



## DATA SHEET

## TriBand Twelve-Port Antenna

TPA65R-GE6A



- Six foot (1.8 m) TriBand, twelve port antenna with a 65° azimuth beamwidth covering 614-806 MHz and 1695-2690 MHz frequencies
- Eight wide high band ports covering 1695-2690 MHz and four wide low band ports covering 614-806 MHz in a single antenna enclosure
- Full Spectrum Compliance 614-806 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), all in a single enclosure
- 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
- Equipped with 4 field replaceable, integrated AISG 2.0 compliant Remote Electrical Tilt (RET) Controllers (Type 1 External)

## Overview

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 614-806 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 allows independent tilt control between the low band ports and high band ports and independent tilt control between left and right antenna arrays.

In this four RET configuration, the 1st RET is dedicated for the two Left Low Band ports and the 3rd RET is for the two Right Low Band ports. The 2nd RET is dedicated for the four Left High Band ports and the 4th RET is dedicated for the four Right High Band ports. This RET arrangement allows for complete flexibility in coverage control between left and right 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

### TriBand Twelve-Port Antenna

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#### Electrical

Ports	4 × Low Band Ports for 614-806 MHz	
Frequency Range	614-698 MHz	698-806 MHz
Gain	14.6 dBi	14.9 dBi
Azimuth Beamwidth (-3dB)	71°	63°
Elevation Beamwidth (-3dB)	14.4°	12.9°
Electrical Downtilt	2° to 12°	2° to 12°
Elevation Sidelobes (1st Upper)	<-17 dB	<-18 dB
Front-to-Back Ratio @180°	> 28 dB	> 32 dB
Cross-Polar Discrimination at Peak	> 23 dB	> 23 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts
Polarization	Dual Linear 45°	Dual Linear 45°
Input Impedance	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground

BASTA Electrical Specifications		
Frequency Range	614-698 MHz	698-806 MHz
Gain over all Tilts (dBi)	13.7	14.0
Gain over all Tilts Tolerance (dB)	0.6	0.6
Gain at Low-Tilt (dBi)	13.8	14.3
Gain at Mid-Tilt (dBi)	13.7	14.1
Gain at High-Tilt (dBi)	13.5	13.7
Azimuth Beamwidth Tolerance (°)	7.8	7.4
Elevation Beamwidth Tolerance (°)	1.1	1.1
Electrical Downtilt Deviation (°)	0.8	0.8
First Upper Sidelobe Suppression (dB)	13.5	14.7
Upper Sidelobe Suppression Peak to 20°(dB)	16.3	16.5
Front-to-Back Ratio over ±20° (dB)	21.2	24.6
Cross-polar Discrimination at ±60° (dB)	7.2	10.0

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



## SPECIFICATIONS

## TriBand Twelve-Port Antenna

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## 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	17.9 dBi	18.2 dBi	18.5 dBi	18.3 dBi	18.1 dBi
Azimuth Beamwidth (-3dB)	62°	62°	61°	69°	64°
Elevation Beamwidth (-3dB)	5.7°	5.2°	4.8°	4.1°	3.7°
Electrical Downtilt	0° to 8°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -16 dB	< -18 dB	< -17 dB	< -17 dB	< -18 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	> 22 dB	> 20 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)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 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	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Frequency Range	1695-1880 MHz	1850-1990 MHz	1920-2180 MHz	2300-2400 MHz	2496-2690 MHz
Gain over all Tilts (dBi)	16.9	17.1	17.6	17.1	17.0
Gain over all Tilts Tolerance (dB)	0.6	0.9	0.8	0.9	0.9
Gain at Low-Tilt (dBi)	16.6	16.7	17.1	16.5	16.7
Gain at Mid-Tilt (dBi)	16.9	17.3	17.8	17.4	17.2
Gain at High-Tilt (dBi)	17.1	17.4	17.7	17.6	17.0
Azimuth Beamwidth Tolerance (°)	5.3	3.3	3.2	6.0	7.5
Elevation Beamwidth Tolerance (°)	0.5	0.3	0.5	0.3	0.3
Electrical Downtilt Deviation (°)	0.6	0.6	0.5	0.6	0.6
First Upper Sidelobes Suppression (dB)	13.0	13.9	14.3	15.0	15.2
Upper Sidelobe Suppression Peak to 20°(dB)	12.4	13.1	12.7	12.8	12.6
Front-to-Back Ratio over ±20° (dB)	28.5	29.2	27.8	27.7	27.4
Cross-polar Discrimination at ±60° (dB)	9.5	7.2	7.2	6.1	8.5

\* Electrical specifications follow document "Recommendation on Base Station Antenna Standards" (BASTA) V9.6.  
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## Mechanical

Dimensions (LxWxD)	71.1x25.5x7.6 in (1807x648x194 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	391 lbs (1741 N) @ 100 mph (161 kph)
Side Wind Load	143 lbs (635 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	15.3 ft <sup>2</sup> (1.4 m <sup>2</sup> )
Weight *	79.6 lbs (36.1 kg)
RET Weight	6.6 lbs (3.0 kg)
Connector	12 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

\* Weight excludes mounting and RET



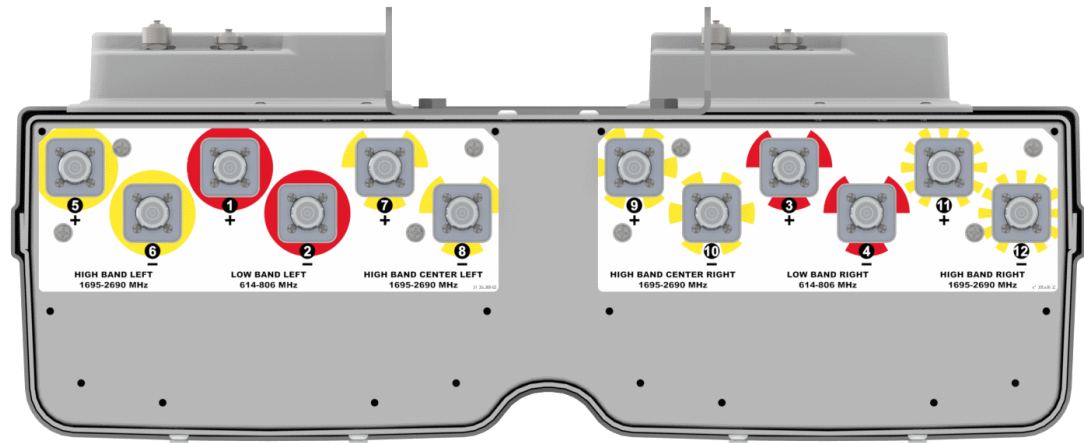
## SPECIFICATIONS

### TriBand Twelve-Port Antenna

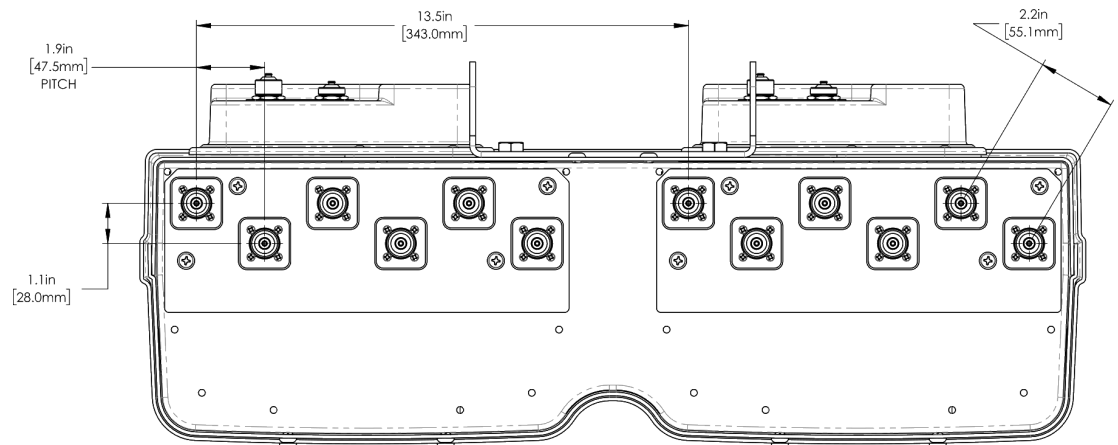
TPA65R-GE6A

#### Mechanical

Bottom View



#### Connector Spacing



## SPECIFICATIONS

### TriBand Twelve-Port Antenna

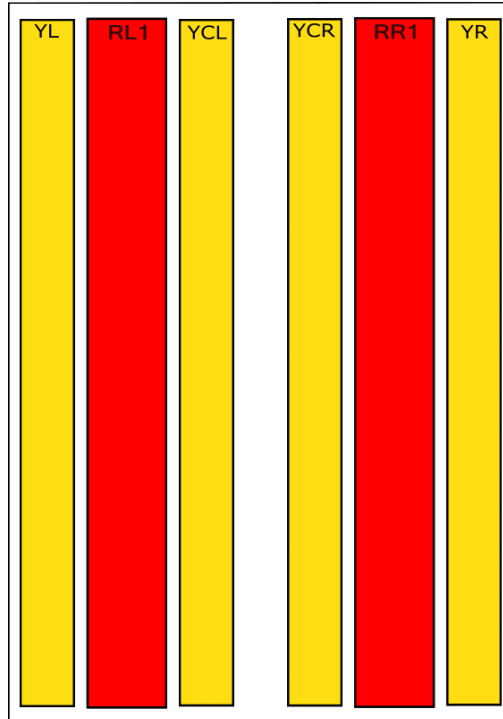
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#### Mechanical

RET to Element Configuration

TPA65R-GE6AA Element and RET configuration (Type 1 External RET)

#### Top of antenna Viewed from rear



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

##### Top of antenna



614-806  
Ports 1 & 2  
(RL1)



614-806  
Ports 3 & 4  
(RR1)



1695-2690  
Ports 5, 6, 7 & 8  
(YL & YCL)



1695-2690  
Ports 9, 10, 11 & 12  
(YCR & YR)

Array	Ports	Freq (MHz)	Ports controlled by common RET
RL1	1, 2	614-806	1, 2
RR1	3, 4	614-806	3, 4
YL	5, 6	1695-2690	5, 6, 7, 8
YCL	7, 8	1695-2690	
YCR	9,10	1695-2690	9, 10, 11,12
YR	11,12	1695-2690	



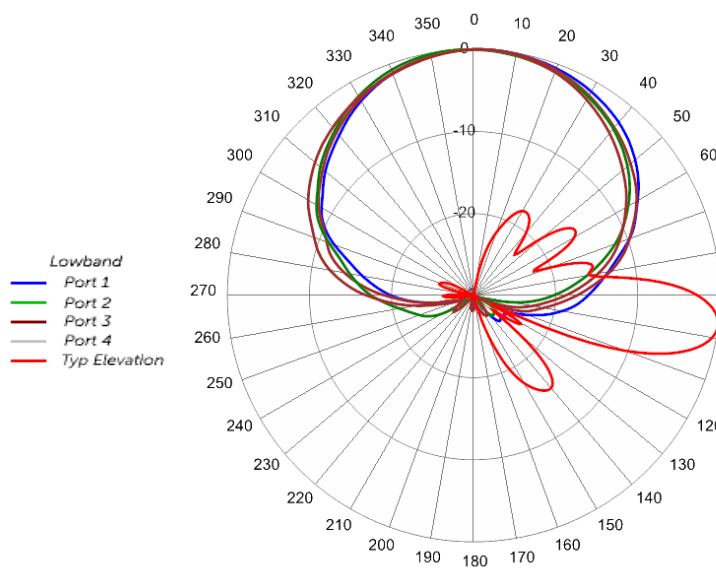
SPECIFICATIONS

TriBand Twelve-Port Antenna

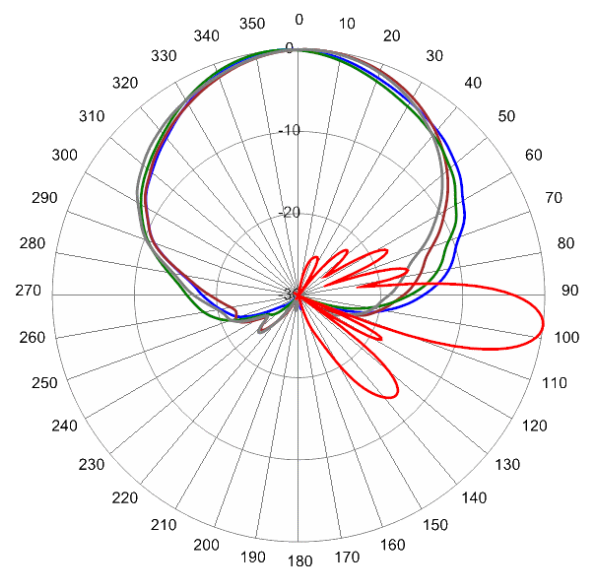
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Typical Antenna Patterns

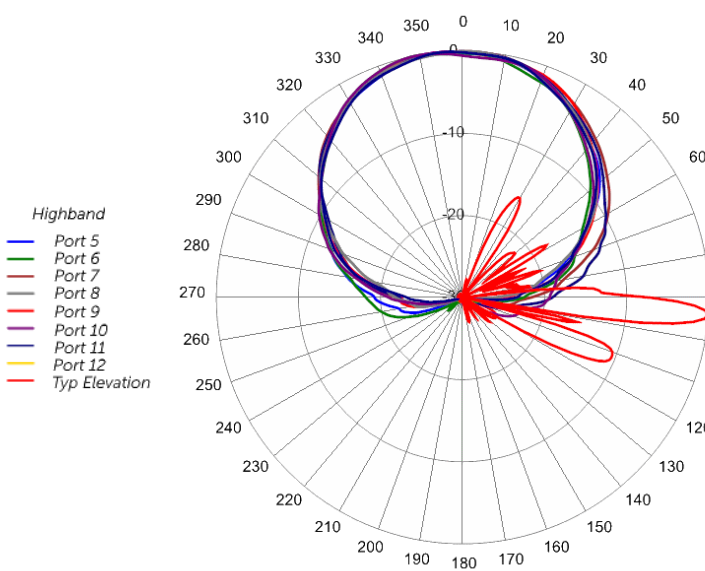
For detailed information on additional antenna patterns, contact customer support at [support@cciprducts.com](mailto:support@cciprducts.com)



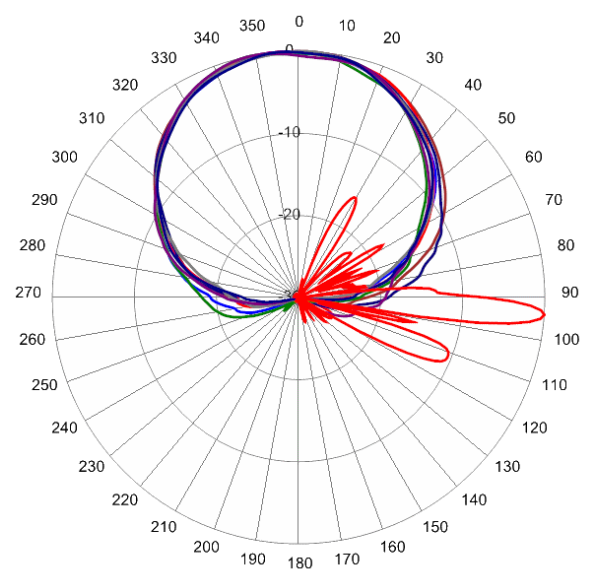
617 MHz Azimuth with Elevation 7°



734 MHz Azimuth with Elevation 7°



1720 MHz Azimuth with Elevation 4°



1920 MHz Azimuth with Elevation 4°

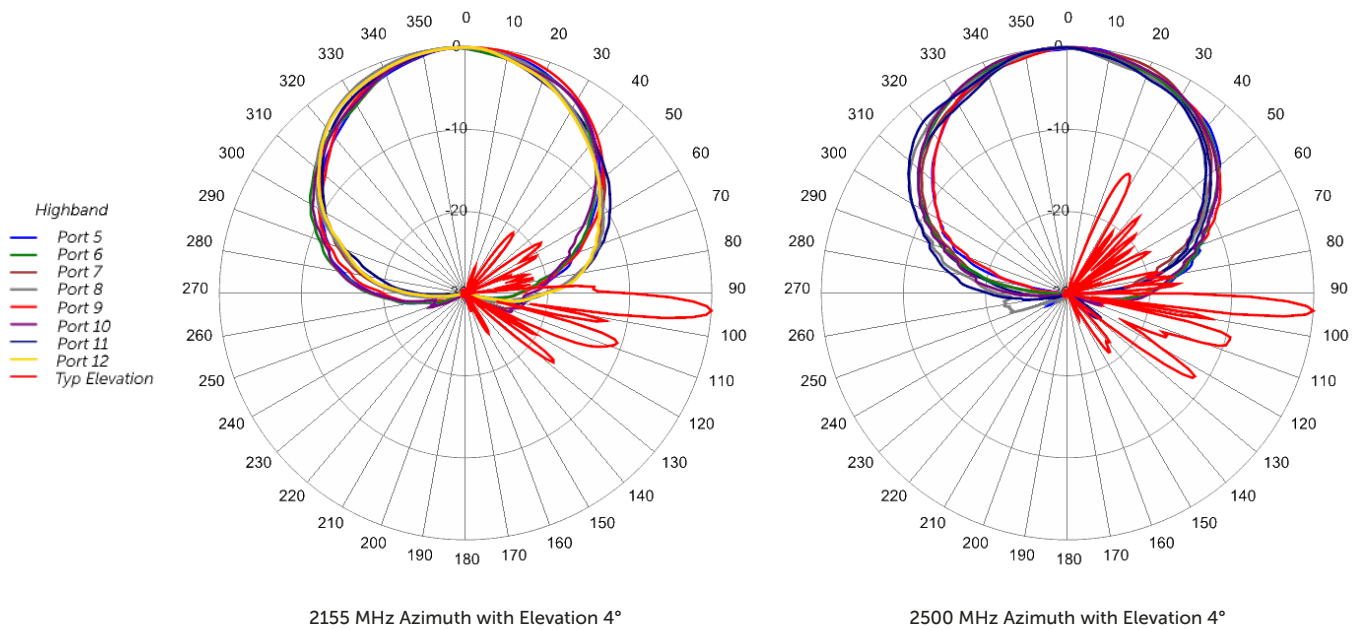


SPECIFICATIONS

TriBand Twelve-Port Antenna

TPA65R-GE6A

Typical Antenna Patterns





ORDERING

TriBand Twelve-Port Antenna

TPA65R-GE6A

Parts & Accessories

TPA65R-GE6AA-K	Six foot (1.8 m) TriBand antenna with 65° azimuth beamwidth, 4.3-10 female connectors, 4 factory installed BSA-RET200 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
KUE-CBK-AG-RRU	RRU AISG cable kit for four RET antenna
KUE-CBK-RA-AG-RRU	RRU AISG right angle cable kit for four RET antenna





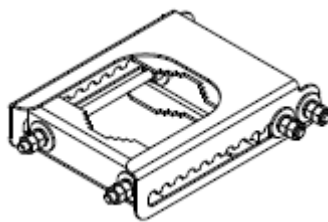
ACCESSORIES

Mounting Bracket Kit

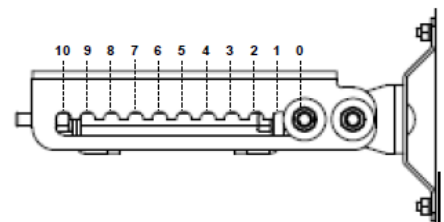
MBK-01

Mechanical

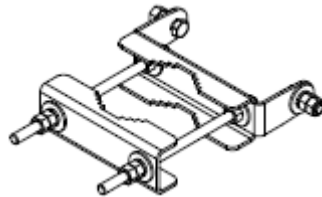
Weight	12.6 lbs (5.7 kg)
Hinge Pitch	47.25 in (1200 mm)
Mounting Pole Dimension	2 to 5 in (5 to 12 cm)
Fastener Size	M12
Installation Torque	40 ft·lb (54 N·m)
Mechanical Tilt Adjustment	0° - 10°



MBK-01 Top Adjustable Bracket



MBK-01 Top Adjustable Bracket Side View



MBK-01 Bottom Fixed 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	$\pm 0.1^\circ$
Temperature Range	-40° C to 70° C

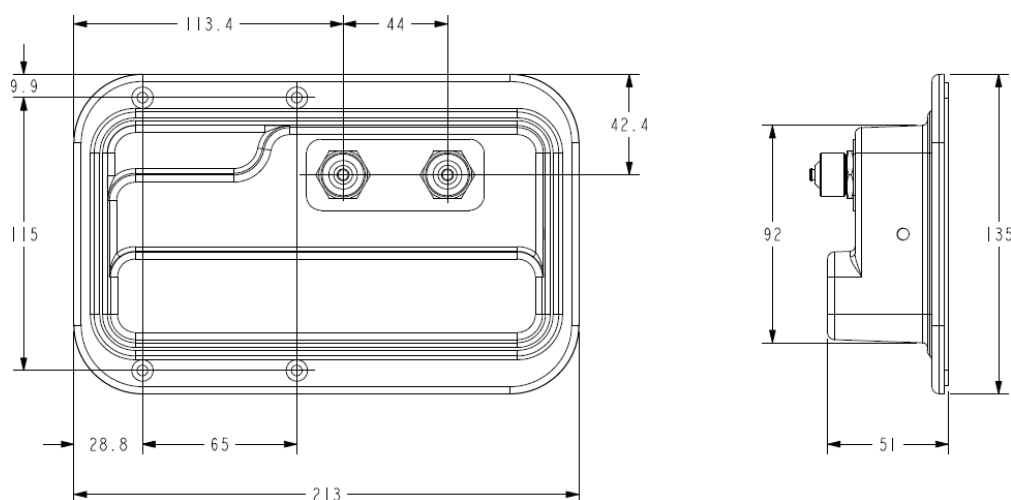
### Electrical

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





ACCESSORIES

AISG Cable Kit

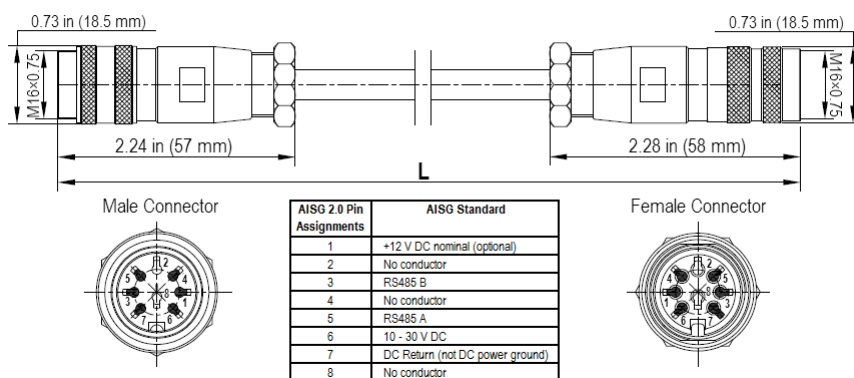
KUE-CBK-AG-RRU

Electrical Specifications

Individual Cable Part Number	AISGC-M-F-34	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-34	AISGC-M-F-10FT
Cables per kit	3	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 N-m)	Hand tighten only $\approx 1.84$ ft-lbs (2.5 N-m)
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	34 in (864 mm)	120 in (3048 mm)
Weight	0.33 lbs (0.15 kg)	0.69 lbs (.31 kg)
Minimum bend radius	3.9 in (100 mm)	3.9 in (100 mm)



AISG-Male to AISG-Female Jumper Cable

Environmental Specifications

Individual Cable Part Number	AISGC-M-F-34	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



ACCESSORIES

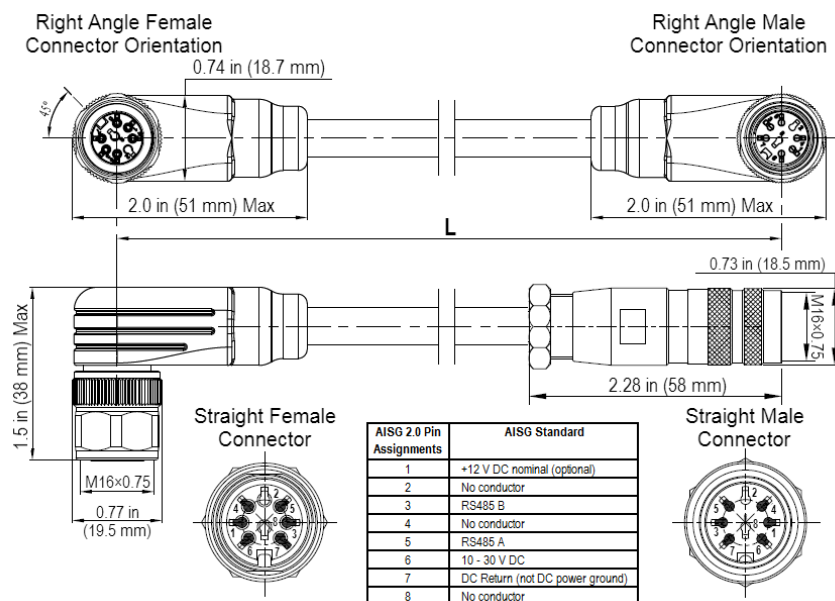
AISG Cable Kit

KUE-CBK-RA-AG-RRU

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 $\approx$ 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	36 in (914 mm)	120 in (3048 mm)
Weight	0.23 lbs (0.10 kg)	0.77 lbs (0.35 kg)
Cables per kit	3	2

Mechanical Specifications



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



## STANDARDS & CERTIFICATIONS

### TriBand Twelve-Port Antenna

TPA65R-GE6A

#### 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

