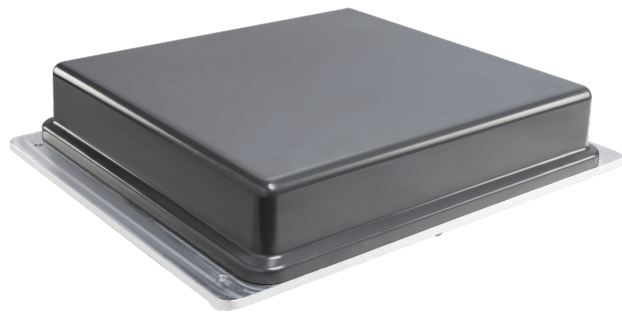


SENCITY® Rail MIMO+ 4x4 Antenna with GNSS

1399.99.0303

Properties

- 5-Port Railway rooftop antenna for cellular bands
- Enables 4x4 MIMO with true polarisation diversity for high data throughput
- Average combined condition number on the supported cellular bands of <10dB on the primary antennas
- Supporting 2G/3G/4G/5G bands between 694-4200 MHz
- Rugged design, meets EN 50155 Railway Standard
- High Voltage and High Current protection for use under catenary lines
- Fire retardant acc. to EN 45545-2 and NFPA130
- Embedded Dual-Band GNSS antenna with integrated LNA

**Electrical data**

	Band 1	Band 2	Band 3	Band 4
Name	Vertical polarisation	Vertical polarisation	Vertical polarisation	Horizontal Polarisation
Frequency	617 MHz ... 960 MHz	1425 MHz ... 2690 MHz	3300 MHz ... 4200 MHz	694 MHz ... 960 MHz
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
VSWR	2	2.1	2.1	1.8
Gain	7 dBi	8 dBi	9 dBi	7 dBi
Isolation between Ports	30 dB	28 dB	35 dB	30 dB
Ambient Temperature	25 °C	25 °C	25 °C	25 °C
Composite Power max	80 W	80 W	80 W	80 W

	Band 5	Band 6	Band 7	Band 8
Name	Horizontal Polarisation	Horizontal Polarisation	GNSS 1	GNSS 2
Frequency	1515 MHz ... 2690 MHz	3300 MHz ... 4200 MHz	1164 MHz ... 1279 MHz	1555 MHz ... 1610 MHz

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	Band 5	Band 6	Band 7	Band 8
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
VSWR	1.9	2.2	1.5	1.5
Gain	9 dBi	9 dBi		
Isolation between Ports	28 dB	35 dB		
Ambient Temperature	25 °C	25 °C	25 °C	25 °C
Composite Power max	80 W	80 W		

Electrical remarks

Remarks	Ground plane: VSWR and gain values are based on a reference ground plane of 1000x500mm. The tolerance of the VSWR and Isolation values is 0.5dB. The Cellular and Wi-Fi 6E bands from 4900 - 7125 MHz are supported on the vertically polarized ports (no ground plane requirements). The isolation values are valid only for the ports with common bands. The best indicator for the actual antenna performance is the average combined condition number. The isolation values mentioned on page 1 refers to the isolation between Port 1 (vertical) and Port 2 (horizontal). The Isolation limit values between the other ports are below: Port 3 (vertical) to Port 4 (vertical): Frequency 617-960 MHz, Isolation: 16dB Frequency 1425-2700 MHz, Isolation: 22dB Frequency 3300-7125 MHz, Isolation: 25dB Port 3 (vertical) to Port 2 (horizontal): Frequency 694-960 MHz, Isolation: 23dB Frequency 1515-2700 MHz, Isolation: 30dB Frequency 3300-4200 MHz, Isolation: 35dB Port 4 (vertical) to Port 2 (horizontal): Frequency 694-960 MHz, Isolation: 21dB Frequency 1515-2700 MHz, Isolation: 29dB Frequency 3300-4200 MHz, Isolation: 33dB Port 1 (vertical) to Port 3 (vertical): Frequency 617-960 MHz, Isolation: 26dB Frequency 1425-2700 MHz, Isolation: 27dB Frequency 3300-7125 MHz, Isolation: 30dB Port 1 (vertical) to Port 4 (vertical): Frequency 617-960 MHz, Isolation: 26dB Frequency 1425-2700 MHz, Isolation: 27dB Frequency 3300-7125 MHz, Isolation: 30dB High-voltage-protection: no voltage on RF port, if the catenary line touches the antenna (EN 50124-1, 3.8 kVDC, 27.5 kVAC, 1min). High-current-protection: Designed acc. to UIC 533, DC-grounded antenna element (protection against lightning and short circuit with catenary lines(40kA/0.125s)
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Ports				
	Port 1	Port 2	Port 3	Port 4
Port name	Cellular 1	Cellular 2	Cellular 3	Cellular 4
Connector	N, jack (female)	N, jack (female)	N, jack (female)	N, jack (female)
Cable type	RADOX_RF_142	RADOX_RF_142	RADOX_RF_142	RADOX_RF_142
Cable length	0.37 m	0.4 m	0.31 m	0.34 m
Polarization	vertical	horizontal	vertical	vertical

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Ports				
	Port 1	Port 2	Port 3	Port 4
DC grounded	Yes	Yes	Yes	Yes

	Port 5
Port name	GNSS
Connector	TNC, plug (male)
Cable type	RADOX_RF_316_D
Cable length	0.32 m
Polarization	circular right
DC grounded	No

Connections					
	Port 1	Port 2	Port 3	Port 4	Port 5
Port name	Cellular 1	Cellular 2	Cellular 3	Cellular 4	GNSS
Band 1	✓		✓	✓	
Band 2	✓		✓	✓	
Band 3	✓		✓	✓	
Band 4		✓			
Band 5		✓			
Band 6		✓			
Band 7					✓
Band 8					✓

Electrical data LNA	
LNA is connected to	Port 5
Input voltage	3 V ... 5.5 V
Current consumption	45 mA
Noise figure	2 dB
Total gain @90° elevation	38 dBic
Remarks	This Antenna is compliant with the Radio Equipment Directive 2014/53/EU EMC: EN50121-3-2 (2016) Values for LNA power consumption, noise figure and gain are given for a 5V operating voltage and may differ slightly for a lower voltage

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Mechanical data	
Weight	7.9 kg
Dimensions	90 mm x 508.7 mm x 411.7 mm (Height x Width x Depth)
Remarks	Mounting: Shall be installed in longitudinal position to the wind/driving direction. Suitable for installation on high-speed trains with a maximum speed of 500 km/hr. 4x composite sealing washers included for silicone-free sealing of the mounting screws. Corrosion: Low corrosion design acc. to MIL-DTL-14072(E), 96 hours Salt Spray test. Cable length tolerance is +/- 10 mm (please refer to the outline drawing)

Material data	
Radome material	PC (Polycarbonate)
Radome colour	RAL 7043 (dark grey)
Back plate/base plate material	Aluminium
Back plate/base plate colour	Grey

Environmental data	
Operation temperature	-55 °C ... 85 °C
Storage temperature	-55 °C ... 85 °C
Transport temperature	-55 °C ... 85 °C
Environment (application)	Outdoor
Ingress protection (IP Rating)	Mated / IP69
Flammability rating	EN 45545-2 R24 HL3
Solar radiation	UL 746C, FI

Environmental remarks

Environmental tests: EN 50155:2022-06

§13.4.6 EN 60068-2-1:2007 Cold temperature test Ab, -55°C, 16h
 §13.4.5 EN 60068-2-2:2007 Dry heat test Be +85°C, 16h
 §13.4.7 EN 60068-2-30:2005 Damp heat cyclic test Db, +25/55°C, 2 cycles
 §13.4.10 EN 60068-2-11:2021 Salt mist test, 96h
 §13.4.11 EN 61373:2011-04 § 8, Cat. 1B Broadband Random Vibration
 §13.4.11 EN 61373:2011-04 § 9, Cat. 1B Increased Random Vibration
 §13.4.11 EN 61373:2011-04 § 10, Cat. 1B Mechanical shock
 §13.4.12 Ingress Protection EN 60529:2014-09 IP6X, IPX7, IPX9

Flammability rating: EN45545-2:2023-12, NFPA-130:2023

Additional Information

Accessories:

9091.99.0236: Cable Conduit Kit

9091.99.0235: Grounding Kit

Ordering information		
Item description	Item number	Product name
1399.99.0303	85150813	SENCITY® Rail MIMO + 4x4 Antenna with GNSS

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