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DATA SHEET

SENCITY® Rail MIMO 2x2 Low Profile Antenna with GNSS/LNA

1399.99.0077

Properties

- Railway rooftop antenna for 2G/3G/4G/5G cellular and Wi-Fi 6E bands
- Includes embedded GNSS antenna with integrated LNA supporting GPS L1, Galileo E1, BeiDou B1 and GLONASS G1
- Rugged design, meets EN 50155 Railway Standard
- Fire retardant acc. to EN 45545-2 and NFPA130
- High Voltage and High Current protection for use under catenary lines
- Extremely low profile (40mm)



Electrical data				
	Band 1	**Band 2**	**Band 3**	**Band 4**
Name	Cell/WiFi 1	Cell/WiFi 2	Cell/WiFi 3	Cell/WiFi 4
Frequency	694 MHz ... 960 MHz	1350 MHz ... 1450 MHz	1450 MHz ... 2700 MHz	3300 MHz ... 4200 MHz
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
VSWR	1.8	1.9	1.6	1.8
Gain	5 dBi	7 dBi	6.5 dBi	7.5 dBi
Isolation between Ports	15 dB	16 dB	20 dB	25 dB
Ambient Temperature	25 °C	25 °C	25 °C	25 °C
Composite Power max	40 W	40 W	40 W	40 W

	Band 5	**Band 6**	**Band 7**
Name	Cell/WiFi 5	Cell/WiFi 6	GNSS
Frequency	4900 MHz ... 5150 MHz	5150 MHz ... 7125 MHz	1559 MHz ... 1610 MHz
Impedance	50 Ω	50 Ω	50 Ω
VSWR	1.8	1.8	1.5
Gain	9 dBi	8 dBi	
Isolation between Ports	25 dB	25 dB	
Ambient Temperature	25 °C	25 °C	
Composite Power max	40 W	40 W	

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Electrical remarks	
Remarks	Indicated VSWR and gain values are valid for a metallic ground plane of 0.5 x 1 m or larger.

Ports			
	Port 1	**Port 2**	**Port 3**
Port name	Cellular 1	Cellular 2	GNSS
Connector	N, jack (female)	N, jack (female)	TNC, plug (male)
Cable type	RADOX_RF_316_D	RADOX_RF_316_D	RADOX_RF_316_D
Cable length	0.365 m	0.39 m	0.28 m
Polarization	vertical	vertical	circular right
DC grounded	Yes	Yes	No

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

Electrical data LNA	
LNA is connected to	Port 3
Input voltage	3 V ... 5 V
Current cunsumption	20 mA
Noise figure	1.6 dB
Total gain @90° elevation	30 dBic
Remarks	MTBF (h): 3000000 Values for LNA power consumption, noise figure and gain are given for a 5V operating voltage and may differ slightly for a lower voltage.

Mechanical data	
Weight	1.3 kg
Dimensions	40 mm x 108 mm x 474 mm (Height x Width x Depth)
Remarks	High-voltage-protection: no voltage on RF port, if catenary line touches antenna (EN 50124-1, 3.8 kVDC, 27.5 kVAC) High-current-protection: Designed acc. to UIC 533, DC-grounded antenna element (protection against lightning and short circuit with catenary lines(40kA/0.125s). Corrosion: Low corrosion design acc. to MIL-F-14072(E). Mounting: Shall be installed in longitudinal position to the wind/driving direction. 4x composite sealing washers included for silicone-free sealing of the mounting screws.

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Material data	
Radome material	PC (Polycarbonate)
Radome colour	RAL 7043 (dark grey)
Back plate/base plate material	Aluminum
Back plate/base plate plating	Passivated (Plating)
Back plate/base plate colour	Grey

Environmental data	
Operation temperature	-55 °C ... 85 °C
Storage temperature	-55 °C ... 85 °C
Environment (application)	Indoor/Outdoor
Ingress protection (IP Rating)	IP69
Flammability rating	EN 45545-2 R24 HL3
Solar radiation	UL 746C, F1

Environmental remarks

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

Environmental tests: EN 50155:2018-05
§13.4.6 EN 60068-2-1:2008-01 Cold temperature test Ab, -55°C, 16h
§13.4.5 EN 60068-2-2:2008-01 Dry heat test Be +85°C, 16h
§13.4.7 EN 60068-2-30:2006-06 Damp heat cyclic test Db, +25/55°C, 2 cycles
§13.4.10 EN 60068-2-11:2000-02 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, IPX5, IPX6, IPX8, IPX9

Additional Information

This product meets the Deutsche Bahn specifications for rolling stock equipment. Protected by Patents: DE202015009331(U1), US10116056(B2), CN106663861B.

Antenna accessories

Item description	Item number	Product name
9091.99.0257	85068234	SENCITY® Rail - M10 sealing washer kit
9091.99.0235	84079030	SENCITY® Rail antenna grounding kit

Antenna accessories remarks

9091.99.0257 Sencity Rail - M10 sealing washer kit
9091.99.0235 Sencity Rail antenna grounding kit

Ordering information

Item description	Item number	Product name
1399.99.0077	85106684	SENCITY® Rail MIMO 2x2 Low Profile Antenna with GNSS/LNA

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