



# RUT986

## INDUSTRIAL GLOBAL LTE CAT 4 ROUTER



Industrial & automation



Energy & utilities



Enterprise



Retail



Smart city

### GLOBAL LTE

Ensure reliable global connectivity with Telit Cat 4 modem

### DUAL SIM & ESIM

Eliminate on site visits and manage carrier profiles at scale

### MULTIPLE INTERFACES

Connect IoT via 4 x Ethernet, serial (RS232 & RS485) and multiple I/Os

### INDUSTRIAL PROTOCOLS

Collect and transmit data via Modbus, DNP3, OPC UA & more

## Mobile

Mobile module	4G LTE Cat 4 up to 150 DL/50 UL Mbps; 3G up to 42 DL/5.76 UL Mbps; 2G up to 236.8 DL/236.8 UL Kbps
3GPP Release	Release 10
eSIM	Consumer type eSIM, profile download and removal operations, up to 7 eSIM profiles; does not include data plans
SIM switch	Dual SIM and eSIM, auto-switch cases: weak signal, data limit, SMS limit, roaming, no network, network denied, data connection fail, SIM idle protection
Status	IMSI, ICCID, operator, operator state, data connection state, network type, bandwidth, connected band, signal strength (RSSI), SINR, RSRP, RSRQ, EC/IO, RSCP, data sent/received, LAC, TAC, cell ID, ARFCN, UARFCN, EARFCN, MCC, and MNC
SMS	SMS status, SMS configuration, EMAIL to SMS, SMS to EMAIL, SMS to HTTP, SMS to SMS, scheduled SMS, SMS autoreply, SMPP
USSD	Supports sending and reading Unstructured Supplementary Service Data messages
Block/Allow list	Operator block/allow list (by country or separate operators)
Multiple PDN	Possibility to use different PDNs for multiple network access and services
Band management	Band lock, Used band status display
SIM PIN code management	SIM PIN code management enables setting, changing, or disabling the SIM card's PIN
APN	Auto APN
Bridge	Direct connection (bridge) between mobile ISP and device on LAN
Passthrough	Router assigns its mobile WAN IP address to another device on LAN

## Wireless

Wireless mode	802.11b/g/n (Wi-Fi 4), Access Point (AP), Station (STA)
Wi-Fi security	WPA2-Enterprise: PEAP, WPA2-PSK, WPA-EAP, WPA-PSK, WPA3-SAE, WPA3-EAP, OWE; AES-CCMP, TKIP, Auto-cipher modes, client separation, EAP-TLS with PKCS#12 certificates, disable auto-reconnect, 802.11w Protected Management Frames (PMF)
SSID/ESSID	SSID stealth mode and access control based on MAC address
Wi-Fi users	Up to 100 simultaneous connections
Wireless Connectivity Features	Wireless mesh (802.11s), fast roaming (802.11r), Relayd, BSS transition management (802.11v), radio resource measurement (802.11k)
Wireless MAC filter	Allowlist, blocklist
Wireless QR code generator	Once scanned, a user will automatically enter your network without needing to input login information
TravelMate	Forward Wi-Fi hotspot landing page to a subsequent connected device

## Ethernet

WAN	1 x WAN port 10/100 Mbps, compliance with IEEE 802.3, IEEE 802.3u, 802.3az standards, supports auto MDI/MDIX
LAN	3 x LAN ports, 10/100 Mbps, compliance with IEEE 802.3, IEEE 802.3u standards, supports auto MDI/MDIX

## Network

Routing	Static routing, Dynamic routing (BGP, OSPF v2, RIP v1/v2, EIGRP, NHRP), Policy based routing
Network protocols	TCP, UDP, IPv4, IPv6, ICMP, NTP, DNS, HTTP, HTTPS, SFTP(S), FTP, SMTP, SSL/TLS, ARP, VRRP, PPP, PPPoE, UPNP, SSH, DHCP, Telnet, SMPP, SNMP, MQTT, Wake On Lan (WOL), VXLAN
VoIP passthrough support	H.323 and SIP-alg protocol NAT helpers, allowing proper routing of VoIP packets
Connection monitoring	Ping Reboot, Wget Reboot, Periodic Reboot, LCP and ICMP for link inspection
Firewall	Port forward, traffic rules, custom rules, TTL target customisation
Firewall status page	View all your Firewall statistics, rules, and rule counters
Port management	View device ports, enable and disable each of them, turn auto-configuration on or off, change their transmission speed, and so on
Network topology	Visual representation of your network, showing which devices are connected to which other devices
DHCP	Static and dynamic IP allocation, DHCP relay, DHCP server configuration, status, static leases: MAC with wildcards
QoS / Smart Queue Management (SQM)	Traffic priority queuing by source/destination, service, protocol or port, WMM, 802.11e
DDNS	Supported >77 service providers, others can be configured manually
DNS over HTTPS	DNS over HTTPS proxy enables secure DNS resolution by routing DNS queries over HTTPS
Network backup	Wi-Fi WAN, Mobile, VRRP, Wired options, each of which can be used as an automatic Failover
Load balancing	Balance Internet traffic over multiple WAN connections
Hotspot	Captive portal (hotspot), internal/external Radius server, Radius MAC authentication, SMS authorisation, SSO authentication, internal/external landing page, walled garden, user scripts, URL parameters, user groups, individual user or group limitations, user management, 9 default customisable themes and optionality to upload and download customised hotspot themes
Hotspot 2.0	Hotspot 2.0 is a Wi-Fi standard that enables seamless, secure, and automatic connection to trusted wireless networks
SSHFS	Possibility to mount remote file system via SSH protocol
VRF support	Initial virtual routing and forwarding (VRF) support
Traffic Management	Real-time monitoring, wireless signal charts, traffic usage history
Port Mirroring	Mirroring network traffic on Ethernet ports for monitoring and analysis

## Security

Authentication	Pre-shared key, digital certificates, X.509 certificates, TACACS+, Internal & External RADIUS users authentication, IP & login attempts block, time-based login blocking, built-in random password generator
Firewall	Preconfigured firewall rules can be enabled via WebUI, unlimited firewall configuration via CLI, DMZ, NAT, NAT-T, NAT64
Attack prevention	DDOS prevention (SYN flood protection, SSH attack prevention, HTTP/HTTPS attack prevention), port scan prevention (SYN-FIN, SYN-RST, X-mas, NULL flags, FIN scan attacks)
VLAN	Port and tag-based VLAN separation
Mobile quota control	Mobile data limit, customizable period, start time, warning limit, phone number
WEB filter	Block list for blocking out unwanted websites, allow list for specifying allowed sites only
Access control	Flexible access control of SSH, Web interface, CLI and Telnet
Certificate Manager	Certificate creation tool allows to create CA, server, client, let's encrypt, SCEP certificates

## VPN

OpenVPN	Multiple clients and a server can run simultaneously, 27 encryption methods
OpenVPN Encryption	DES-CBC 64, RC2-CBC 128, DES-EDE-CBC 128, DES-EDE3-CBC 192, DESX-CBC 192, BF-CBC 128, RC2-40-CBC 40, CAST5-CBC 128, RC2-64-CBC 64, AES-128-CBC 128, AES-128-CFB 128, AES-128-CFB1 128, AES-128-CFB8 128, AES-128-OFB 128, AES-128-GCM 128, AES-192-CFB 192, AES-192-CFB1 192, AES-192-CFB8 192, AES-192-OFB 192, AES-192-CBC 192, AES-192-GCM 192, AES-256-GCM 256, AES-256-CFB 256, AES-256-CFB1 256, AES-256-CFB8 256, AES-256-OFB 256, AES-256-CBC 256
IPsec	XFRM, IKEv1, IKEv2, with 14 encryption methods for IPsec (3DES, DES, AES128, AES192, AES256, AES128GCM8, AES192GCM8, AES256GCM8, AES128GCM12, AES192GCM12, AES256GCM12, AES128GCM16, AES192GCM16, AES256GCM16)
GRE	GRE tunnel, GRE tunnel over IPsec support
PPTP, L2TP	Client/Server instances can run simultaneously, L2TPv3, L2TP over IPsec support
Stunnel	Proxy designed to add TLS encryption functionality to existing clients and servers without any changes in the program's code
DMVPN	Method of building scalable IPsec VPNs, Phase 2 and Phase 3 and Dual Hub support
SSTP	SSTP client instance support
ZeroTier	ZeroTier VPN client support
WireGuard	WireGuard VPN client and server support
Tinc	Tinc offers encryption, authentication and compression in it's tunnels. Client and server support.
EoIP	Ethernet over IP (EoIP) Tunneling is a MikroTik RouterOS protocol based on GRE RFC 1701 that creates an Ethernet tunnel between two routers on top of an IP connection
OpenConnect	Cross-platform multi-protocol SSL VPN client which supports a number of VPN protocols

**BacNET**

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Supported modes	Router
Supported connection types	RS485, TCP
Configuration options	Support for multiple BACnet/IP interfaces, Network number assignment, Preconfigured BDT entries for BBMD (BACnet Broadcast Management Device)

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**OPC UA**

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Supported modes	Client, Server
Supported connection types	TCP

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**MODBUS**

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Supported modes	Server, Client
Supported connection types	RTU (RS232, RS485), TCP, USB
Custom registers	MODBUS TCP custom register block requests, which read/write to a file inside the router, and can be used to extend MODBUS TCP Client functionality
Supported data formats	8-bit: INT, UINT; 16-bit: INT, UINT (MSB or LSB first); 32-bit: float, INT, UINT (ABCD (big-endian), DCBA (little-endian), CDAB, BADC), HEX, ASCII

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**Data to Server**

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Protocol	HTTP(S), MQTT, Azure MQTT
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**MQTT Gateway**

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Modbus MQTT Gateway	Allows sending commands and receiving data from MODBUS Server through MQTT broker
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**DNP3**

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Supported modes	Station, Outstation
Supported connection types	RS232, RS485, TCP, USB

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**DLMS/COSEM**

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DLMS Support	DLMS - standard protocol for utility meter data exchange
Supported modes	Client
Supported connection types	RS232, RS485, TCP

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**API**

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Teltonika Networks Web API (beta) support	Expand your device's possibilities by using a set of configurable API endpoints to retrieve or change data. For more information, please refer to this documentation: <a href="https://developers.teltonika-networks.com">https://developers.teltonika-networks.com</a>
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## Monitoring & Management

WEB UI	HTTP/HTTPS, status, configuration, FW update, CLI, troubleshoot, multiple event log servers, firmware update availability notifications, event log, system log, kernel log, Internet status
FOTA	Firmware update from server, automatic notification
SSH	SSH (v1, v2)
SMS	SMS status, SMS configuration
Call	Reboot, Status, Mobile data on/off, Output on/off, answer/hang-up with a timer, Wi-Fi on/off
TR-069	OpenACS, EasyCwmp, ACSLite, tGem, LibreACS, GenieACS, FreeACS, LibCWMP, Friendly tech, AVSystem
MQTT	MQTT Broker, MQTT publisher
SNMP	SNMP (v1, v2, v3), SNMP Trap, Brute force protection
JSON-RPC	Management API over HTTP/HTTPS
RMS	Teltonika Remote Management System (RMS)

## IoT Platforms

ThingWorx	Allows monitoring of: WAN Type, WAN IP, Mobile Operator Name, Mobile Signal Strength, Mobile Network Type
Cumulocity - Cloud of Things	Allows monitoring of: Device Model, Revision and Serial Number, WAN Type and IP, Mobile Cell ID, ICCID, IMEI, Connection Type, Operator, Signal Strength. Has reboot and firmware upgrade actions
Azure IoT Hub	Can be configured with Data to Server to send all the available parameters to the cloud. Has Direct method support which allows to execute RutOS API calls on the IoT Hub. Also has Plug and Play integration with Device Provisioning Service that allows zero-touch device provisioning to IoT Hubs
AWS IoT Core	Utility to interact with the AWS cloud platform. Jobs Support: Call the device's API using AWS Jobs functionality

## System Characteristics

CPU	Mediatek, 580 MHz, MIPS 24KEc
RAM	128 MB, DDR2
FLASH storage	32 MB, NOR Flash

**Firmware/Configuration**

WEB UI	Update FW from file, check FW on server, configuration profiles, configuration backup
FOTA	Update FW
RMS	Update FW/configuration for multiple devices at once
Keep settings	Update FW without losing current configuration
Factory settings reset	A full factory reset restores all system settings, including the IP address, PIN, and user data to the default manufacturer's configuration

**FIRMWARE CUSTOMISATION**

Operating system	RutOS (OpenWrt based Linux OS)
Supported languages	Busybox shell, Lua, C, C++
Development tools	SDK package with build environment provided
GPL customization	You can create your own custom, branded firmware and web page application by changing colours, logos, and other elements in our firmware to fit your or your clients' needs
Package Manager	The Package Manager is a service used to install additional software on the device

**Location Tracking**

GNSS	GPS, GLONASS, BeiDou, Galileo and QZSS
Coordinates	GNSS coordinates via WebUI, SMS, TAVL, RMS
NMEA	NMEA 0183
NTRIP	NTRIP protocol (Networked Transport of RTCM via Internet Protocol)
Server software	Supported server software TAVL, RMS
Geofencing	Configurable multiple geofence zones

**Serial**

RS232	DB9 connector, RS232 (with RTS, CTS flow control)
RS485	RS485 Full Duplex (4 wires) and Half Duplex (2 wires). 300-115200 baud rate
Serial functions	Console, Serial over IP, Modem, MODBUS gateway, NTRIP Client

**USB**

Data rate	USB 2.0
Applications	Samba share, USB-to-serial
External devices	Possibility to connect external HDD, flash drive, additional modem, printer, USB-serial adapter
Storage formats	FAT, FAT32, exFAT, NTFS (read-only), ext2, ext3, ext4

## Input/Output

Input	1 x digital dry input (0 - 3 V), 1 x digital galvanically isolated input (0 - 30 V), 1 x analog input (0 - 24 V; with 4-20 mA capability), 1 x Digital non-isolated input (on 4-pin power connector, 0 - 5 V detected as logic low, 8 - 30 V detected as logic high)
Output	1 x digital open collector output (30 V, 250 mA), 1 x SPST relay output (40 V, 4 A), 1 x Digital open collector output (30 V, 300 mA, on 4-pin power connector)
Events	Email, RMS, SMS
Configurable I/O	Allows to set certain I/O conditions to initiate event

## SD CARD

Physical size	Micro SD (internal)
Applications	Samba share, Storage Memory Expansion, DLNA
Capacity	Up to 2 TB
Storage formats	FAT32, NTFS, ext2, ext3, ext4

## Power

Connector	4-pin industrial DC power socket
Input voltage range	9 – 30 VDC, reverse polarity protection; surge protection >31 VDC 10us max
PoE (passive)	Passive PoE over spare pairs. Possibility to power up through LAN1 port, not compatible with IEEE802.3af, 802.3at and 802.3bt standards, Mode B, 9 - 30 VDC
Power consumption	< 2 W idle, < 7 W Max

## Physical Interfaces

Ethernet	4 x RJ45 ports, 10/100 Mbps
I/O's	2 x Inputs and 2 x Outputs on 10-pin industrial socket, 1 x Digital input and 1 x Digital output on 4-pin power connector
Status LEDs	1 x Bi-color connection status, 5 x Mobile connection strength, 4 x ETH status, 1 x Power
SIM	2 x SIM slots (Mini SIM - 2FF), 1.8 V/3 V, external SIM holders, eSIM
Power	1 x 4-pin power connector
Input/output	1 x 10-pin industrial socket for inputs/outputs
Antennas	2 x SMA for LTE, 2 x RP-SMA for Wi-Fi, 1 x SMA for GNSS
USB	1 x USB A port for external devices
RS232	1 x DB9 socket
RS485	1 x 6-pin industrial socket
Reset	Reboot/User default reset/Factory reset button

### Physical Specification

Casing material	Aluminium housing, plastic panels
Dimensions (W x H x D)	110 x 50 x 100 mm
Weight	294 g
Mounting options	DIN rail, wall mount, flat surface (all require additional kit)

### Operating Environment

Operating temperature	-40 °C to 65 °C
Operating humidity	10% to 95% non-condensing
Ingress Protection Rating	IP30

### Regulatory & Type Approvals

Regulatory	CE, UKCA, EAC, UCRF, FCC, ISED (IC), RCM, CB
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### EMC Emissions & Immunity

Standards	<b>CE/UKCA:</b> EN 55032: 2015+A11:2020+A1:2020 EN 55035: 2017+A11:2020 EN 61000-3-3: 2013+ A1:2019+A2:2021 EN IEC 61000-3-2: 2019+A1:2021+A2:2024 EN 301 489-1 V2.2.3 EN 301 489-17 V3.3.1 EN 301 489-19 V2.2.1 EN 301 489-52 V1.2.1 <b>RCM:</b> AS/NZS CISPR 32: 2015+A1:2020 <b>FCC:</b> 47 CFR Part 15 Subpart B <b>ISED (IC):</b> ICES-003: Issue 7 (October 2020)	
	ESD	EN 61000-4-2:2009
	Radiated Immunity	EN 61000-4-3:2020
	EFT	EN 61000-4-4:2012
	Surge Immunity (AC Mains Power Port)	EN 61000-4-5:2014 + A1:2017
	CS	EN 61000-4-6:2014
	DIP	EN 61000-4-11:2020

**RF**

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Standards	<p><b>CE/UKCA:</b> EN 300 328 V2.2.2 EN 301 511 V12.5.1 EN 301 908-1 V15.2.1 EN 301 908-2 V13.2.1 EN 301 908-13 V13.2.1</p> <p><b>RCM:</b> AS/NZS 4268:2017+A1:2021 AS/NZS 2772.2:2016+A1:2018 ARPANSA RPS S-1 Radiation Protection Series S-1 (Rev. 1)</p> <p><b>FCC:</b> 47 CFR Part 15 Subpart C - § 15.247 FCC Rules 47 CFR §2.1091 KDB 447498 D04 interim General RF Exposure Guidance v01</p> <p><b>ISED (IC):</b> RSS-247 Issue 3, August 2023 RSS-Gen Issue 5 Amendment 2 (February 2021) RSS-102 Issue 6, December 15, 2023</p>
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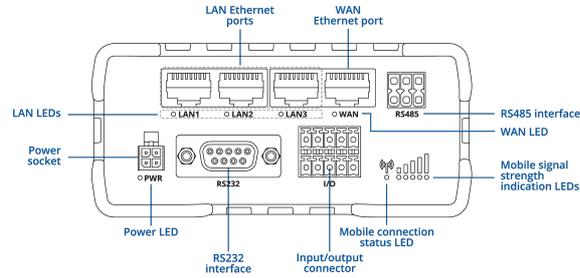
**Safety (Ordinary Locations)**

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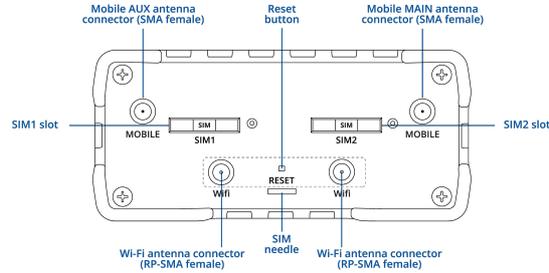
Standards	<p><b>CE:</b> EN IEC 62311:2020 <b>RCM:</b> AS/NZS 62368.1:2022 <b>CB:</b> EN IEC 62368-1:2020+A11:2020</p>
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## Hardware

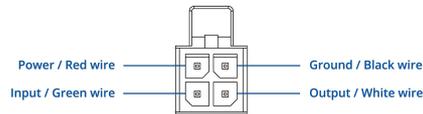
### FRONT VIEW



### BACK VIEW



### POWER SOCKET PINOUT



## Ordering

Standard package\*



RUT986



QUICK START GUIDE



9 W PSU



2 X MOBILE MAGNETIC  
SMA ANTENNAS



2 X WI-FI MAGNETIC SMA  
ANTENNAS



GNSS ADHESIVE SMA  
ANTENNA



CONNECTORS SET



ETHERNET CABLE 1.5M



SIM ADAPTER KIT

\*Standard package contents may differ based on standard order codes.

For more information on all available packaging options – please [contact us](#) directly.

## Classification codes

**HS Code:** 851762

**HTS:** 8517.62.00

### Available versions

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RUT986 0**** Global <sup>1</sup>	<b>4G:</b> B1, B2, B3, B4, B5, B7, B8, B8_US, B9, B12, B13, B14, B18, B19, B20, B25, B26, B28 <b>3G:</b> B1, B2, B4, B5, B6, B8, B19 <b>2G:</b> B2, B3, B5, B8	RUT986000000 / Standard package with EU PSU RUT986000200 / Standard package with UK PSU RUT986000300 / Standard package with US PSU RUT986000400 / Standard package with AU PSU RUT986000500 / Mass packing code
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## RUT986 spatial measurements

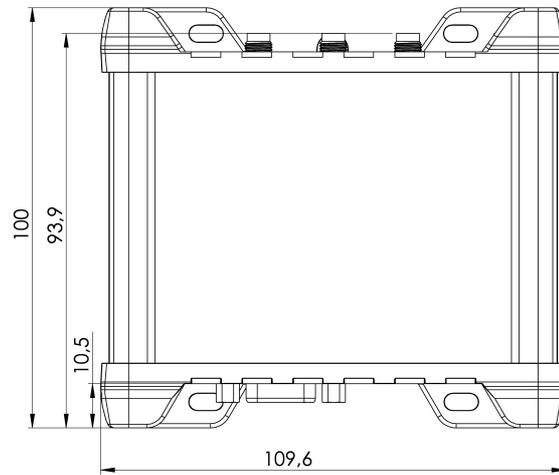
### Available versions

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Box (W x H x D):	355 x 60 x 175 mm
Device housing (W x H x D)*	110 x 50 x 100 mm

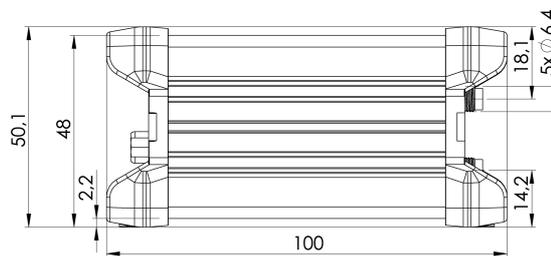
### TOP VIEW

The figure below depicts the measurements of device and its components as seen from the top:



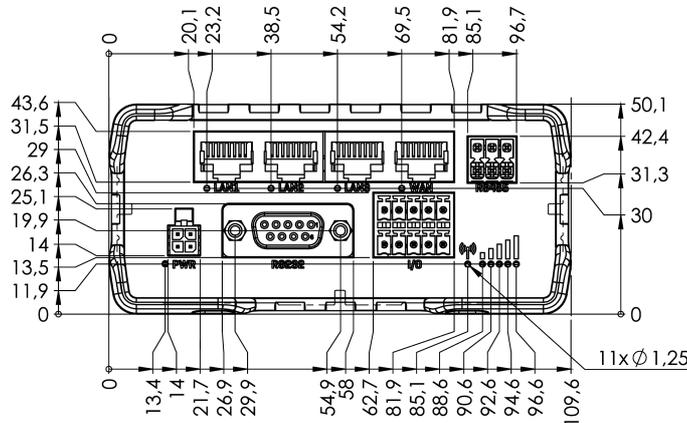
### RIGHT VIEW

The figure below depicts the measurements of device and its components as seen from the right side:



### FRONT VIEW

The figure below depicts the measurements of device and its components as seen from the front panel side:





## DIN RAIL

The scheme below depicts protrusion measurements of an attached DIN Rail:

