RipEX

Radio Router

- **83 kbps / 25 kHz**
- **1xETH, 2xCOM, 1xUSB**
- **0.1 - 10 watts**
- **Sleep & Save modes**
- **- 40 to +70 °C**
- **Embedded diagnostic**
- **256 AES encryption**
- **SW feature keys**
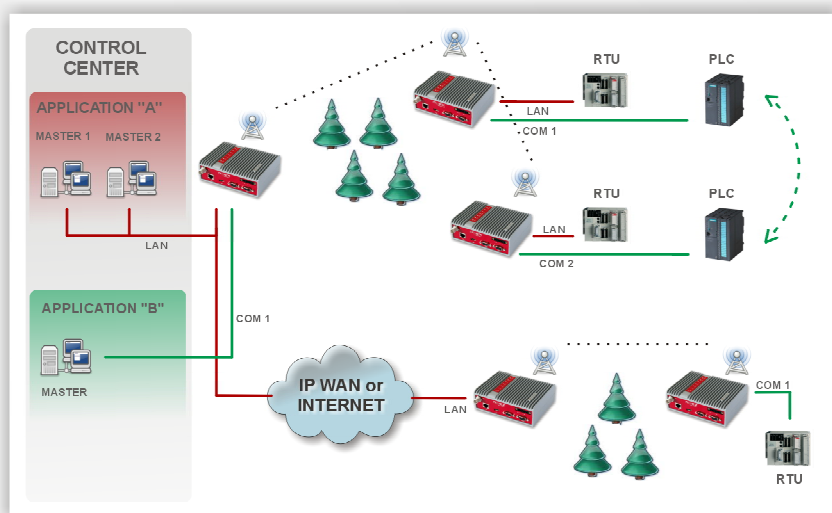- **Web interface**

General

RipEX is a best-in-class **radio modem**, not only in terms of data speed. This Software Defined Radio with Linux OS has been designed with attention to detail, performance and quality in mind. All relevant state-of-the-art concepts have been carefully implemented without any compromise.

RipEX provides 24/7 reliable service for **mission-critical applications** like SCADA & Telemetry for Utilities, Smart grid power networks or Transaction networks connecting Lottery terminals or POS or ATMs.

Every unit can serve as the central master, a repeater, a remote terminal, or all of these simultaneously. It is only a matter of easy configuration accessible from a web browser.

Anybody with basic IP knowledge is capable of starting up RipEX within a few minutes and maintain the network quite easily.
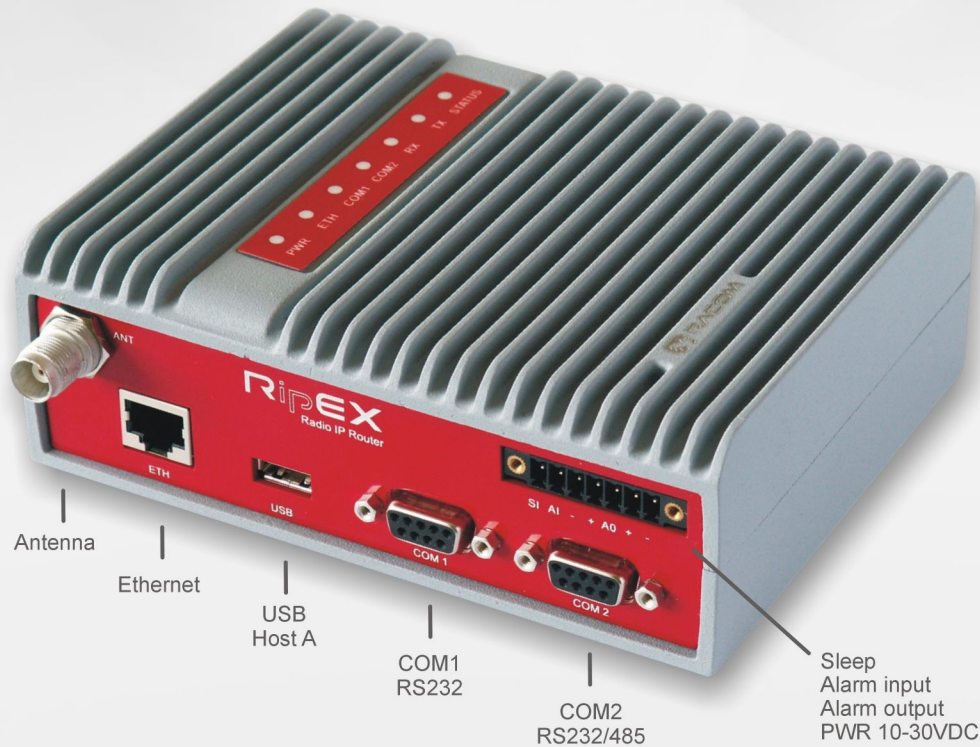
Applications

- **Water**
- **Oil & Gas**
- **Electricity**
- **Smart grid**
- **POS & ATM**
- **Lottery**
- **Weather**
- **Others**

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RipEX

- Antenna
- Ethernet
- USB Host A
- COM1 RS232
- COM2 RS232/485
- Sleep
  Alarm input
  Alarm output
  PWR 10-30VDC

Router or Bridge

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. In addition every unit can simultaneously work as a store-and-forward repeater.

Bridge mode

Packet received on any interface is broadcast to 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.
Every unit can simultaneously work as a repeater.

Easy to configure and maintain

- Ÿ **Basic** IP knowledge is sufficient
- Ÿ **Web interface**
- Ÿ Service access via ETH or USB interfaces independently. (ETH/USB adapter with DHCP is used for USB interface)
- Ÿ **Wizards** - fast and simple setup
- Ÿ **All** configuration **parameters within one page**
- Ÿ The fastest web access to remote unit: only the effective data transferred over the air, html page downloaded from the local unit.
- Ÿ CLI via SSH

Data speed

- Ÿ **83 kbps / 25 kHz**
  42 kbps / 12,5 kHz
  21 kbps / 6,25 kHz
- Ÿ **AutoSpeed** - every unit is capable to receive packets with different data speeds without changing its settings
- Ÿ **Optimization** - embedded optimization triples the throughput on the Radio channel
- Ÿ **Stream mode** - transmitting on the Radio channel starts immediately, without waiting for the end of the received frame on COM => zero latency

Pay only for what you need

- Ÿ SW authorization keys allow to use or to add advance features only when and where needed
- Ÿ **Coded features** - Router mode, 83 kbps, COM2, 10W
- Ÿ **Time limited keys** - allow to test features prior to the order

Energy savings

- Ÿ **Sleep mode** - 0.07 W, controlled via a digital input
- Ÿ **Save mode** - 1.5 W, wake up by a packet received from Radio channel, destined for the unit

Radio modem & Router

Diagnostic & Network Management

- **Embedded diagnostic & 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 generation of TRAP alarms when preset thresholds exceeded
- HW **Alarm input,** HW **Alarm output**

Security

- 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** - address filtering
- **Password** - protected access, **https** web interface

Coverage

- 160, 300, 400, 900 MHz bands
- **Line of sight is not required**
- Max. distance **more than 50 km**
- Carrier output power **0,1-10 W**
- Exceptional data **sensitivity** - typically
  - **- 98 dBm / 83 kbps / 25 kHz / BER 10e-6**
  - **- 115 dBm / 10 kbps / 25 kHz / BER 10e-6**
- High resistance to multipath propagation and interference
- **Any unit** can work **simultaneously as a repeater**
- **Unlimited number of radio hops**
- **Hybrid networks** - any IP network (Internet,3G/GPRS etc.) can interconnect RipEX units

User protocols

- **Modbus, IEC101, DNP3, Comli, DF1, Profibus, IEC104, Modbus TCP and others**
- Unique implementation - SCADA serial protocol addresses are mapped to RipEX addresses
- Each packet is transferred as an acknowledged unicast
- Sophisticated anti-collision protocol on Radio channel => report by exception from remotes, simultaneous multi-master polling
- **Terminal server** - 5 independent sessions
  - encapsulates serial protocol to TCP(UDP) and vice versa
  - eliminates a transfer of TCP overhead over Radio channel
- Embedded **Modbus RTU / Modbus TCP converter**

Reliability

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

Others

- Removable sticker plate for your notes
- DIN rail, flat or 19" rack mounting
- Demo case - the set of 3 units for your not-binding testing
- "X5" - external ETH/USB adapter with DHCP for service access via USB interface
- Separated Rx and Tx antenna connectors *
- Integrated GPS *   * optionally

Accessories

RipEX

Radio modem & Router

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Status
Wizards
Settings
Routing
Diagnostic
   Neighbours
   Statistic
   Graphs
   Ping
Maintenance

Device   ?

Unit name	ST 220	Time	Manual	Alarm management	Default
▪ Operating mode	Router	Firewall	Off	Power management	Allways On
				Neighbours&Statistics	Default
				Graphs	Default

Radio   ?

IP	10.10.10.222
Mask	255.255.255.0
TX frequency	402.100.000
RX frequency	402.100.000
RF power [W]	0.2
▪ Channel spacing [kHz]	25.0
▪ Modulation rate [kbps]	83.33 | 16DEQAM
▪ FEC	On (FEC 3/4)
▪ Optimization	On
▪ Encryption	AES 256
▪ MTU [bytes]	1500

ETH   ?

IP	192.168.141.222
Mask	255.255.255.0
GW	192.168.141.254
DHCP	Off
Shaping	Off
Speed	Auto
Modbus TCP	Detail
Terminal servers	Detail

COM's   ?

	COM 1	COM 2
Type	RS232	RS232
Baud rate [bps]	19200	38400
Data bits	8	8
Parity	None	None
Stop bits	1	1
Idle [bytes]	5	5
MRU [bytes]	1600	1600
Flow control	RTS/CTS	None
Protocol	Modbus	DNP3

Apply   Cancel

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Technical parameters

Radio parameters

Frequency bands	135–175; 290–350; 350–470; 928–960 MHz
Channel spacing	6.25 / 12.5 / 25 kHz
Frequency stability	+/- 1.0 ppm
Modulation	16DEQAM, D8PSK, π/4DQPSK, CPFSK

Data rate			
	25.0 kHz	83.33 – 62.50 – 41.67 kbps	max. 2 W
		20.83 – 10.42 kbps	max. 10 W
	12.5 kHz	41.67 – 31.25 – 20.83 kbps	max. 2 W
		10.42 – 5.21 kbps	max. 10 W
	6.25 kHz	20.83 – 15.63 – 10.42 kbps	max. 2 W
		5.21 – 2.60 kbps	max. 10 W

Carrier output power	0.1 to 10 W programmable
Duty cycle	Continuous
Sensitivity for BER 10e-6	-98 dBm / 83 kbps / 25 kHz
	-115 dBm / 10 kbps / 25 kHz
Blocking	> 84 dB

Electrical

Primary power	10 to 30 VDC
Rx	360mA / 13.8V; 200mA / 24V; 5 Watts
Tx	5W - 2.4A / 13.8V; 1.3A / 24V; 33 Watts
	10W - 3.0A / 13.8V; 1.6A / 24V; 42 Watts
Sleep mode	5mA / 13.8V; 3mA / 24V; 0.07 Watts
Save mode	120mA / 13.8V; 70mA / 24V; 1.5 Watts

SW

Operating modes	Bridge / Router
User protocols on COM	Modbus, IEC101, DNP3, UNI, Comli, DF1, Profibus...
User protocols on Ethernet	Modbus TCP/Modbus RTU convertor, IEC104, 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	DB-9
COM 2	RS232/RS485 SW configurable	DB-9
USB	USB 1.1	Host A
Antenna	50 Ohms	TNC

Enviromental

Temperature	-40 to +70 ℃
	-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)

Diagnostic and Management

Radio link testing	Yes (ping with RSS, DQ, Homogenity)
Watched values in each radiomodem	Ucc, Temp, PWR, VSWR, RSS, DQ, TxLost, Rx/Tx packets for ETH, COM1, COM2
Statistics	Rx/Tx packets on User interfaces and for User data and Radio protocol (Repeats, etc.) on Radio channel
Graphs	For Watched values and Statistics

Approvals

CE, FCC	