RCP-1000 Series

COMPUTING PLATFORM FOR RAILWAY APPLICATIONS

westermo

MADE IN GERMANY

KEY FEATURES

- Highly flexible design with up to 7 extension modules
- Scalable performance due to SMARC standard
- Up to 4x Micro SIM cards for optional cellular interface
- Optional Wi-Fi module with up to 1300 Mbps
- 3x 1 Gigabit Ethernet, 4x RS232/422/485, 2x Display Port, 2x USB 3.0
- Optional internal SSD storage – various sizes (240 GB standard)
- Ultra-wide-range power supply 24 to 110 VDC
- Integrated GNSS
- Built-in cyber security with TPM 2.0
- BMC – Baseboard Management Controller
- Maintenance-free design
- Various mounting options – DIN rail, wall-mount, 19" sub rack
- -40 °C to +70 °C operating temperature
- EN 50155 compliant

TYPICAL APPLICATIONS

- Predictive Maintenance
- Security Gateway
- Passenger Information
- Telematics
- IoT / Cyber Security
- Diagnostic Systems

RAILWAY COMPUTING PLATFORM

The RCP-1000 is a robust, flexible computing platform designed specifically for railway applications. Its highly modular architecture supports a variety of extension modules, enabling tailored configurations to meet specific customer requirements. These extension modules are pre-assembled units, allowing for flexible system configurations and short lead times. The fanless, maintenance-free design supports multiple mounting options including DIN rail, wall, and 19" rack mounts, ensuring seamless integration into existing environments.

MULTIPLE INTERFACES

Equipped with a wide range of interfaces, the RCP-1000 is engineered to meet the demanding environmental standards of the railway industry, making it ideal for deployment in harsh conditions. Its radio extension modules support various communication standards such as LTE and 802.11ac. Each LTE module can accommodate up to four Micro SIM cards, providing optimal network coverage and maximum provider flexibility. The Wi-Fi interface ensures reliable client connections and high data throughput. Additional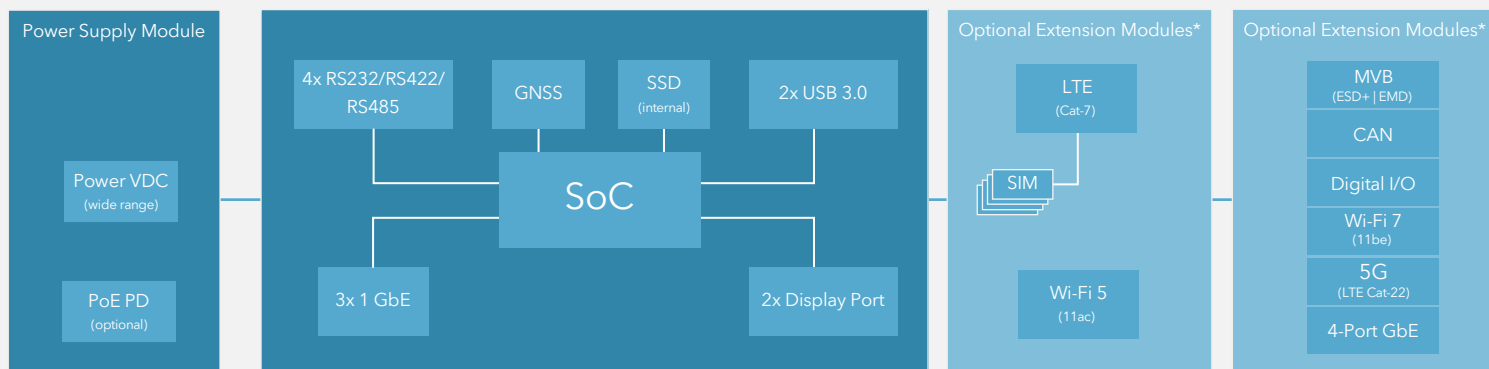ly, the system is designed to be compatible with emerging technologies like 5G and Wi-Fi 7, enhancing network efficiency and performance. Country-specific LTE/Wi-Fi standards are adopted optionally for worldwide use in every type of train.

DATA STORAGE

To enhance storage capacity, the RCP-1000 includes a dedicated mounting space for an internal M.2 solid-state drive (SSD). Connected via the CPU's dedicated SATA 3.0 interface, the SSD supports local data storage for a variety of use cases, including multimedia streaming and the logging of operational or sensor data for analysis and system monitoring.

BOARD MANAGEMENT CONTROLLER AND SECURITY FEATURES

The RCP-1000 is equipped with a Baseboard Management Controller (BMC) that provides intelligent monitoring and diagnostic capabilities. It oversees the boot process, temperature and voltage limits, and sensor logs. If deviations from predefined parameters are detected, the BMC can initiate appropriate corrective actions, thereby enhancing the system's reliability, efficiency, and security. In addition, the built-in Trusted Platform Module (TPM) 2.0 ensures platform integrity and security by protecting against unauthorized firmware or software modifications.

Power Supply Module		Optional Extension Modules*	Optional Extension Modules*

- Power VDC (wide range)
- PoE PD (optional)
- 4x RS232/RS422/RS485
- GNSS
- SSD (internal)
- 2x USB 3.0
- SoC
- 3x 1 GbE
- 2x Display Port
- LTE (Cat-7)
- SIM
- Wi-Fi 5 (11ac)
- MVB (ESD+ | EMD)
- CAN
- Digital I/O
- Wi-Fi 7 (11be)
- 5G (LTE Cat-22)
- 4-Port GbE

* in larger housing

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WESTERMO

TECHNICAL DATA

PHYSICAL INTERFACES

System Architecture	Intel Atom x5-E3930 Dual-Core CPU, up to 1.8 GHz, 2 GB RAM, 8 GB eMMC
Software	BSP / Linux based OS
Antenna	QLS connectors female
LAN	3x 10/100/1000BaseT(X), M12 X-coded 8-pin female
USB/Serial Port	2x USB 3.0 Type-A, 4x RS232/422/485 D-Sub 9-pin male
Display	2x Display Port 1.2
Mass storage	1x SSD M.2 2280, 240 GB (internal)
Power Input	M12 A-coded 4-pin male
Reset Switch	available on the front panel

ELECTRICAL SPECIFICATIONS

Power Supply	24 to 110 VDC, wide-range power supply (compliant to EN 50155)
Interruptions of Voltage Supply	EN 50155, Class S2
Power Consumption	14 W typ., 18 W max., depending on extension modules

ENVIRONMENTAL CONDITIONS

Ambient Temperature	Class OT4, -40.. +70 °C (85 °C) operating -40.. +85 °C storage
Humidity	max. 95 % non-condensing operating and storage
Altitude	Class AX, up to +2000 m
PCB Protection	conformal coating

RELIABILITY

MTBF	approx. ~148.000 h (acc. to IEC 62380) without SSD storage
Mission Profile	40 °C ambient temperature, 75 % working time ratio with 365 days annual cycle

MECHANICAL SPECIFICATIONS

Dimensions	178/249/427 x 112 x 63 mm (w h d) based on extension variants
Weight	1500 - 3500 g depending on extension modules
Housing	IP40, aluminum, conductive cooling

MODULES

LTE INTERFACE CAT-7 ADVANCED

Transfer Rates	up to 300 Mbps download / 150 Mbps upload
4G (LTE) Bands	B1,B3,B7,B8,B20,B28,B32,B38,B40,B41,B42,B43
3G Bands	B1,B5,B8
Antenna	with Diversity and MIMO

WI-FI INTERFACE IEEE 802.11 a/b/g/n/ac

Transfer Rates	up to 1300 Mbps
Frequency Range	2.412 GHz to 2.472 GHz, or 4.920 GHz to 5.825 GHz, selectable band
RF	3 RF antennas, 3x3 MIMO technology
Operational Feature	up to 128 clients per radio

GNSS INTERFACE

Frequency Band	GPS (L1), GLONASS (L1, FDMA), Galileo (E1) ready, Beidou, QZSS constellations
Protocol Standards	NMEA, RTCM 104
Accuracy	up to 1.5 m
Time To First Fix	cold start < 35 s, warm start 1 s

STANDARDS AND SPECIFICATIONS

Directive (EU) 2016/797	EN 50155 (IEC 60571)
	EN 45545-2 (HL 1 to HL 3)
	EN 61373 (Category 1, Class B)
RED – 2014/53/EU	EMC
	radio spectrum
	health & safety

OPTIONS

Mounting Adapter	DIN-rail, wall-mount, 19" sub rack mount
Extension Modules	MVB (ESD+, EMD), CAN, LTE Cat 7, Wi-Fi 5 11ac
	Future options: PoE PD, 5G, Wi-Fi 7 11be, Digital I/O, 4-Port Gigabit Ethernet

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