

SENCITY® Rail MIMO Low Profile Antenna

1399.99.0077

Description

Railway rooftop antenna for Cellular and Wi-Fi bands.
 Supports 2x2 Cellular MIMO for 3G, 4G and 5G.
 Supports 2x2 Wi-Fi MIMO in all Wi-Fi 6E bands.
 Embedded combined GNSS antenna with integrated LNA.
 Supports 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.
 Ultra low profile (40mm).



Product Configuration

Technical Data

Electrical Data

	Band 1	Band 2	Band 3	Band 4
Frequency (MHz)	694 - 960	1350 - 1450	1450 - 2700	3300 - 4200
VSWR	1.8	1.9	1.6	1.8
Impedance (Ohm)	50	50	50	50
Gain (dBi)	5	7	6.5	7.5
Composite power max (W)	40	40	40	40
Ambient temperature (°C)	25	25	25	25
Port Isolation (dB)	15	16	20	25

	Band 5	Band 6	Band 7
Band Name			GNSS
Frequency (MHz)	4900 - 5150	5150 - 7125	1559 - 1610
VSWR	1.8	1.8	1.5
Impedance (Ohm)	50	50	50
Gain (dBi)	9	8	
Composite power max (W)	40	40	
Ambient temperature (°C)	25	25	
Port Isolation (dB)	25	25	

Ports

	Port 1	Port 2	Port 3
Port name	Cell/Wi-Fi 1	Cell/Wi-Fi 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 (m)	0.24	0.18	0.16
Polarization	vertical	vertical	circular right
DC grounded	Yes	Yes	No

Connections

	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7
Port 1	X	X	X	X	X	X	
Port 2	X	X	X	X	X	X	
Port 3							X

General Data

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

Electrical Data LNA

LNA noise figure dB	1.6
LNA current consumption (mA)	20
LNA is connected to	Port 3
MTBF (h)	3000000

This Antenna is compliant with the Radio Equipment Directive 2014/53/EU

EMC: EN50121-3-2 (2016)

ETSI EN 303 413 V.1.1.1 (2017-06)

ETSI EN 301 489-1 V2.2.3 (2019-03)

ETSI EN 301 489-19 V2.1.1 (2019-04)

LNA input voltage range: 3...5V

Total gain @90° elevation: 30 dBiC

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

Dimensions (mm)	40 x 108 x 474 (Height x Width x Depth)
Weight (kg)	1.3

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.

Environmental Data

Environmental conditions	indoor/outdoor
Operation temperature (°C)	-55 to 85
Storage temperature (°C)	-55 to 85
IP rating	IP69
Flammability rating	EN 45545-2 R24 HL3
Solar radiation	UL 746C, F1
2011/65/EU (RoHS - including 2015/863 and 2017/2102)	compliant acc. Annex III
Lead-free soldered	yes
WEEE 2012/19/EU	no special marking needed
ELV 2000/53/EC	compliant
REACH 1907/2006/EC	compliant

Flammability rating: EN45545-2:2013 + A1:2015, NFPA-130:2017

Tested according to ISO 4589-2:2017, NFX 70-100-1:2006, ISO 5659-2:2011.

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

Material Data

Radome colour	RAL 7043 (dark grey)
Radome material	PC (Polycarbonate)
Back plate/base plate colour	grey
Back plate/base plate material	Aluminium
Plating	Passivated (Plating)

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Related Products

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

Related Documents

Mounting instruction	DOC-0000915219
Painting instruction	DOC-0000256180
Security instruction	DOC-0000278984
Outline drawing	DOU-00464008
3D-model	DOC-0000895179
CE compliancy	DOC-0000902796

Additional Information

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