

SENCITY® Rail MIMO+ 2x2 Antenna with GNSS 1399.99.0300

Description

3-Port Railway rooftop antenna for cellular bands.
 Enables 2x2 MIMO with true polarisation diversity for high data throughput.
 Supporting 2G/3G/4G/5G bands between 790-4200 MHz.
 Average combined condition number on the supported cellular bands of <11dB.
 Embedded Dual-Band GNSS antenna with integrated LNA.
 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.



Product Configuration

Technical Data

Electrical Data

	Band 1	Band 2	Band 3	Band 4
Band Name	Vertical Polarisation	Vertical Polarisation	Vertical Polarisation	Horizontal Polarisation
Frequency (MHz)	617 - 960	1425 - 2690	3300 - 4200	790 - 960
VSWR	2.4	2.2	1.7	1.8
Impedance (Ohm)	50	50	50	50
Gain (dBi)	5	6.5	6	5
Composite power max (W)	80	80	80	80
Ambient temperature (°C)	25	25	25	25
Port Isolation (dB)	18.5	24	27	18.5

	Band 5	Band 6	Band 7	Band 8
Band Name	Horizontal Polarisation	Horizontal Polarisation	GNSS 1	GNSS 2
Frequency (MHz)	1710 - 2690	3300 - 4200	1164 - 1279	1555 - 1610
VSWR	2	2.1	1.8	1.7
Impedance (Ohm)	50	50	50	50
Gain (dBi)	9	9		
Composite power max (W)	80	80		
Ambient temperature (°C)	25	25	25	25
Port Isolation (dB)	24	27		

Ports

	Port 1	Port 2	Port 3
Port name	Vertical	Horizontal	GNSS
Connector	N, jack (female)	N, jack (female)	TNC, plug (male)
Cable Type	RADOX_RF_142	RADOX_RF_142	RADOX_RF_316_D
Cable Length (m)	0.3	0.3	0.27
Polarization	vertical	horizontal	circular right
DC grounded	Yes	Yes	no

Connections

	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8
Port 1	X	X	X					
Port 2				X	X	X		
Port 3							X	X

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General Data

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 polarised ports (no ground plane requirements). In the band 1425-1710 MHz, the VSWR of the vertically polarised port is 2.1:1. 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.

Electrical Data LNA

LNA gain (dB)	38
LNA noise figure dB	2
LNA current consumption (mA)	45
LNA is connected to	Port 3

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

EMC: EN50121-3-2 (2016)

LNA input voltage range: 3..5.5V

Total gain @90° elevation: 38 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)	84 x 368 x 425 (Height x Width x Depth)
Weight (kg)	6.90 (without packaging)

High-voltage-protection: no voltage on RF port if the catenary line touches the 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-DTL-14072(E).

Mounting: Shall be installed in longitudinal position to the wind/driving direction.

Environmental Data

Environmental conditions	outdoor
Operation temperature (°C)	-55 to 85
Storage temperature (°C)	-55 to 85
Transport 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, IPX7, 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

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Related Products

9091.99.0269 Aluminium Mounting Plate for Sencity Rail MULTI 7-Port

9091.99.0270 Steel Mounting Plate for Sencity Rail MULTI 7-Port

Related Documents

Mounting instruction	DOC-0000813531
Painting instruction	DOC-0000256180
Security instruction	DOC-0000278984

Additional Information

The antenna needs a customer specific bracket when mounted on a curved roof (not part of the delivery content of the antenna). A standard bracket is available for the antenna mounting above an existing cable breakthrough on a flat roof (Article Number 9091.99.0270). Protected by Patents: DE202015009331(U1), US10116056(B2), CN106663861B, US7327320B2, CN1765030B, AU2003218856A1, CA2521771C, SG114406, ZA200508290, CN214313519U. Further patents pending including Schweizer Patentanmeldung Nr. 01582/ 19.