

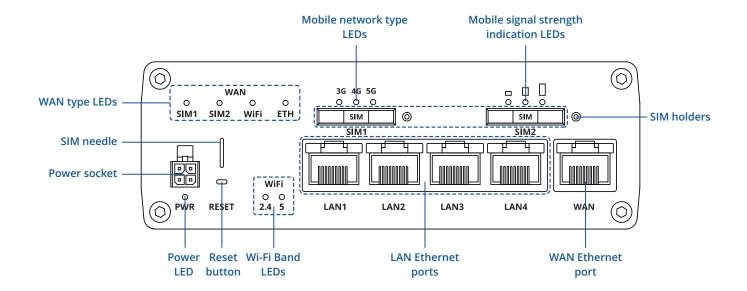
# RUTM50



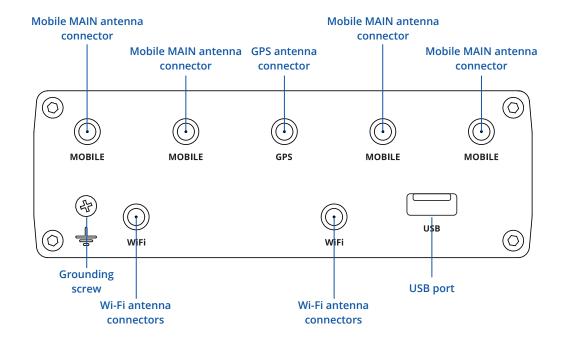


## **HARDWARE**

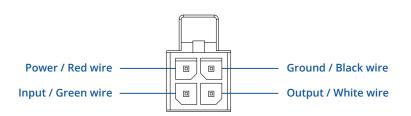
#### **FRONT VIEW**



#### **BACK VIEW**



## **POWER SOCKET PINOUT**





# **FEATURES**

## **MOBILE**

Mobile module	5G Sub-6 GHz SA, NSA 2.4, 3.4Gbps DL (4x4 MIMO) 900, 550Mbps UL (2x2 MIMO); 4G (LTE): DL Cat 19 1.6Gbps (4x4 MIMO), UL Cat 18 200Mbps	
SIM switch	2 SIM cards, auto-switch cases: weak signal, data limit, SMS limit, roaming, no network, network denied, data connection fa SIM idle protection	
Status	Signal strength (RSSI), SINR, RSRP, RSRQ, EC, IO, RSCP Bytes sent, received, connected band, IMSI, ICCID.	
SMS	SMS status, SMS configuration, send, read SMS via HTTP POST, GET, EMAIL to SMS, SMS to EMAIL, SMS to HTTP, SMS to SMS, scheduled SMS, SMS autoreply, Call utilities	
USSD	Supports sending and reading Unstructured Supplementary Service Data messages	
Black, White list	Operator black, white list	
Multiple PDN	Possibility to use different PDNs for multiple network access and services	
Band management	Band lock, Used band status display	
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/ac Wave 2 (Wi-Fi 5) with data transmission rates up to 867 Mbps (Dual Band, MU-MIMO)	
Wi-Fi security	WPA3-EAP, WPA3-SAE, WPA2-Enterprise-PEAP, WPA2-PSK, WEP; AES-CCMP, TKIP, Auto Cipher modes, client separation	
ESSID	ESSID stealth mode	
Wi-Fi users	Up to 150 simultaneous connections	
Wireless Hotspot	Captive portal (Hotspot), internal/external Radius server, SMS authorization, internal/external landing page, walled garden, user scripts, URL parameters, user groups, individual user or group limitations, user management, 9 default customizable themes	
Wireless Connectivity Features	Wireless mesh (802.11s), fast roaming (802.11r), Relayd	
Wireless MAC filter	Whitelist, blacklist	
ETHERNET		
WAN	1 x WAN port (can be configured as LAN) 10, 100, 1000 Mbps, compliance with IEEE 802.3, IEEE 802.3u, 802.3az standards, supports auto MDI, MDIX crossover	
LAN	4 x ETH ports, 10/100/1000 Mbps, supports auto MDI/MDIX crossover	
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, FTP, SMTP, SSL/TLS, ARP, VRRP, PPP, PPPoE, UPNP, SSH, DHCP, Telnet, SMPP, SMNP, MQTT, Wake On Lan (WOL)	
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 forwards, traffic rules, custom rules	
DHCP	Static and dynamic IP allocation, DHCP Relay	
QoS / Smart Queue Management (SQM)	Traffic priority queuing by source/destination, service, protocol or port, WMM, 802.11e	
DDNS	Supported >25 service providers, others can be configured manually	
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	
SSHFS	Possibility to mount remote file system via SSH protocol	
SECURITY		
Authentication		
Addicilication	Pre-shared key, digital certificates, X 509 certificates, TACACS+, Radius, IP & Login attempts block	
Firewall	Pre-shared key, digital certificates, X.509 certificates, TACACS+, Radius, IP & Login attempts block  Pre-configured firewall rules can be enabled via the Webl II. unlimited firewall configuration via CLI: NAT: NAT-T	
Firewall  Attack prevention	Pre-configured firewall rules can be enabled via the WebUI, unlimited firewall configuration via CLI; NAT; NAT-T  DDOS prevention (SYN flood protection, SSH attack prevention, HTTP/HTTPS attack prevention), port scan prevention (SYN-FIN	
Attack prevention	Pre-configured firewall rules can be enabled via the WebUI, unlimited firewall configuration via CLI; NAT; NAT-T  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	Pre-configured firewall rules can be enabled via the WebUI, unlimited firewall configuration via CLI; NAT; NAT-T  DDOS prevention (SYN flood protection, SSH attack prevention, HTTP/HTTPS attack prevention), port scan prevention (SYN-FII SYN-RST, X-mas, NULL flags, FIN scan attacks)  Port and tag-based VLAN separation	
Attack prevention  VLAN  Mobile quota control	Pre-configured firewall rules can be enabled via the WebUI, unlimited firewall configuration via CLI; NAT; NAT-T  DDOS prevention (SYN flood protection, SSH attack prevention, HTTP/HTTPS attack prevention), port scan prevention (SYN-FII SYN-RST, X-mas, NULL flags, FIN scan attacks)  Port and tag-based VLAN separation  Mobile data limit, customizable period, start time, warning limit, phone number	
Attack prevention VLAN	Pre-configured firewall rules can be enabled via the WebUI, unlimited firewall configuration via CLI; NAT; NAT-T  DDOS prevention (SYN flood protection, SSH attack prevention, HTTP/HTTPS attack prevention), port scan prevention (SYN-FII SYN-RST, X-mas, NULL flags, FIN scan attacks)  Port and tag-based VLAN separation	



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-CFB8 192, AES-192-CFB8 192, AES-192-CFB8 192, AES-192-CFB8 192, AES-192-CFB8 192, AES-256-CFB8 256, AES-256-CFB 256, AES-256-CFB8
IPsec	IKEv1, IKEv2, with 14 encryption methods for IPsec (3DES, DES, AES128, AES192, AES256, AES128GCM8, AES192GCM8, AES256GCM8, AES128GCM12, AES256GCM12, AES256GCM12, AES256GCM16, AES128GCM16, 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
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
BACNET	
Supported modes	Router
Supported connection types	TCP
OPC UA	
Supported modes	Client, Server (planned)
Supported connection types	TCP
DNP3	
Supported modes	Station, Outstation
Supported connection types	TCP, USB
MODBUS	
Supported modes	Server, Client
Supported connection types	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 Slave 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
DATA TO SERVER	
Protocols	HTTP(S), MQTT, Azure MQTT
Modbus MQTT GATEWAY	
Modbus MQTT Gateway	Allows sending commands and receiving data from MODBUS Master through MQTT broker
MONITORING & MANAGEN	MENT
WEB UI	HTTP, HTTPS, status, configuration, FW update, CLI, troubleshoot, event log, system log, kernel log
FOTA	Firmware update from server, automatic notification
SSH	SSH (v1, v2)
SMS	SMS status, SMS configuration, send, read SMS via HTTP POST, GET
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 (v1, v2, v3), SNMP trap
SNMP	Sinivir (v1, v2, v3), Sinivir tiap
	Management API over HTTP, HTTPS
JSON-RPC Modbus	·



			MS

Cloud of Things Allows monitoring of: Device data, Mobile data, Network info, Availability			
ThingWorx	Allows monitoring of: WAN Type, WAN IP, Mobile Operator Name, Mobile Signal Strength, Mobile Network Type		
Cumulocity	Allows monitoring of: Device Model, Revision and Serial Number, Mobile Cell ID, ICCID, IMEI, Connection Type, Operator, Signal Strength, WAN Type and IP		
Azure IoT Hub	Can send device IP, Number of bytes send, received, Mobile connection state, Network link state, IMEI, ICCID, Model, Manufacturer, Serial, Revision, IMSI, SIM State, PIN state, GSM signal, WCDMA RSCP, WCDMA EC, IO, LTE RSRP, LTE SINR, LTE RSRQ, CELL ID, Operator, Operator number, Connection type, Temperature, PIN count to Azure IoT Hub server		

#### SYSTEM CHARACTERISTICS

CPU	MediaTek MT7621A, Dual-Core, 880 MHz, MIPS1004Kc	
RAM	256MB DDR3	
FLASH storage	16MB serial NOR flash. 256MB serial NAND 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

#### FIRMWARE CUSTOMIZATION

Operating system	RutOS (OpenWrt based Linux OS)	
Supported languages	Busybox shell, Lua, C, C++, and Python, Java in Package manager	
Development tools	SDK package with build environment provided	

## 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	Supports server software: TAVL, RMS	
Geofencing	Multiple configurable geofence zones	

#### 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 Input, 0 - 6 V detected as logic low, 8 - 50 V detected as logic high
Output	1 x Digital Output, Open collector output, max output 50 V, 300 mA
Events	SMS, Email, RMS
I/O juggler	Allows setting certain I, O conditions to initiate event

#### **POWER**

Connector	4-pin industrial DC power socket	
Input voltage range	9 – 50 VDC, reverse polarity protection, surge protection >51 VDC 10us max	
PoE (passive)	Passive PoE over spare pairs. Possibility to power up through LAN port, not compatible with IEEE802.3af, 802.3at and 802.3bt standards, Mode B, LAN1 Port, 9 - 50 VDC	

Power consumption Idle: <5 W, Max: <18 W



#### PHYSICAL INTERFACES (PORTS, LEDS, ANTENNAS, BUTTONS, SIM)

Ethernet	5 x RJ45 ports, 10, 100, 1000 Mbps	
I/O's	1 x Digital Input, 1 x Digital Output on 4-pin power connector	
Status LEDs	$3 \times 10^{-2} \times $	
SIM	2 x SIM slot (Mini SIM – 2FF), 1.8 V, 3 V	
Power	1 x 4-pin DC power connector	
Antennas	4 x SMA for Mobile, 2 x RP-SMA for Wi-Fi, 1 x SMA for GNSS	
USB	1 x USB A port for external devices	
Reset	Reboot, User default reset, Factory reset button	
Grounding	1 x Grounding screw	

#### PHYSICAL SPECIFICATION

Casing material	Aluminum housing	
Dimensions (W x H x D) 132 x 44.2 x 95.1 mm		
Weight 519 g		
Mounting options	ns DIN rail (can be mounted on two sides), flat surface placement	

#### OPERATING ENVIRONMENT

Operating temperature	-40 °C to 75 °C
Operating humidity	10 % to 90 % non-condensing
Ingress Protection Rating	IP30

#### **REGULATORY & TYPE APPROVALS**

Regulatory	FCC, IC, PTCRB
Operator	AT&T

#### RF

Standards (Wi-Fi 2.4 GHz, 5 GHz)	47 CFR Part 15 Subpart C - § 15.247, Subpart E - § 15.407 RSS-247 Issue 2 (February 2017), RSS-Gen Issue 5 (April 2018) Amendment 2 (February 2021) KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 KDB 905462 D04 Operational Modes for DFS Testing New Rules v01
Standards (4G, 5G)	47 CFR Part 2, Part 22 Subpart H, Part 24 Subpart E, Part 27 Subpart C, Part 90 Subpart R/S, Part 96 RSS-130 Issue 2 (February 2019), RSS-132 Issue 3 (January 2013), RSS-133 Issue 6 (January 2018) Amendment, RSS-139 Issue 3 (July 2015), RSS-140 Issue 1 (April 2018), RSS-192 Issue 4 (May 2020), RSS-195 Issue 2 (April 2014), RSS-197 Issue 1 (February 2010), RSS-199 Issue 3 (December 2016), RSS-Gen Issue 5 (April 2018) Amendment 2 SRSP-503 Issue 7 (September 2008), SRSP-510 Issue 5 (February 2009), SRSP-513 Issue 3 (July 2015), SRSP-516 Issue 1 (April 2014), SRSP-517 Issue 1 (July 2014), SRSP-518 Issue 2 (February 2019), SRSP-520 Issue 2 (November 2021)

#### **EMC EMISSIONS & IMMUNITY**

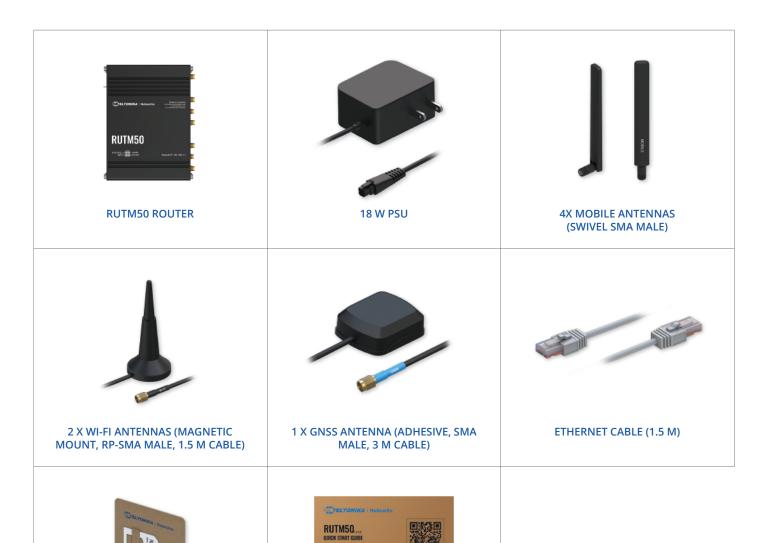
Standards	47 CFR Part 15 Subpart B ICES-003: Issue 7 (October 2020)
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# WHAT'S IN THE BOX?

#### **STANDARD PACKAGE CONTAINS\***

- RUTM50 Router
- 18 W PSU
- 4 x Mobile antennas (swivel, SMA male)
- 2 x WiFi antennas (magnetic mount, RP-SMA male, 1.5 m cable)
- 1 x GNSS antenna (adhesive, SMA male, 3 m cable)
- Ethernet cable (1.5 m)
- SIM Adapter kit
- QSG (Quick Start Guide)
- Packaging box



QSG

SIM ADAPTER KIT

<sup>\*</sup> For all standard order codes standard package contents are the same, except for PSU.



# **STANDARD ORDER CODES**

PRODUCT CODEHS CODEHTS CODEPACKAGE CONTAINSRUTM50 0000008517628517.62.00Standard package

For more information on all available packaging options – please contact us directly.

# **AVAILABLE VERSIONS**

PRODUCT CODE	REGION (OPERATOR)	FREQUENCY
RUTM50 0****	North America <sup>2</sup>	<ul> <li>5G NR NSA: n2, n5, n7, n12, n13, n14, n25, n26, n29, n30, n38, n41, n48, n66, n70, n71, n77, n78</li> <li>5G NR SA: 5G NR SA: n2, n5, n7, n12, n13, n14, n25, n26, n29, n30, n38, n41, n48, n66, n70, n71, n77, n78</li> <li>5G DL 4 × 4 MIMO: n2, n5, n7, n12, n13*, n14, n25, n26*, n29, n30, n38, n41, n48, n66, n70, n71, n77, n78</li> <li>4G (LTE-FDD): B2, B4, B5, B7, B12, B13, B14, B17, B25, B26, B29, B30, B66, B71</li> <li>4G (LTE-TDD): B38, B41, B42, B43, B48</li> </ul>

The price and lead-times for region (operator) specific versions may vary. For more information please contact us.

<sup>1 -</sup> Regional availability - excluding Russia & Belarus.



# **RUTM50 SPATIAL MEASUREMENTS & WEIGHT**

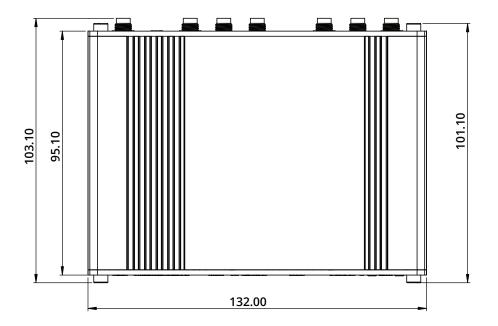
#### **MAIN MEASUREMENTS**

W x H x D dimensions for RUTM50:

Device housing\*: 132 x 44.2 x 95.1 mm Box: 355 x 60 x 175 mm

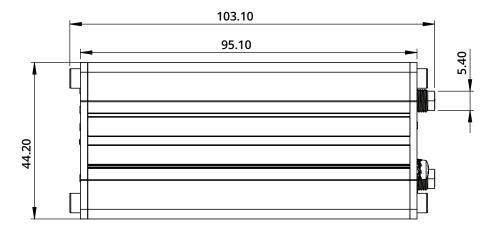
#### **TOP VIEW**

The figure below depicts the measurements of RUTM50 and its components as seen from the top:



#### **RIGHT VIEW**

The figure below depicts the measurements of RUTM50 and its components as seen from the right side:

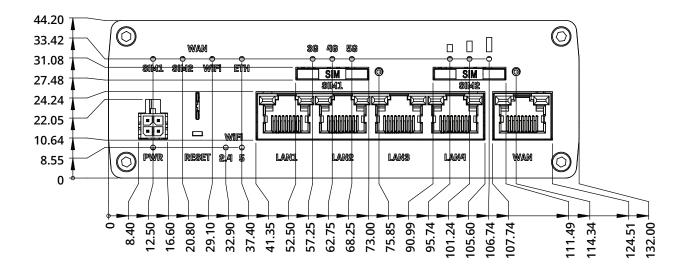


<sup>\*</sup>Housing measurements are presented without antenna connectors and screws; for measurements of other device elements look to the sections below.



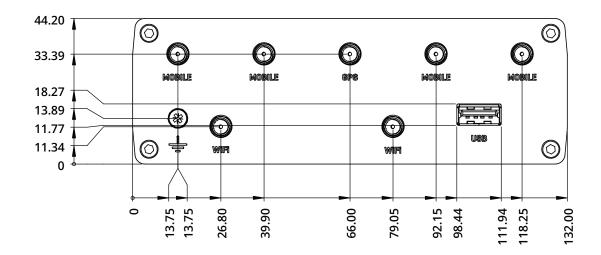
#### **FRONT VIEW**

The figure below depicts the measurements of RUTM50 and its components as seen from the front panel side:



#### **REAR VIEW**

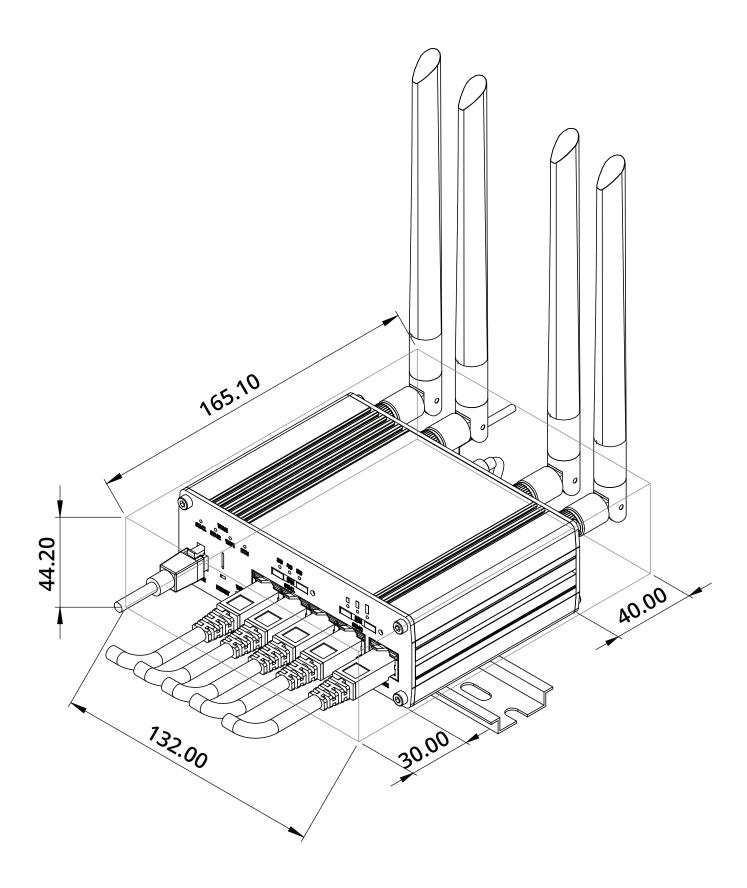
 $The figure \ below \ depicts \ the \ measurements \ of \ RUTM50 \ and \ its \ components \ as \ seen \ from \ the \ back \ panel \ side:$ 





## MOUNTING SPACE REQUIREMENTS

 $The figure \ below \ depicts \ an \ approximation \ of the \ device's \ dimensions \ when \ cables \ and \ antennas \ are \ attached:$ 





## DIN RAIL

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

