

Product Specifications: 5G Router (RUTX50)

Mobile		
	Mobile module	5G Sub-6Ghz SA/NSA 2.1/3.3Gbps DL (4x4 MIMO), 900/600 Mbps UL (2x2); 4G LTE Cat 20 up to 2.0 Gbps DL/ 200M Mbps UL; 3G up to 42 DL/ 5.76 UL Mbps
	3GPP Release	Release 15/16 depending on the hardware version
	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	IMSI, ICCID, operator, operator state, data connection state, network type, CA indicator, 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, 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 (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 idle protection service	When working with devices with two SIM slots, the one not currently in use will remain idle until the device switches to it, meaning that no data is used on the card until then
	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
	Framed routing	Framed routing: support an IP network behind 5G UE

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), 802.11r fast transition, 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	ESSID stealth mode
	Wi-Fi users	Up to 150 simultaneous connections

Wireless		
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		Whitelist, blacklist
Wireless QR code generator		Once scanned, a user will automatically enter your network without needing to input login information.

Ethernet		
WAN		1 x WAN port 10/100/1000 Mbps, compliance with IEEE 802.3, IEEE 802.3u, 802.3az standards, supports auto MDI/MDIX crossover
LAN		4 x LAN ports, 10/100/1000 Mbps, compliance with IEEE 802.3, IEEE 802.3u, 802.3az standards, 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, 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
Ports 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
Hotspot		Captive portal (hotspot), internal/external Radius server, Radius MAC authentication, SMS authorisation, SSD 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
DHCP		Static and dynamic IP allocation, DHCP relay, DHCP server configuration, status, static leases: MAC with wildcards
QoS / Smart Queue		Traffic priority queuing by source/destination, service, protocol or port, WMM, 802.11e

Network		
	Management (SQM)	
	DDNS	Supported >25 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
	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

Security		
	802.1x	Port-based network access control client
	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	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 SSH, Web interface, CLI and Telnet
	SSL certificate generation	Let's encrypt support

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

VPN		
	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.
	Tailscale	Tailscale offers speed, stability, and simplicity over traditional VPNs. Encrypted point-to-point connections using the open source WireGuard protocol

OPC UA		
	Supported modes	Client, Server
	Supported connection types	TCP

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 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

Data to server		
	Protocol	HTTP(S), MQTT, Azure MQTT, Kinesis
	Data to server	Extract parameters from multiple sources and different protocols, and send them all to a single server; Custom LUA scripting, allowing scripts to utilize the router's Data to server feature

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

DNP3		
	Supported modes	Station, Outstation
	Supported connection	TCP, USB

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

Monitoring and 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, 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	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

System characteristics		
CPU	Quad-core ARM Cortex A7, 717 MHz	
RAM	256 MB (100 MB available for user space)	
FLASH storage	256 MB (80 MB available for user space)	

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++, and Python, Java in Package manager	
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	

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 - 30 V detected as logic high
	Output	1 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	4-pin industrial DC power socket
	Input voltage range	9 – 50 VDC, reverse polarity protection, surge protection >51 VDC 10us max
	PoE (passive)	Possibility to power up through LAN1 port, not compatible with IEEE802.3af, 802.3at and 802.3bt standards, Mode B, 9 - 50 VDC
	Power consumption	Idle: < 4W, Max: 18W

Physical interfaces		
	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 x connection status LEDs, 3 x connection strength LEDs, 10 x Ethernet port status LEDs, 4 x WAN status LEDs, 1 x Power LED, 2 x 2.4G and 5G Wi-Fi LEDs
	SIM	2 x SIM slots (Mini SIM – 2FF), 1.8 V/3 V
	Power	1 x 4-pin 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
	Other	1 x Grounding screw

Physical specification		
	Casing material	Aluminium housing
	Dimensions	132 x 44.2 x 95.1 mm (W x H x D)
	Weight	533 g
	Mounting options	DIN rail, wall mount, flat surface (all require additional kit)

Operating environment		
	Operating temperature	-40 °C to 75 °C

Operating environment		
	Operating humidity	10% to 90% non-condensing
	Ingress Protection Rating	IP30

Regulatory and type approvals		
	Regulatory	CE, UKCA, RCM, IMDA, CB, E-mark, SIRIM, ETSI EN 303 645, SDPPI (POSTEL)
	Operator	NOS (Portugal)

EMC emissions and immunity		
	Standards	EN 55032:2015 + A11:2021 + A1:2020 EN 55035:2017 + A11:2020 EN IEC 61000-3-2:2019 + A1:2021 EN 61000-3-3:2013 + A1:2019 + A2:2021 EN 301 489-1 V2.2.3 EN 301 489-3 V2.1.1 EN 301 489-17 V3.2.4 EN 301 489-19 V2.2.1 EN 301 489-52 V1.2.1
	ESD	EN 61000-4-2:2009
	Radiated Immunity	EN IEC 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 IEC 61000-4-11:2020

RF		
	Standards	EN 300 328 V2.2.2 EN 300 440 V2.2.1 EN 301 893 V2.1.1 EN 301 908-1 V13.1.1 EN 301 908-2 V13.1.1 EN 301 908-13 V13.1.1 EN 301 908-25 V15.1.1_15.0.6 EN 303 413 V1.2.1

Safety		
	Standards	CE: EN IEC 62368-1:2020 + A11:2020, EN 62311:2020 RCM: AS/NZS 62368.1:2022 CB: IEC 62368-1:2018