

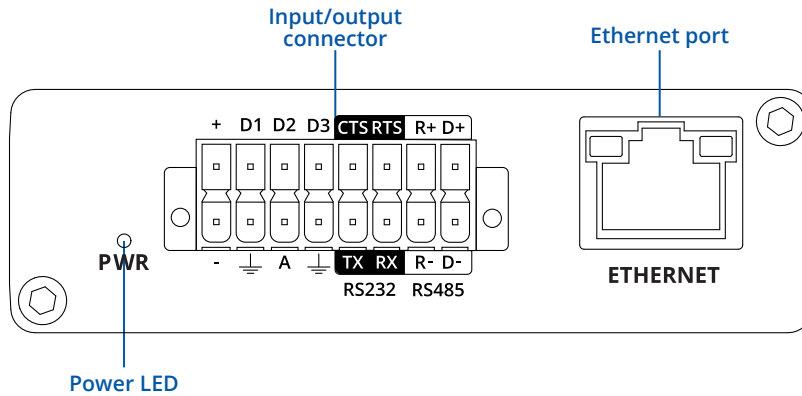


# TRB245

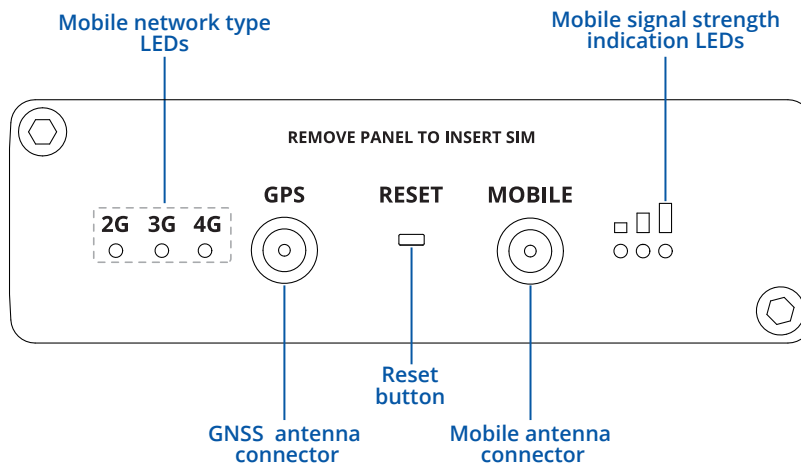


# HARDWARE

## FRONT VIEW

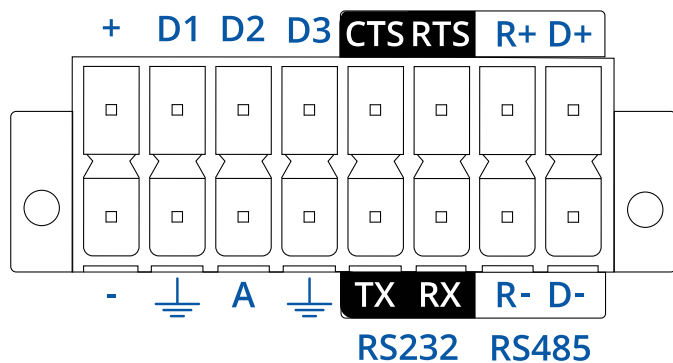


## BACK VIEW



## INPUT/OUTPUT 16 PIN CONNECTOR PINOUT

- D1, D2, D3** - Configurable digital Input/Output pins. Open collector output, max output 30 V, 300 mA or Digital input where 0-6 V detected as logic low and 8-30 V – logic high.
- +** - 9-30 VDC positive power pin
- CTS** - RS232 clear data to send pin (output).
- RTS** - RS232 request data to send pin (input).
- R+** - RS485 receiver positive signal pin.
- D+** - RS485 driver positive signal pin.
- - Negative/ground power pin.
- ⊥** - Ground pins for D1, D2, D3, A, RS232 and RS485.
- A** - Analog input pin. Analog voltage range 0-30 V.
- TX** - RS232 transmitted data (input).
- RX** - RS232 received data (output).
- R-** - RS485 receiver negative signal.
- D-** - RS485 driver negative signal.



## FEATURES

### MOBILE

Mobile module	4G (LTE) – Cat 4 up to 150 Mbps, 3G – Up to 42 Mbps, 2G – Up to 236.8 kbps
SIM switch	2 SIM cards, auto-switch cases: weak signal, data limit, SMS limit, roaming, no network, network denied, data connection fail, 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, SMPP
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

### ETHERNET

LAN	1 x LAN port, 10/100 Mbps, compliance with IEEE 802.3, IEEE 802.3u standards, supports auto MDI/MDIX
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### 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 forward, 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	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	Pre-shared key, digital certificates, X.509 certificates, TACACS+, Radius, IP & Login attempts block
Firewall	Pre-configured firewall rules can be enabled via WebUI, unlimited firewall configuration via CLI; DMZ; NAT; NAT-T
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	Blacklist for blocking out unwanted websites, Whitelist for specifying allowed sites only
Access control	Flexible access control of TCP, UDP, ICMP packets, MAC address filter

### 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	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
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

### MODBUS TCP SLAVE

ID range	Respond to one ID in range [1;255] or any
Allow Remote Access	Allow access through WAN
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

### MODBUS TCP MASTER

Supported functions	01, 02, 03, 04, 05, 06, 15, 16
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)

### MODBUS RTU MASTER (RS232)

Supported baud rates	From 300 to 115200
Supported functions	01, 02, 03, 04, 05, 06, 15, 16
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
Number of data bits	From 7 to 8
Number of stop bits	1 or 2
Parity	None, Even, Odd
Flow	None, RTS/CTS, Xon/Xoff
Duplex	Full duplex

### MODBUS RTU MASTER (RS485)

Supported baud rates	From 300 to 300000
Supported functions	01, 02, 03, 04, 05, 06, 15, 16
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
Number of data bits	7 or 8
Number of stop bits	1 or 2
Parity	None, Even, Odd
Flow	None, Xon/Xoff
Duplex	Half duplex

### DATA TO SERVER

Protocol	HTTP(S), MQTT, Azure MQTT, Kinesis
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### MQTT GATEWAY

MQTT Gateway	Allows sending commands and receiving data from MODBUS Master through MQTT broker
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### DNP3

Supported modes	TCP Master, DNP3 Outstation, RTU Master
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### MONITORING & MANAGEMENT

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
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
JSON-RPC	Management API over HTTP/HTTPS
MODBUS	MODBUS TCP status/control
RMS	Teltonika Remote Management System (RMS)

### IOT PLATFORMS

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, WAN Type and IP, Mobile Cell ID, ICCID, IMEI, Connection Type, Operator, Signal Strength
Azure IoT Hub	Can send device IP, Number of bytes send/received, Temperature, PIN count to Azure IoT Hub server, 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 RSRQ, LTE SINR, LTE RSRQ, CELL ID, Operator, Operator number, Connection type

## SYSTEM CHARACTERISTICS

CPU	Qualcomm QCA9531, MIPS 24kc, 650 MHz
RAM	64 MB, DDR2
FLASH storage	16 MB, SPI 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++
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	Supported server software TAVL, RMS
Geofencing	Configurable multiple geofence zones
Tracking sensitivity	-157 dBm
Position Accuracy	2.5m CEP

## SERIAL

RS232	Terminal block connector: TX, RX, RTS, CTS
RS485	Terminal block connector: D+, D-, R+, R- (2 or 4 wire interface)
Serial functions	Console, Serial over IP, Modem, MODBUS gateway, NTRIP Client

## INPUT / OUTPUT

Input	3 x Digital Input, 0 - 6 V detected as logic low, 8 - 30 V detected as logic high. 1 x Analog input (0 - 30 V)
Output	3 x Digital Output, Open collector output, max output 30 V, 300 mA
Events	Email, RMS, SMS
I/O juggler	Allows to set certain I/O conditions to initiate event

## POWER

Connector	2 pins in 16-pin industrial terminal block
Input voltage range	9 - 30 VDC, reverse polarity protection, surge protection +/-1 kV 50 µs max
Power consumption	Idle: < 1.2 W, Max: < 5 W

## PHYSICAL INTERFACES

Ethernet	1 x RJ45 port, 10/100 Mbps
I/O's	3 x Configurable I/O, 1 x Analog input in 16 pin terminal block
Status LEDs	3 x connection status LEDs, 3 x connection strength LEDs, 1 x power LED, 1 x Eth port status LED
SIM	2 x SIM slots (Mini SIM - 2FF), 1.8 V/3 V, double stacked SIM tray
Power	1 x 16-pin terminal block
Antennas	1 x SMA connector for LTE, 1 x SMA connector for GNSS
RS232	4 pins in 16-pin terminal block (TX, RX, RTS, CTS)
RS485	4 pins in 16-pin terminal block (D+, D-, R+, R-)
Reset	Reboot/User default reset/Factory reset button

## PHYSICAL SPECIFICATION

Casing material	Aluminum housing
Dimensions (W x H x D)	83 x 25 x 74.2 mm
Weight	165 g
Mounting options	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



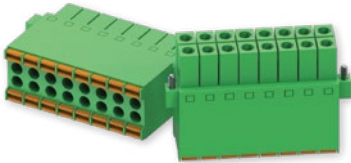

## REGULATORY & TYPE APPROVALS

Regulatory	CE/RED, UKCA, CB, EAC, UCRF, RoHS, REACH, CITC, ICASA, ANRT, RCM, NBTC, GITEKI, NTC, FCC, IC, NOM
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## WHAT'S IN THE BOX?

### STANDARD PACKAGE CONTAINS\*

- Gateway TRB245
- 9 W PSU
- 1x LTE antenna (swivel, SMA male)
- 1x GNSS antenna (adhesive, SMA male, 3 m cable)
- 16 pin terminal block
- 1x hex key
- Ethernet cable (1.5 m)
- QSG (Quick start guide)
- Packaging box

 <p><b>GATEWAY TRB245</b></p>	 <p><b>9 W PSU</b></p>	 <p><b>1X LTE ANTENNA (SWIVEL, SMA MALE)</b></p>
 <p><b>1X GNSS ANTENNA (ADHESIVE, SMA MALE, 3 M CABLE)</b></p>	 <p><b>16 PIN TERMINAL BLOCK</b></p>	 <p><b>1X HEX KEY</b></p>
 <p><b>ETHERNET CABLE (1.5 M)</b></p>	 <p><b>QSG</b></p>	

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

## STANDARD ORDER CODES

PRODUCT CODE	HS CODE	HTS CODE	PACKAGE CONTAINS
TRB245 000000	851762	8517.62.00	Standard Package with EU PSU
TRB245 100100	851762	8517.62.00	Standard Package with US PSU
TRB245 200300	851762	8517.62.00	Standard Package with AU PSU
TRB245 400800	851762	8517.62.00	Standard Package with JP PSU

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

## AVAILABLE VERSIONS

PRODUCT CODE	REGION (OPERATOR)	FREQUENCY
TRB245 0*****	Europe <sup>1</sup> , The Middle East, Africa, Thailand	<b>4G (LTE-FDD):</b> B1, B3, B7, B8, B20, B28A <b>4G (LTE-TDD):</b> B38, B40, B41 <b>3G:</b> B1, B8 <b>2G:</b> B3, B8
TRB245 1*****	North America	<b>4G (LTE-FDD):</b> B2, B4, B5, B12, B13, B14, B66, B71 <b>3G:</b> B2, B4, B5
TRB245 2*****	South America, Australia, New Zealand	<b>4G (LTE-FDD):</b> B1, B2 <sup>2</sup> , B3, B4, B5, B7, B8, B28 <b>4G (LTE-TDD):</b> B40 <b>3G:</b> B1, B2, B5, B8 <b>2G:</b> B2, B3, B5, B8
TRB245 4*****	Japan	<b>4G (LTE-FDD):</b> B1, B3, B8, B18, B19, B26 <b>4G (LTE-TDD):</b> B41 <b>3G:</b> B1, B6, B8, B19

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

- 1 - Regional availability - excluding Russia & Belarus.
- 2 - LTE-FDD B2 does not support Rx-diversity.

# TRB245 SPATIAL MEASUREMENTS & WEIGHT

## MAIN MEASUREMENTS

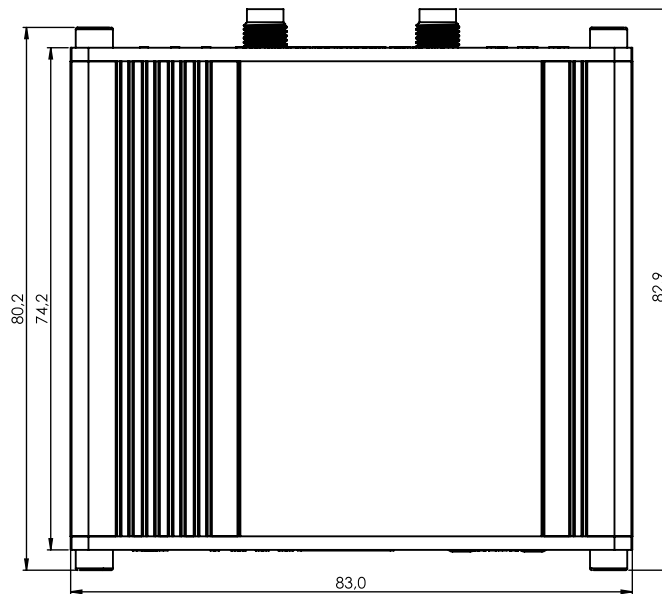
W x H x D dimensions for TRB245:

Device housing*:	83 x 25 x 74.2 mm
Box:	173 x 71 x 148 mm

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

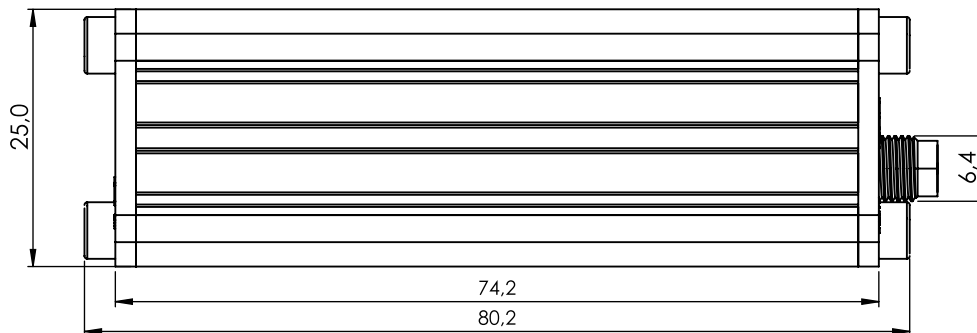
## TOP VIEW

The figure below depicts the measurements of TRB245 and its components as seen from the top:



## RIGHT VIEW

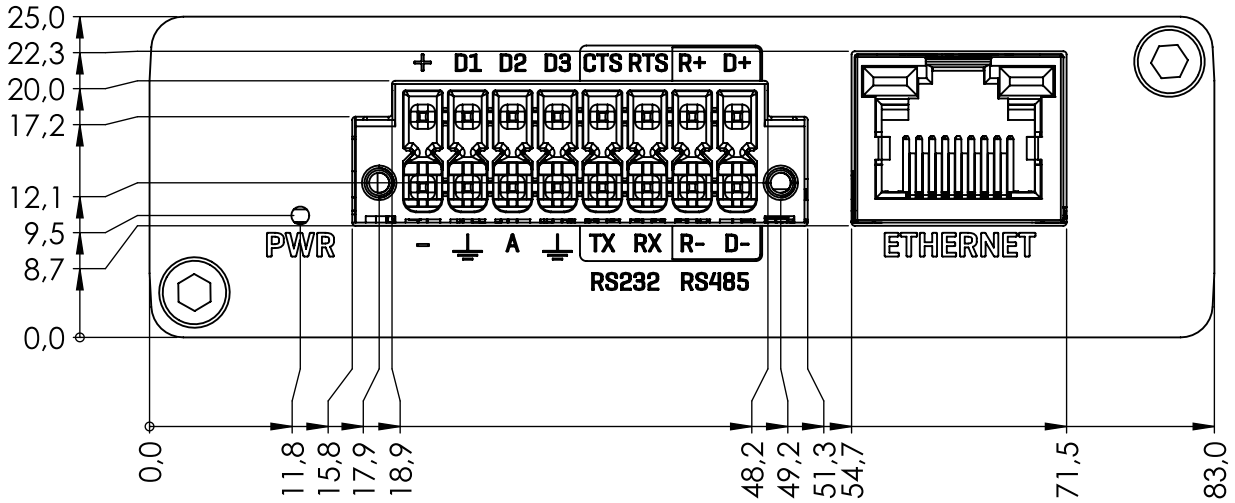
The figure below depicts the measurements of TRB245 and its components as seen from the right side:





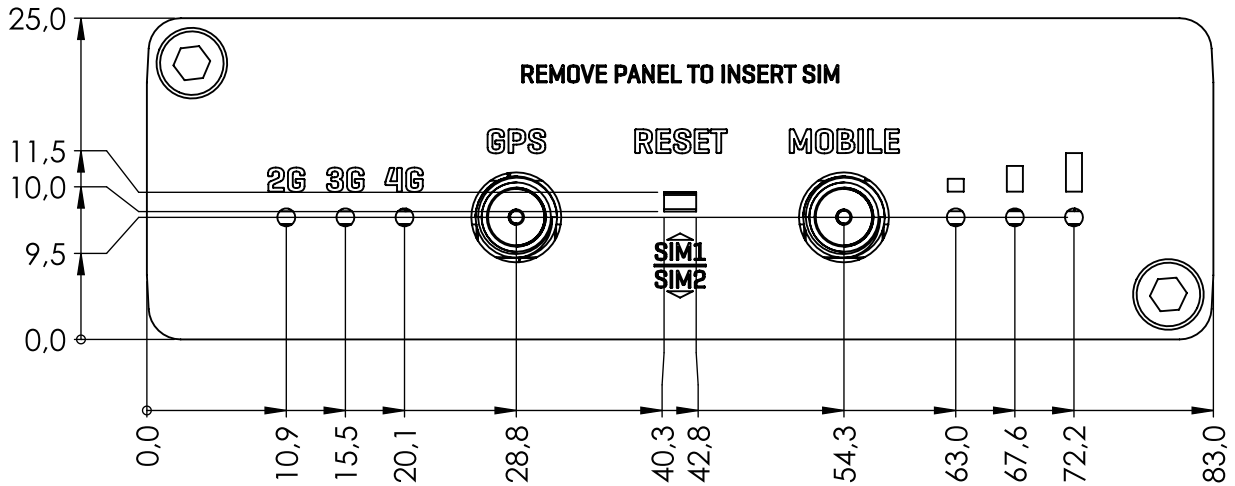
**FRONT VIEW**

The figure below depicts the measurements of TRB245 and its components as seen from the front panel side:



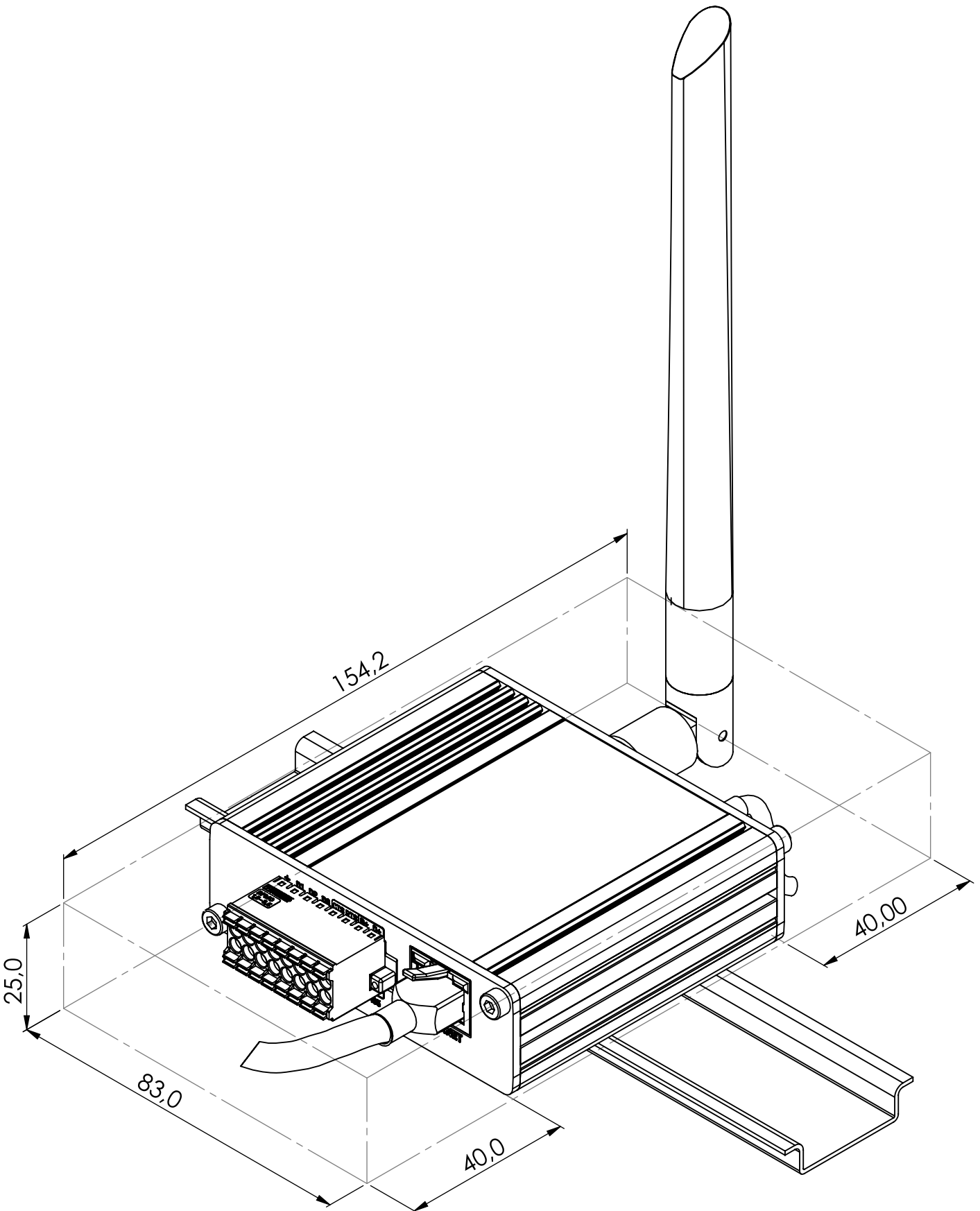
**REAR VIEW**

The figure below depicts the measurements of TRB245 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:

