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DATA SHEET

SENCITY® Rail MULTI 7-Port Antenna

1399.99.0153

Properties

- Railway rooftop antenna for 2G/3G/4G/5G cellular and Wi-Fi 6E bands
- Supports 4x4 Cellular MIMO for 3G, 4G and 5G
- Supports 2x2 Wi-Fi MIMO in all Wi-Fi 6E bands
- 4 radiators for Cellular bands and 2 radiators for Wi-Fi/WiMAX bands
- Embedded GNSS antenna with integrated LNA supports GPS L1, Galileo E1, BeiDou B1 and GLONASS G1
- Rugged design, meets EN 50155 Railway Standard
- Fire retardant according to EN 45545-2 and NFPA-130



Electrical data				
	Band 1	**Band 2**	**Band 3**	**Band 4**
Name	Cellular 1-4	Cellular 1-4	Cellular 1-4	Cellular 1-4
Frequency	694 MHz ... 960 MHz	1350 MHz ... 2700 MHz	2700 MHz ... 3300 MHz	3300 MHz ... 4900 MHz
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
VSWR	1.9	1.9	1.8	1.9
Gain	4 dBi	4.5 dBi	4.5 dBi	6 dBi
Isolation between Ports	14.5 dB	21.5 dB	25 dB	24 dB
Ambient Temperature	25 °C	25 °C	25 °C	25 °C
Composite Power max	56 W	30 W	30 W	25 W

	Band 5	**Band 6**	**Band 7**	**Band 8**
Name	Cellular 1-4	Wi-Fi 1-2	Wi-Fi 1-2	GNSS
Frequency	4900 MHz ... 5975 MHz	2400 MHz ... 2500 MHz	4900 MHz ... 5975 MHz	1559 MHz ... 1610 MHz
Impedance	50 Ω	50 Ω	50 Ω	50 Ω
VSWR	1.7	1.8	1.6	1.8
Gain	6.5 dBi	5.5 dBi	6 dBi	
Isolation between Ports	24 dB	21 dB	35 dB	

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	Band 5	Band 6	Band 7	Band 8
Ambient Temperature	25 °C	25 °C	25 °C	
Composite Power max	21 W	35 W	21 W	

Electrical remarks	
Remarks	The antenna provides 4 separate cable leads definited as "Port 1". The antenna provides 2 separate cable leads definited as "Port 2". Ground plane: VSWR and gain values are also valid for installations on non-metallic surfaces (no specific ground plane requirements). Please refer to the outline drawing to read the cable pigtail length of each port.

Ports			
	Port 1	Port 2	Port 3
Port name	Cellular 1-4	Wi-Fi 1-2	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
Polarization	vertical	vertical	circular right
DC grounded	Yes	Yes	

Connections			
	Port 1	Port 2	Port 3
Port name	Cellular 1-4	Wi-Fi 1-2	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 3
Input voltage	3 V ... 5 V
Current cunsumption	20 mA
Noise figure	1.6 dB
Total gain @90° elevation	30 dBic

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Electrical data LNA	
Remarks	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) Values for LNA power consumption, noise figure and gain are given for a 5V operating voltage and may differ slightly for a lower voltage. Antennas with production date prior to 01-Oct-2020 support only GPS and GLONASS bands between 1574 - 1610 MHz

Mechanical data	
Weight	4.9 kg
Dimensions	84 mm x 380 mm x 439.5 mm (Height x Width x Depth)
Remarks	High-voltage-protection: no voltage on RF port, if the catenary line touches antenna (EN 50124-1, 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 (EN50388, EN 50122-1, 40kA/0.1sec) Corrosion: Low corrosion design according to MIL-F-14072(E), 96 hours Salt Spray test. 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.

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

Environmental data	
Operation temperature	-40 °C ... 85 °C
Storage temperature	-55 °C ... 85 °C
Transport temperature	-40 °C ... 85 °C
Environment (application)	Outdoor
Ingress protection (IP Rating)	Mated / IP69
Flammability rating	EN 45545-2 R24 HL3
Solar radiation	UL 746C, F1

Environmental remarks

Environmental tests: EN 50155:2022-06 §12.2.3
EN 60068-2-1 Cold temperature test Ad, -55°C, 16h §12.2.4
EN 60068-2-2 Dry heat test Bd +85°C, 16h § 12.2.5
EN 60068-2-30 Damp heat cyclic test Db, +25/55°C, 2 cycles
§12.2.10 EN 60068-2-11 Salt Mist test Ka, 96h
§12.2.11 EN 61373 § 9 Random Vibration (Long life) test, Cat. 1 class B
§12.2.11 EN 61373 § 10 Mechanical shock test, Cat. 1 class B
§12.2.12 DIN EN 60529 Ingress protection test, IP69

Flammability rating: EN45545-2:2020 + A1:2015, NFPA-130:2020
Tested according to ISO 4589-2:2017, NFX 70-100-1:2006, ISO 5659-2:2011.

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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.

Antenna accessories

Item description	Item number	Product name
9091.99.0270	85104623	Steel Mounting Plate for SENCITY® Rail MULTI 7-Port
9091.99.0269	85140300	Aluminium Mounting Plate for SENCITY® Rail MULTI 7-Port

Ordering information

Item description	Item number	Product name
1399.99.0153	85104543	SENCITY® Rail MULTI 7-Port Antenna

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