

## SENCITY® Rail MULTI 5-Port Antenna

1399.99.0164

### Properties

- Railway rooftop antenna for 2G/3G/4G/5G cellular and Wi-Fi 6E bands
- Cellular 4x4 MIMO with four separate broadband integrated antennas
- Rugged design, meets EN 50155 Railway Standard
- Fire retardant according to EN 45545-2 and NFPA-130
- GNSS receiver supports GPS L1, Galileo E1, BeiDou B1, GLONASS G1 constellations



### Electrical data

|                         | Band 1              | Band 2              | Band 3                | Band 4                |
|-------------------------|---------------------|---------------------|-----------------------|-----------------------|
| Name                    | Cellular 1-4        | Cellular 1-4        | Cellular 1-4          | Cellular 1-4          |
| Frequency               | 617 MHz ... 694 MHz | 694 MHz ... 960 MHz | 1350 MHz ... 2700 MHz | 2700 MHz ... 3300 MHz |
| Impedance               | 50 Ω                | 50 Ω                | 50 Ω                  | 50 Ω                  |
| VSWR                    | 1.7                 | 1.6                 | 1.8                   | 1.8                   |
| Gain                    | 3.5 dBi             | 5 dBi               | 6 dBi                 | 6 dBi                 |
| Isolation between Ports | 13 dB               | 13 dB               | 20 dB                 | 25 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                |
|-------------------------|-----------------------|-----------------------|-----------------------|
| Name                    | Cellular 1-4          | Cellular 1-4          | GNSS                  |
| Frequency               | 3300 MHz ... 4900 MHz | 4900 MHz ... 7125 MHz | 1559 MHz ... 1610 MHz |
| Impedance               | 50 Ω                  | 50 Ω                  | 50 Ω                  |
| VSWR                    | 1.9                   | 1.7                   | 1.8                   |
| Gain                    | 6 dBi                 | 6 dBi                 |                       |
| Isolation between Ports | 25 dB                 | 25 dB                 |                       |
| Ambient Temperature     | 25 °C                 | 25 °C                 |                       |
| Composite Power max     | 80 W                  | 80 W                  |                       |

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| Electrical remarks |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Remarks            | <p>Ground plane: VSWR and gain values are also valid for installations on non-metallic surfaces (no specific ground plane requirements).<br/>Please refer to the outline drawing to read the cable pigtail length of each port.</p> <p>High-voltage-protection: no voltage on RF port, if the catenary line touches antenna (EN 50124-1, 27.5 kVAC/1min).<br/>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)</p> |

| 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_316_D   | RADOX_RF_316_D   | RADOX_RF_316_D   | RADOX_RF_316_D   |
| Polarization | vertical         | vertical         | vertical         | vertical         |
| DC grounded  | Yes              | Yes              | Yes              | Yes              |

|              | Port 5           |
|--------------|------------------|
| Port name    | GNSS             |
| Connector    | TNC, plug (male) |
| Cable type   | RADOX_RF_316_D   |
| Polarization | circular right   |
| DC grounded  |                  |

| 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      |            |            |            |            | ✓      |

| Electrical data LNA       |                                                                                                                                          |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| LNA is connected to       | Port 5                                                                                                                                   |
| Input voltage             | 3 V ... 5 V                                                                                                                              |
| Current consumption       | 20 mA                                                                                                                                    |
| Noise figure              | 1.6 dB                                                                                                                                   |
| Total gain @90° elevation | 30 dBic                                                                                                                                  |
| Remarks                   | 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          | 4.78 kg                                                                                                                                                                                                                                                             |
| Dimensions      | 84 mm x 380 mm x 439.5 mm (Height x Width x Depth)                                                                                                                                                                                                                  |
| Remarks         | Corrosion: Low corrosion design according to MIL-F-14072(E), 96 hours Salt Spray test.<br>Mounting: Shall be installed in longitudinal position to the wind/driving direction.<br>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 | Aluminium            |

| 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) | IP69               |
| Flammability rating            | EN 45545-2 R24 HL3 |
| Solar radiation                | UL 746C, FI        |
| Standards                      | Railway EN 45545   |
|                                | DIN EN 50155       |
|                                | Railway NFPA130    |

**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

**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).

This Antenna is compliant with the Radio Equipment Directive 2014/53/EU  
 EMC: EN50121-3-2 (2016)  
 ETSI EN 303 413 V1.1.1 (2017-06)  
 ETSI EN 301 489-1 V2.2.3 (2019-03)  
 ETSI EN 301 489-19 V2.1.1 (2019-04)

| Ordering information |             |                                    |
|----------------------|-------------|------------------------------------|
| Item description     | Item number | Product name                       |
| 1399.99.0164         | 85159948    | SENCITY® Rail MULTI 5-Port Antenna |

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DOCUMENT PIM-P35334 / Date of publication: 20.08.2025 / uncontrolled copy