RipEX

Radio Router

- 166 kbps
- 1× ETH, 2× COM, 1× USB
- 0.1–10 watts, -40 to +70 °C
- Sleep & Save modes
- Wifi management
- Backup routes
- Fast remote access
- SW feature keys
- Native IP device

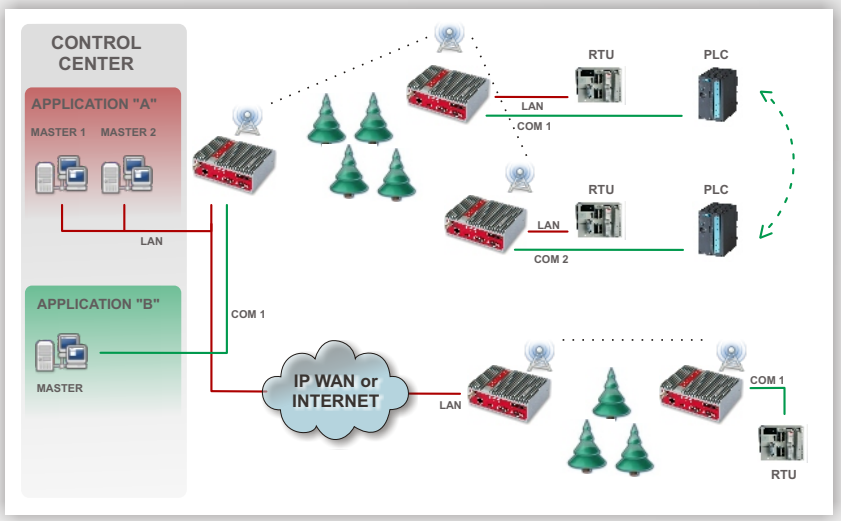
General

RipEX is a best-in-class **radio modem** renowed for overall data throughput. This Software Defined Radio with Linux OS is a native IP device which has been designed with attention to detail, performance and quality. All relevant state-of-the-art concepts have been carefully implemented.

RipEX provides 24/7 reliable service for **mission-critical applications** like SCADA & Telemetry for Utilities, SmartGrid power networks or any packet network.

Every unit can serve as the central master, a repeater, a remote terminal, or all of these simultaneously. Anti-collision protocol on Radio channel allows whatever traffic: master or even multi master-slave polling and report by exception from remotes concurrently.

Thanks to the web interface anybody with basic IP knowledge is capable of starting up RipEX within a few minutes and can maintain the network quite easily.



Applications

- Polling, Report-by-exception, Mesh
- SCADA & Telemetry
- Water, Oil & Gas
- Electricity
- Smart grid
- POS & ATM
- Lottery
- Weather

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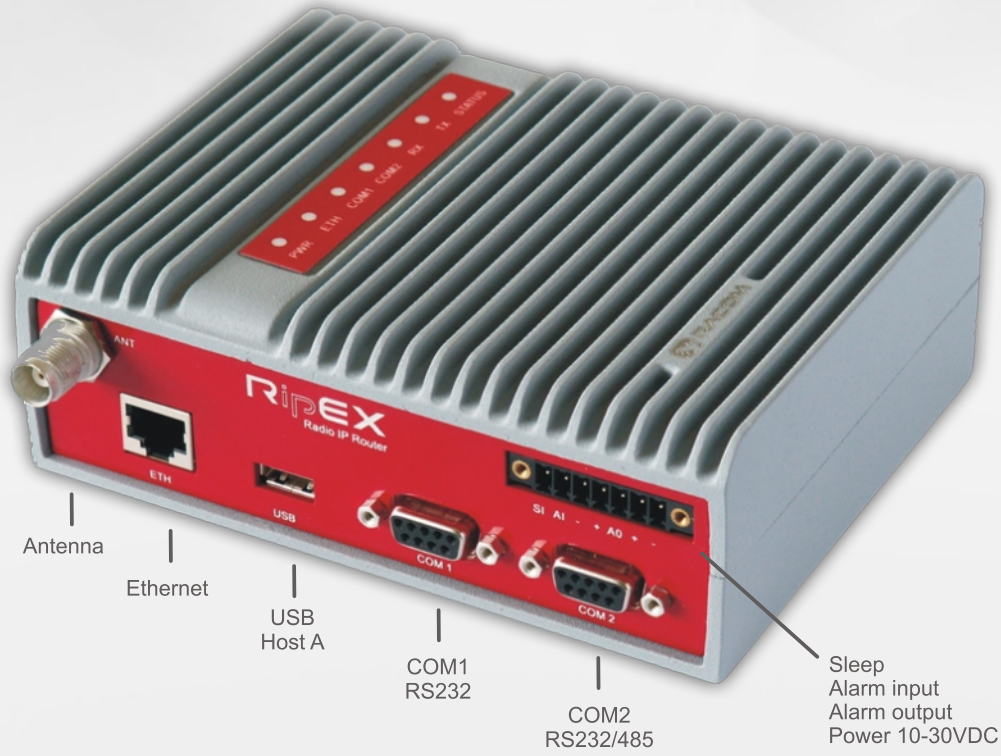
RipEX



Native IP device

- **Router mode -** RipEX works as a standard IP Router with 2 interfaces (Radio and Ethernet) and 2 COM port devices without any compromise. There is a sophisticated anti-collision protocol on Radio channel, where every single packet is acknowledged. Moreover each unit can simultaneously work as a store-and-forward repeater.
- **Bridge mode -** Packets received on any interface are broadcast to the respective interfaces on all units. Packets received on COM are broadcast to both COM1 and COM2 at remote sites, allowing you to connect 2 RTU's to each remote unit.
- **IP specialities**
  - **Terminal server** - encapsulates serial protocol to TCP(UDP) and vice versa and eliminates a transfer of TCP overhead over Radio channel, 5 independent sessions
  - **TCP proxy** - converts TCP to UDP, eliminates transfer of TCP overhead
  - **Subnets** - unlimited number of virtual Ethernet interfaces (IP aliases)
  - **VLAN** - unlimited number of VLANs assigned to Subnets
  - **ARP proxy** - any IP address simulating (for RTU's without routing capabilities within the same subnet)

Easy to configure and maintain

- **Basic** IP knowledge is sufficient
- **Web interface** or CLI via SSH
- Service access via ETH or USB/ETH or Wifi adapter
- **Wizards** - fast and simple setup
- **All** configuration **parameters within one page**
- **Fast remote access** - only the effective data are transferred over the air, html page downloaded from the local unit
- **External flash disc -** automatic configuration, SW keys and FW upgrade

Data speed & throughput

- **166 kbps / 50 kHz,** 42 kbps / 12,5 kHz, 11 kbps / 6,25 kHz
- **Optimization** - embedded optimization triples throughput on the Radio channel
- **Stream mode** - transmitting starts immediately on the Radio channel, without waiting for the end of the received frame on COM => zero latency
- **Auto-speed** - receiver is automatically adjusted to the data rate of the incoming frame

SW feature keys

- Advance features only when and where needed
- Router mode, 166/83 kbps, COM2, 10W, Backup routes
- **Free Master-key trial** - for 30 days in every RipEX

Energy savings

- **Sleep mode** - 0.1 W, triggered by Digital input
- **Save mode** - 2 W, wake up by a received packet from Radio channel or by Digital input

Radio modem & Router

Long range

- One radio hop over **50 km**, **Line of sight is not required**
- Carrier output power **0.1 - 10W**
- Exceptional data **sensitivity**
  -99 dBm / 83 kbps / 25 kHz / BER 10e-6
  -115 dBm / 10 kbps / 25 kHz / BER 10e-6
- **Any unit** can work **simultaneously as a repeater**
- Unlimited number of repeaters on the way
- Any IP network can interconnect RipEX units
- **Backup routes**
  - Tested alternative paths between two RipEX units
  - Automatic switch-over to backup gateway
  - Unlimited number of Alternative paths
  - Alternative paths priorities

SCADA protocols

- **Modbus, IEC101, DNP3, Comli, DF1, Profibus, SLIP, Siemens 3964(R), IEC104, DNP3/TCP, Modbus TCP and others**
- SCADA serial protocol addresses are mapped to RipEX addresses
- TCP(UDP) protocols can be handled transparently or using Terminal server or TCP proxy
- Each packet is transferred as an acknowledged unicast
- Sophisticated **anti-collision protocol** on Radio channel => simultaneous report by exception and multi-master polling
- Embedded **Modbus RTU / Modbus TCP converter**

Diagnostics & Network Management

- **Statistic** logs for interfaces and communication links
- Historical and on-line values displayed in **graphs**
- 20 periods (e.g. days) of **history**
- **Watched values** (RSS, Ucc, Temp, PWR, etc.) also from neighbouring units
- **SNMP** including TRAP alarms
- HW **Alarm input,** HW **Alarm output**
- **Monitoring** – on-line analysis of communication over any of the interfaces

Security & Integrity

- Licensed radio bands
- **FEC**, interleaving, proprietary data compression
- **CRC32** data integrity control on Radio channel
- Proprietary protocol on Radio channel with packet acknowledgement
- **AES256** encryption
- **Firewall** - Layer 2 – MAC, Layer 3 – IP, Layer 4 – TCP/UDP
- **Secured management** - https, ssh, access password
- SSL (own) certificate up to 2048 bits for https

Reliability

- Units **tested in a climatic chamber** as well as in real traffic
- **Heavy-duty or industrial components**
- Industrial rugged die-cast aluminium case
- **-40 to +70 °C**
- 3 years warranty

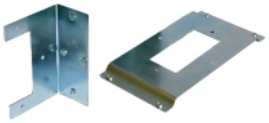
Others

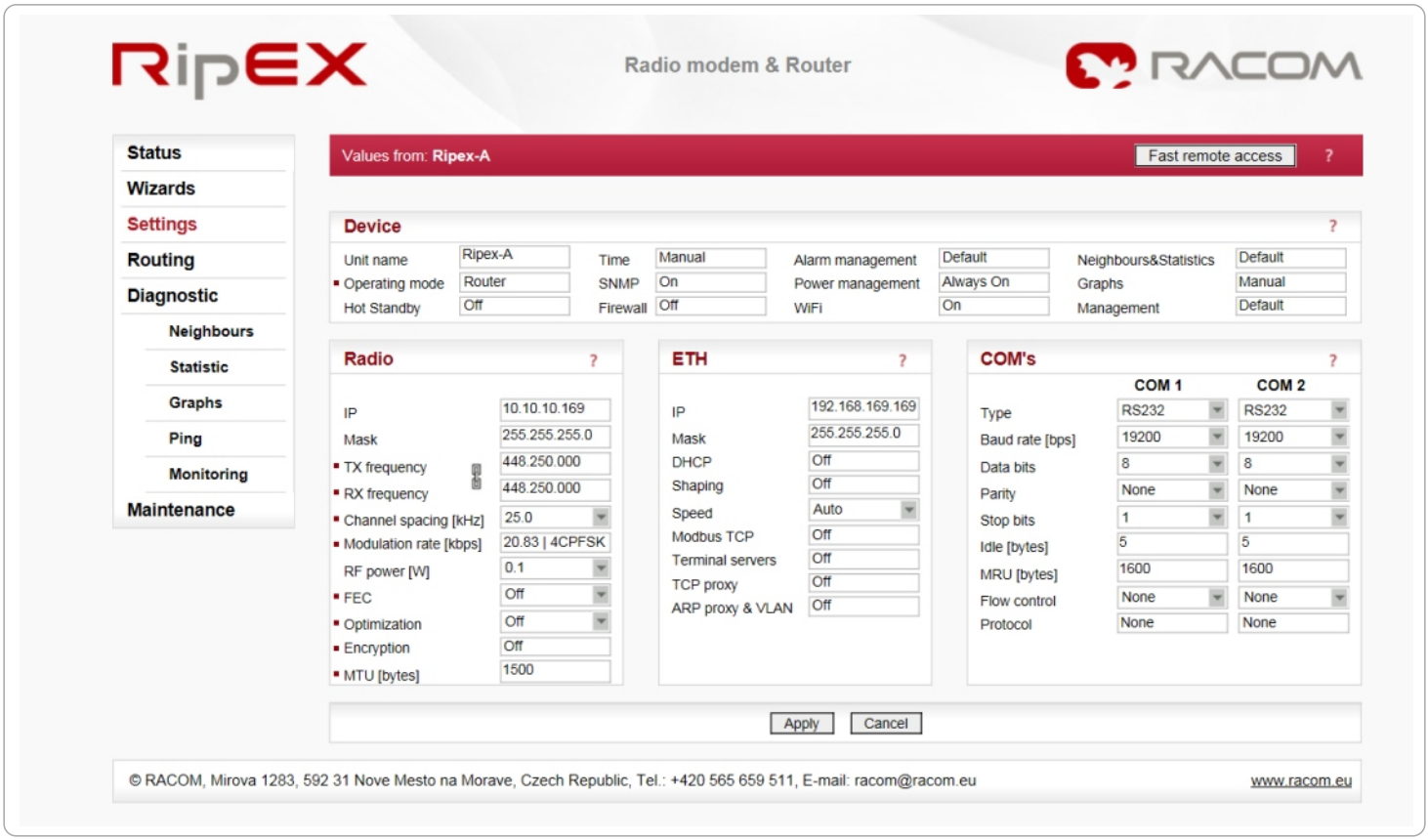
- Removable sticker plate for your notes
- DIN rail, flat, vertical or 19" rack mounting
- Separated Rx and Tx antenna connectors *
- Integrated GPS *
- Hazardous locations: Ex II 3G Ex ic IIC T4 Gc
- Substation environment: IEEE 1613 Class 1
- Vibration and shock: EN 61373:1999

* optionally

Accessories

- **RipEX-HS – redundant 19' hot standby chassis**
  - Two hot-stand-by standard RipEX units inside
  - Automatic switchover capability on detection of failure
  - For important sites where no single point of failure is required
- **Wifi adapter** – with DHCP for service access
- **Wifi/USB adapter** with DHCP for service access
- **Demo case** – the set of 3 units for bench or field tests
- **Brackets** – for flat or vertical mounting
  possible direct DIN rail mounting without brackets
- **19' rack shelves** –for single or double units
- **Others** – power supplies, antennas, cables…





Technical parameters

Radio parameters

Frequency bands	135-154; 154-174; 215-240; 300-320; 320-340; 340-360;					
	368-400; 400-432; 432-470; 470-512; 928-960 MHz					
Channel spacing	6.25 / 12.5 / 25 / 50 kHz					
Frequency stability	+/- 1.0 ppm					
Modulation	Linear: 16DEQAM, D8PSK, π/4DQPSK, DPSK					
	Exponencial (FM): 4CPFSK, 2CPFSK					
Max. Data rate	50.0 kHz	Unl.	166 kbps	CE&	139 kbps	max. 2 W
			42	FCC	42	max. 10 W
	25.0 kHz	CE	83	FCC	69	max. 2 W
			21		21	max. 10 W
	12.5 kHz	CE	42	FCC	35	max. 2 W
			10		10	max. 10 W
	6.25 kHz	CE	21	FCC	17	max. 2 W
			5		5	max. 10 W
Carrier output power	0.1 to 10 W programmable					
Duty cycle	Continuous					
Sensitivity for BER 10e-6	-99 dBm / 83 kbps / 25 kHz					
	-115 dBm / 10 kbps / 25 kHz					

Electrical

Primary power	10 to 30 VDC, negative GND
Rx	5 W / 13.8 V; 4.8 W / 24 V; (Radio part < 2 W)
Tx	5 W | 33.1 W / 13.8 V; 31.2 W / 24V
	10 W | 41.4 W / 13.8 V; 38.4 W / 24V
Sleep mode	0.1 W
Save mode	2 W

SW

Operating modes	Bridge / Router
User protocols on COM	Modbus, IEC101, DNP3, UNI, Comli, DF1, RP570,
	Profibus…
User protocols on Ethernet	Modbus TCP, IEC104, DNP3 TCP, Comli TCP
	Terminal server…
Multi master applications	Yes
Report by exception	Yes
Collision Avoidance Capability	Yes
Repeaters	Store-and-forward; Every unit; Unlimited number

Interfaces

Ethernet	10/100 Base-T Auto MDI/MDIX	RJ45
COM 1	RS232 / 300–115 200 bps	DB9F
COM 2	RS232/RS485 SW configurable	DB9F
	300–115 200 bps	
USB	USB 1.1	Host A
Antenna	50 Ohms	TNC female

Environmental

IP Code	IP40
Temperature	-40 to +70 °C / -40 to +158 °F
Humidity	5 to 95% non-condensing

Mechanical

Casing	Rugged die-cast aluminium
Dimensions	150 W x 118 D x 50 H mm (5.90 x 4.65 x 1.97 in)
Weight	1.1 kg (2.4 lbs)

Diagnostics and Management

Radio link testing	Yes (ping with RSS, Data Quality, Homogenity)
Watched values	Device – Ucc, Temp, PWR, VSWR, HW Alarm Input.
	Radio channel – RSScom, DQcom, TXLost[%]
	User interfaces – ETH[Rx/Tx], COM1[Rx/Tx],COM2[Rx/Tx]
Statistics	For Rx/Tx Packets on User interfaces (ETH, COM1,
	COM2) and for User data and Radio protocol
	(Repeates, Lost, ACK etc.) on Radio channel
Graphs	For Watched values and Statistics

Approvals

CE, FCC, ATEX, IECEx