DATA SHEET

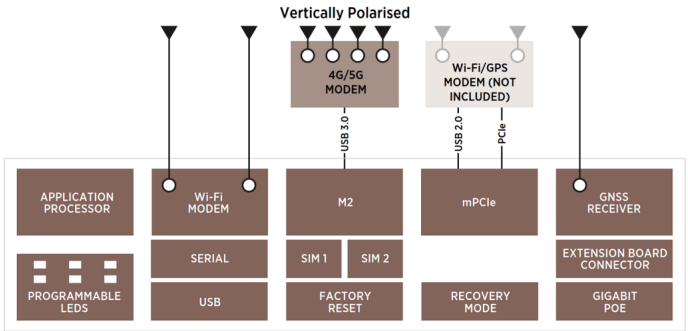
SENCITY® RAIL ACTIVE ROOFTOP

1499.00.0002

Properties

- Railway rooftop omni-directional antenna for Cellular 5G, Wi-Fi 5 and GNSS train-to-ground services.
- Includes integrated connected compute board, Cellular and Wi-Fi radio modules.
- Connection provided via a single PoE input LAN M12 X-code female 300mm pigtail.
- Supports 4x4 MIMO Cellular 5G sub-6 with 4G/3G fallback and 2x2 MU-MIMO Wi-Fi 5 Dual-band 2.4 / 5 GHz
- GNSS receiver supports GPS L1, Galileo E1, BeiDou B1, GLONASS G1 constellations

Diagram



Communication services

Radio Module:	TELIT© 5G Module FN980	
Supported Bands	5G	n1, n2, n3, n5, n7, n8, n12, n20, n25, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79 (617-5000 MHz)

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Communication services		
	4x4 MIMO	1, 2, 3, 4, 7, 25, 30, 32, 41, 42, 43, 46, 48, 66 (1710-3700 MHz)
	LTE	1, 2, 3, 4, 5, 7, 8, 12, 13, 14, 17, 18, 19, 20, 25, 26, 28, 29DL, 30, 32, 34, 38, 39, 40, 41, 42, 43, 46(LAA), 48(CRS), 66, 71*
	WCDMA	1, 2, 3, 4, 5, 6, 8, 9, 19
	Wi-Fi	802.11ac Wave 2, 2x2 MU-MIMO (5150-5850 MHz)
		802.11n Wave 1 (2400-2500 MHz)
	GNSS	GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1I, Galileo E1B/C (1559 – 1610 MHz)
Note	Supported bands also valid for installations on non-metallic surfaces (no specific ground plane requirements). For band 71 an additional ground plane of at least 500x500mm is recommended.	

Electrical data	
Processor	2x ARM Cortex-A72 1.6GHz, 4x ARM Cortex-A53 1.26GHz, 2x ARM Cortex-M4F 266MHz
Memory	4GB RAM
Storage	16GB eMMc
Operating system	Embedded Linux Debian 10, Linux 5.4 kernel operating system
Ethernet	1x LAN M12 X-code female 300mm pigtail
Power input	PoE+ Class 4 (802.3at)
Interfaces	1x M.2 key B, USB 3.0, 2x SIM slots (2FF)
	1x mPCIe , USB 2.0, PCIe
Note	Self-powered embedded Real time clock included on the electronic board.
	6x LED status indicators
	2x integrated SIM slots (2FF form factor), remote SIM module connection possible. Preinstalled firmware Debian 10, Linux 5.4 kernel operating system, preconfigured for basic connectivity.
	This Product is compliant with the Radio Equipment Directive 2014/53/EU EMC: EN50121-3-2 (2016), EN55032 (2015+A11:2020) - CISPR 32 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)

Electrical remarks	
Remarks	High-voltage-protection: no voltage on RF port, if the catenary line touches the antenna (EN 50124-1, 3.8 kVDC, 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(40kA/0.125s).

Connections
Port number

Mechanical data	
Weight	7.5 kg
Dimensions	84 mm x 368 mm x 425 mm (Heigth x Width x Depth)
Remarks	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. 4x composite sealing washers included for silicone-free sealing of the mounting screws.

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Mechanical data	
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Interface and material data	
Radome material	PC (Polycarbonate)
Radome colour	RAL 7043 (dark grey)
Back plate/base plate material	Aluminium
Back plate/base plate colour	Grey

Environmental data	
Operation temperature	-40 °C ... 85 °C
Storage temperature	-40 °C ... 85°C
Transport temperature	-40 °C ... 85°C
Environment (application)	Outdoor
Ingress protection (IP Rating)	IP69K
Flammability rating	EN 45545-2 R24 HL3
Solar radiation	UL 746C, F1

Environmental remarks

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, -40°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, IPX9K
Corrosion: Low corrosion design acc. to MIL-DTL-14072(E), 96 hours Salt Spray test.

Additional Information

Note: No application software included.

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 Numbers 9091.99.0269, 9091.99.0270).

Protected by Patents: DE202015009331(U1), US10116056(B2), CN106663861B, US7327320B2, CN1765030B, AU2003218856A1, CA2521771C, SG114406, ZA200508290.

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