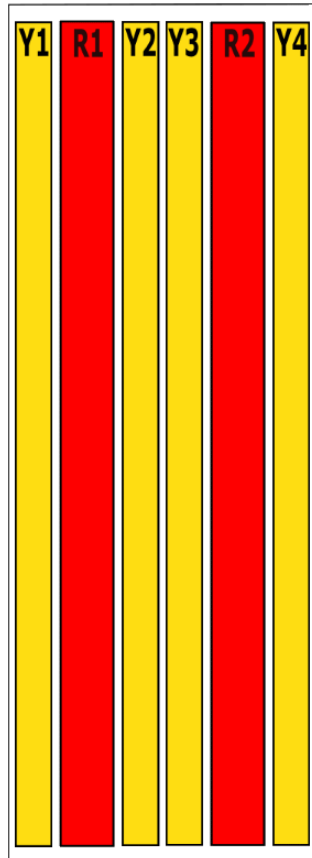
TPA65R-TE6C

Mechanical

RET to Element Configuration

TPA65R-TE6CA Element and RET configuration (Type 1 External RET)

**Top of antenna
Viewed from rear**



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

Top of antenna



614-896
Ports 1, 2, 3 & 4
(R1 & R2)



1695-2690
Ports 5, 6, 7 & 8
(Y1 & Y2)



1695-2690
Ports 9, 10, 11 & 12
(Y3 & Y4)

Array	Ports	Freq (MHz)	Ports controlled by common RET
R1	1, 2	614-896	1, 2, 3, 4
R2	3, 4	614-896	
Y1	5, 6	1695-2690	5, 6, 7, 8
Y2	7, 8	1695-2690	
Y3	9,10	1695-2690	9, 10, 11, 12
Y4	11,12	1695-2690	



SPECIFICATIONS

Tri-Band Twelve-Port Antenna

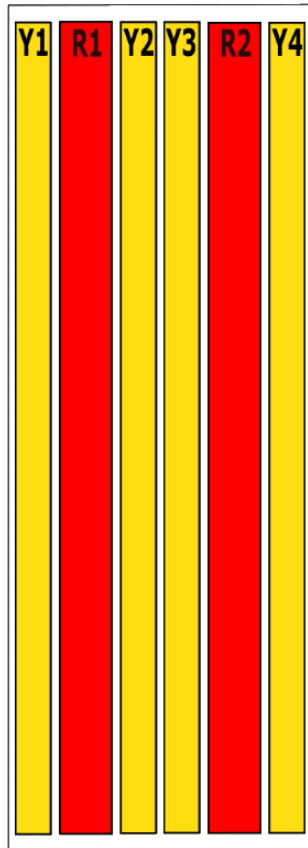
TPA65R-TE6C

Mechanical

RET to Element Configuration

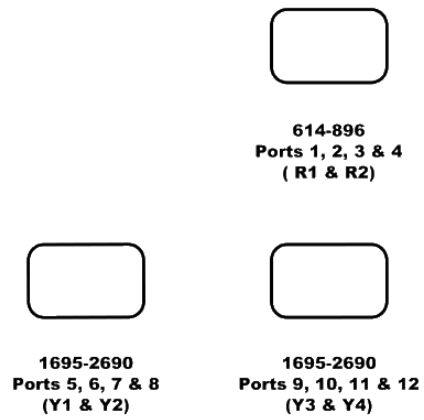
TPA65R-TE6CB Element and RET configuration (Type 17 Internal RET)

**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	614-896	1, 2, 3, 4	Cxxxxxxxxxmm.1
R2	3, 4	614-896		
Y1	5, 6	1695-2690	5, 6, 7, 8	Cxxxxxxxxxmm.2
Y2	7, 8	1695-2690		
Y3	9,10	1695-2690	9, 10, 11, 12	Cxxxxxxxxxmm.3
Y4	11,12	1695-2690		

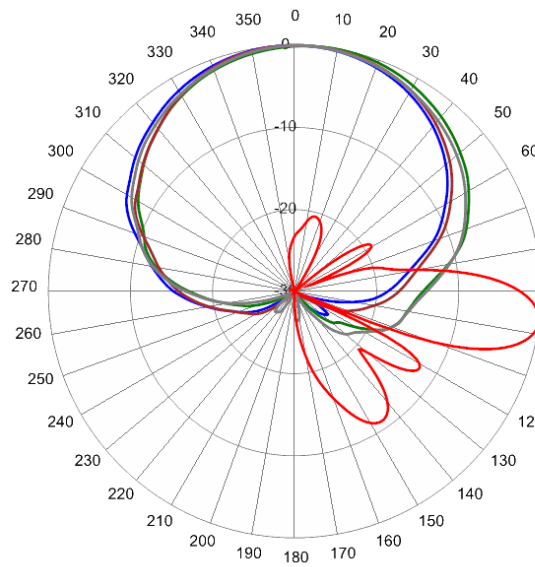


Tri-Band Twelve-Port Antenna

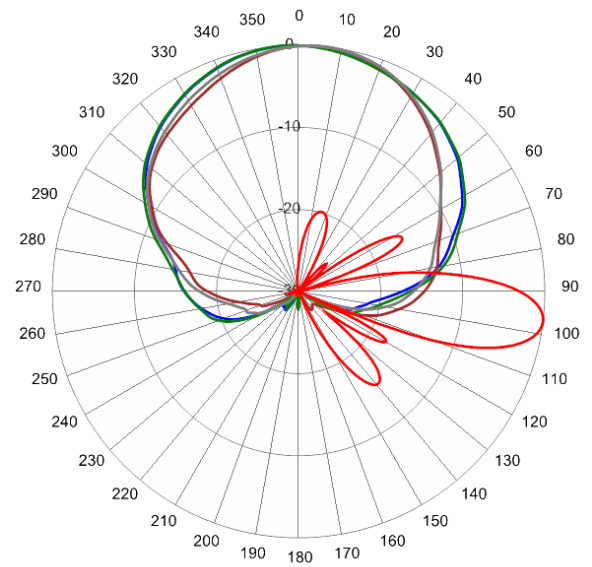
TPA65R-TE6C

Typical Antenna Patterns

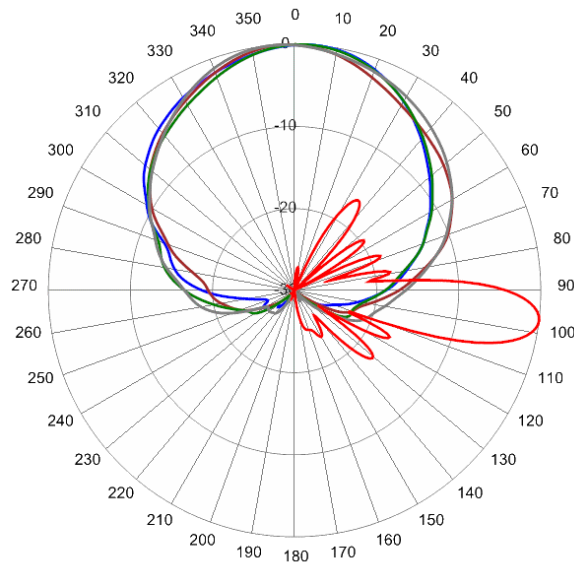
For detailed information on additional antenna patterns, contact customer support at support@cciproducts.com



614 MHz Azimuth with Elevation 7°



698 MHz Azimuth with Elevation 7°



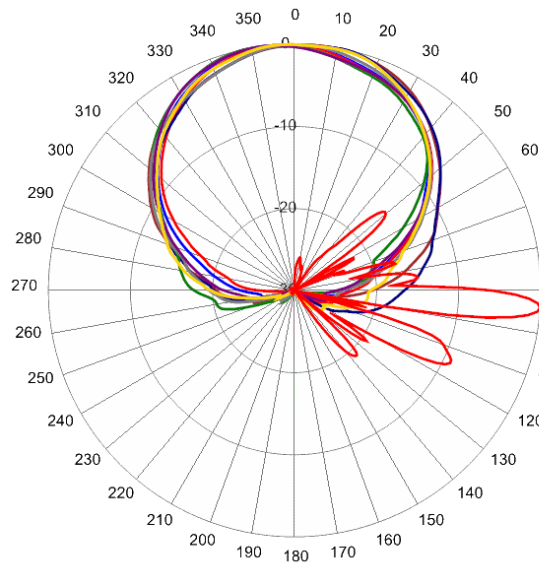
824 MHz Azimuth with Elevation 7°



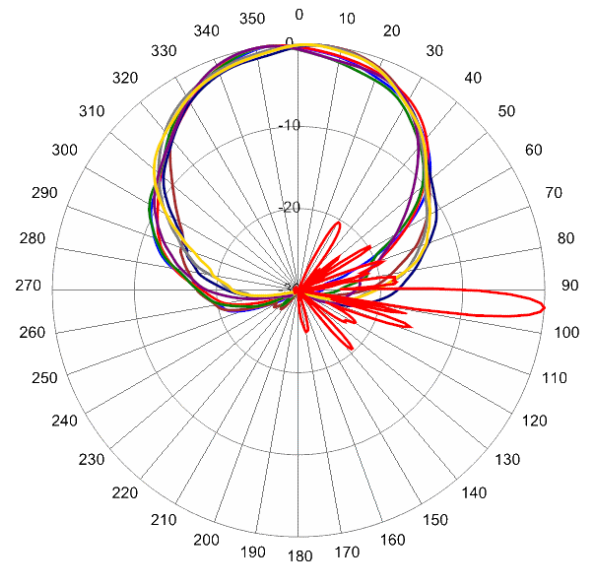
Tri-Band Twelve-Port Antenna

TPA65R-TE6C

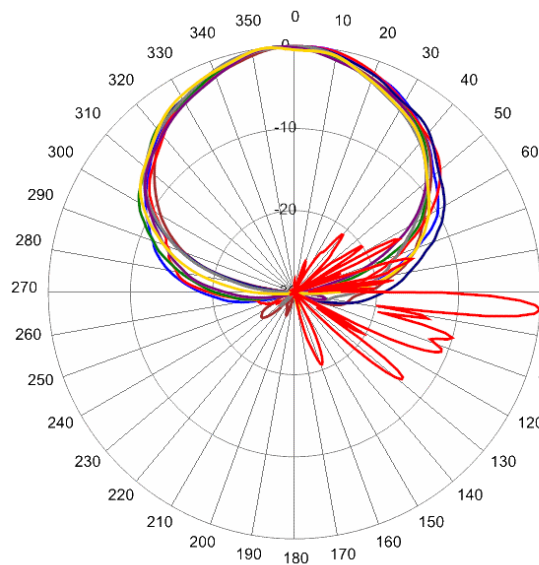
Typical Antenna Patterns



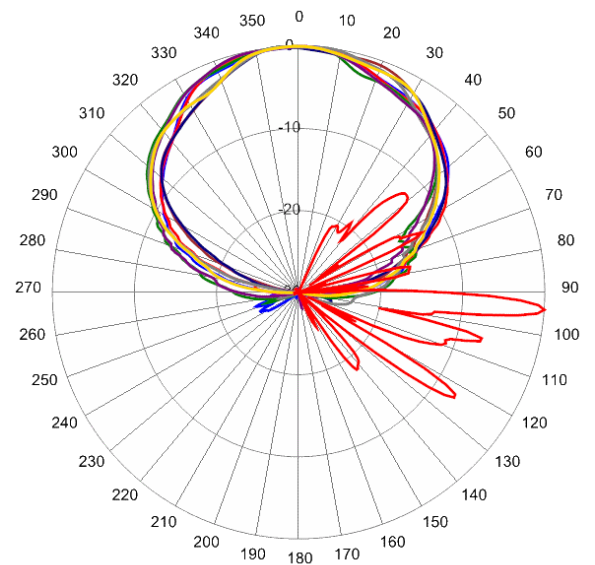
1740 MHz Azimuth with Elevation 4°



1920 MHz Azimuth with Elevation 4°



2155 MHz Azimuth with Elevation 4°



2500 MHz Azimuth with Elevation 4°



Parts & Accessories

TPA65R-TE6CA-K	Six foot (1.8 m) TriBand antenna with 65° azimuth beamwidth, 4.3-10 female connectors, 3 factory installed BSA-RET200 RET actuators (Type 1 External) and 0° - 10° mechanical tilt mounting bracket (MBK-01)
TPA65R-TE6CB-K	Six foot (1.8 m) TriBand antenna with 65° azimuth beamwidth, 4.3-10 female connectors, 3 factory installed BSA-RET400 RET actuators (Type 17 Internal) and 0° - 10° mechanical tilt mounting bracket (MBK-01)
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-RET200	Remote electrical tilt actuator Type 1 External
BSA-RET400	Remote electrical tilt actuator Type 17 Internal
DPA-CBK-AG-RRU	RRU AISG cable kit for three RET antenna
DPA-CBK-RA-AG-RRU	RRU AISG right angle cable kit for three RET antenna

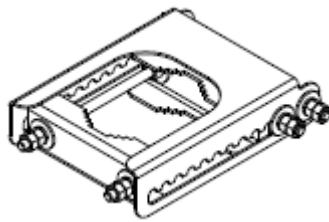


Mounting Bracket Kit

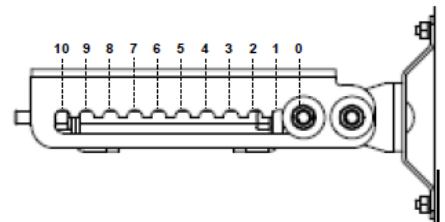
MBK-01

Mechanical

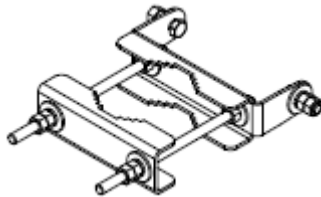
Weight	12.6 lbs (5.7 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lb (54 N·m)
Mechanical Tilt Adjustment	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed Bracket

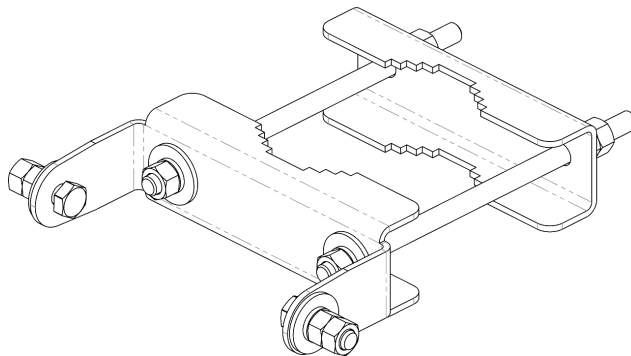
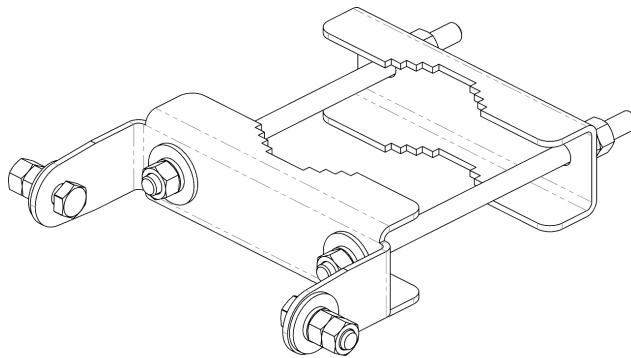


Mounting Bracket Kit

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



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

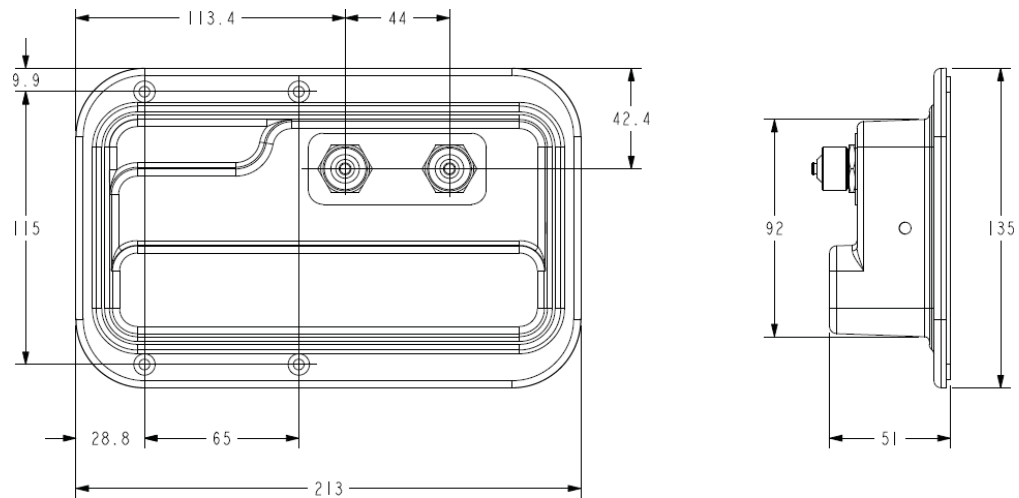
Electrical

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





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

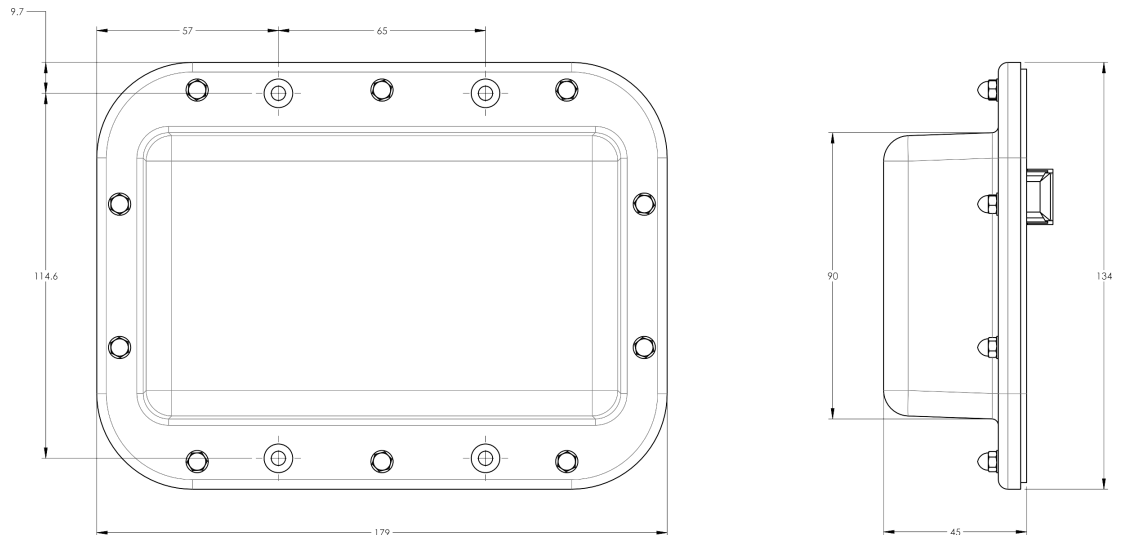
Electrical

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



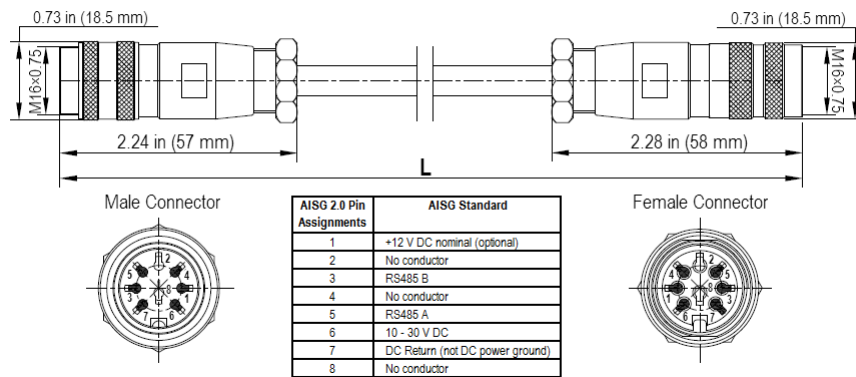


AISG Cable Kit

Electrical/Mechanical/Environmental Specifications

	RET to RET Cables	RRU to Antenna Cables
Individual Cable Part Number	AISGC-M-F-27	AISGC-M-F-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 Straight male/straight female	
Length	27 in (686 mm)	120 in (3048 mm)
Weight	0.33 lbs (0.15 kg)	0.69 lbs (0.31 kg)
Cables per kit	2	2

Mechanical Specifications

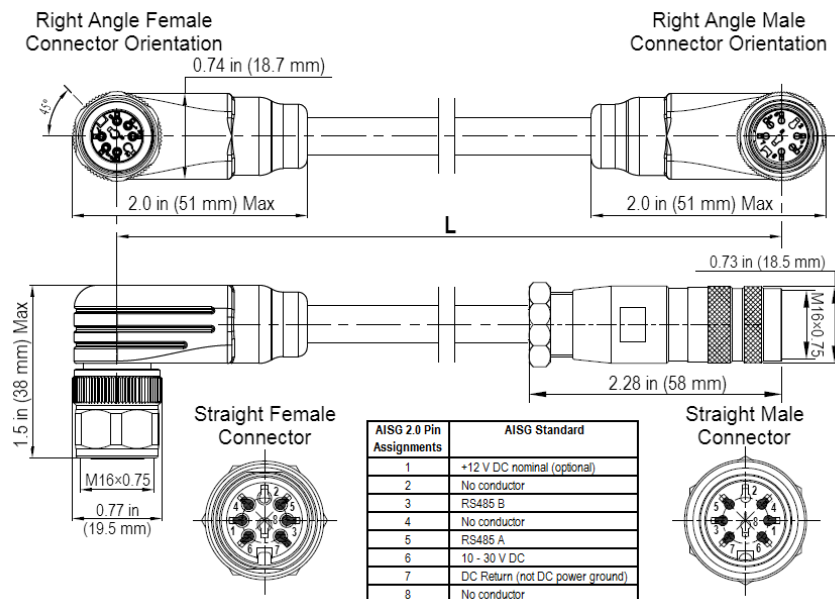


AISG-Male to AISG-Female Jumper Cable

Electrical/Mechanical/Environmental Specifications

	RET to RET Cables	RRU to Antenna Cables
Individual Cable Part Number	AISGC-MRA-FRA-36	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	36 in (914 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



STANDARDS & CERTIFICATIONS

Tri-Band Twelve-Port Antenna

TPA65R-TE6C

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

