The Fastest Radio Modems

RipEX

RipEX is a radio modem platform providing a 24/7 reliable service for wireless data transfer in mission-critical applications like SCADA & Telemetry at critical infrastructure such as Power and Water Utilities,

Market leader

- 1.7 Mb/s, 256 QAM
- Dynamic routing
- Radio and Cellular in one
- Unlimited coverage without Base stations

Performance

- 160, 300, 400, 800, 900 MHz
- CPFSK – 256 QAM
- 6.25 – 300 kHz channels
- 10 W, Half or Full duplex

Reliability

- Industrial hardened design -40 to +70 °C
- Each unit tested in climatic chambre
- MTBF > 100 years
- Backup routes

Security

- IPsec, AES256, RADIUS
- Firewall, VLAN
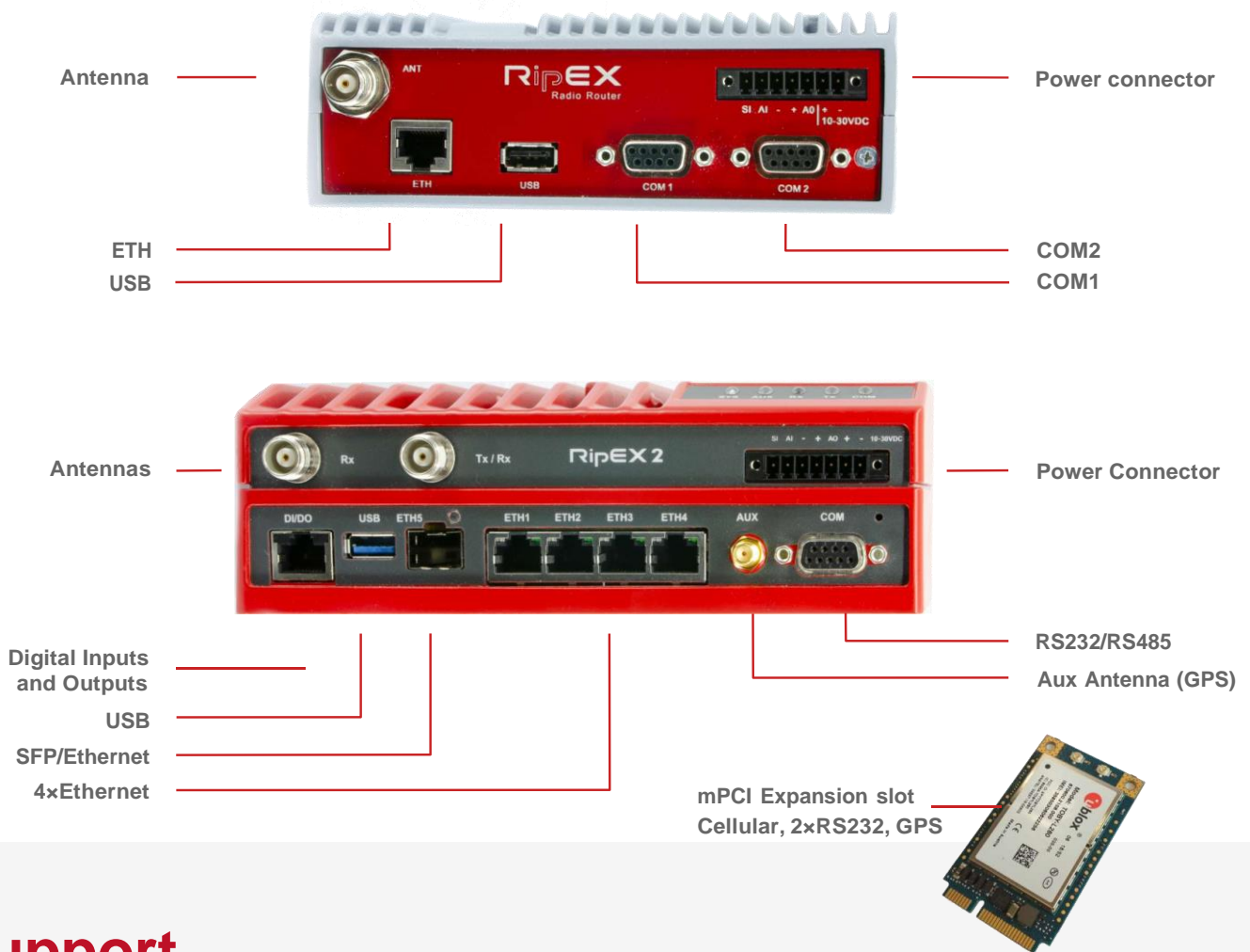- Digitally signed FW, Secure Boot
- HW tamper

RACOM

RipEX

RipEX, 1st generation, is a best-in-class compact radio modem. This native IP device with Linux has been designed with attention to detail, performance and quality. It is proven within the market since 2011 and used in thousands of installations.

RipEX2, 2nd generation, was introduced in 2018. This more powerful radio and cellular modem in one provides significant improvements, especially in terms of data speed, security and number of interfaces while all relevant state-of-the-art concepts have been carefully implemented.

	RipEX2	RipEX
Max. Speed	1.7 Mb/s @ 256QAM	166 kb/s @ 16DEQAM
Speed @ 25 kHz	167 kb/s	83 kb/s
Channel size	6.25 – 300 kHz	6.25 – 50 kHz
Interfaces	4x ETH, 1x SFP, 1x COM, 1x USB	1x ETH, 2x COM, 1x USB
IPsec	Yes	Yes
AES256	Yes	Yes
RADIUS	Yes	No
Firewall	Yes	Yes
Access	4 levels	2 levels
Full-duplex	Yes	No

Connectivity

Antenna · ETH · USB · Power connector · COM2 · COM1

Antennas · Digital Inputs and Outputs · USB · SFP/Ethernet · 4×Ethernet · Power Connector · RS232/RS485 · Aux Antenna (GPS) · mPCI Expansion slot Cellular, 2×RS232, GPS

Support

- Free HelpDesk for everyone
- Design, Radio path studies, Bids…
- Tests & Commissioning live assistance
- All technical information on the web

RACOM

www.racom.eu

Model	RipEX	RipEX2	RipEX2e
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	135–175; 285–335; 335–400; 400–470; 450–520; 803 – 897; 868 – 960 MHz	135–175; 285–335; 335–400; 400–470; 450–520; 803 – 897; 868 – 960 MHz
Channel spacing	6.25; 12.5; 25; 50 kHz	6.25; 12.5; 25; 50; 100; 150; 200; 250; 300 kHz	6.25; 12.5; 25; 50; 100; 150; 200; 250; 300 kHz
Frequency stability	+/- 1.0 ppm	+/- 0.5 ppm	+/- 0.5 ppm
Modulations	QAM: 16DEQAM, D8PSK, π/4DQPSK, DPSK FSK: 4CPFSK, 2CPFSK	QAM: 256QAM, 64QAM, 16DEQAM, D8PSK, π/4DQPSK, DPSK FSK: 4CPFSK, 2CPFSK	QAM: 64QAM, 16DEQAM, D8PSK, π/4DQPSK, DPSK FSK: 4CPFSK, 2CPFSK
FEC (Forward Error Correction)	3/4; Off	2/3; 3/4; 5/6; Off	2/3; 3/4; 5/6; Off
Gross data rate	up to 167 kb/s	up to 1.7 Mb/s	up to 250 kb/s
RF Output power	20-40 dBm PEP (0.1-10 W RMS), 9 levels programmable	20-40 dBm PEP (0.1-10 W RMS), 1 dB step programmable	20-40 dBm PEP (0.1-10 W RMS), 1 dB step programmable
Duty cycle	Continuous		
Rx to Tx Time	< 1.5 ms	< 0.7 ms @ 25 kHz; < 1 ms @ 12.5 kHz channel	< 0.7 ms @ 25 kHz; < 1 ms @ 12.5 kHz channel
Sensitivity	- 99 dBm (16DEQAM; 12.5 kHz; BER 10-6; 3/4 FEC)	- 93 dBm (256QAM; 12.5 kHz; BER 10-6; 2/3 FEC)	- 93 dBm (256QAM; 12.5 kHz; BER 10-6; 2/3 FEC)
	-111 dBm (2CPFSK; 12.5 kHz BER 10-6; 3/4 FEC)	-117 dBm (2CPFSK; 12.5 kHz BER 10-6; 3/4 FEC)	-117 dBm (2CPFSK; 12.5 kHz BER 10-6; 3/4 FEC)
Electrical			
Primary power	10 to 30 VDC, negative GND		
Rx	4.8 W @ 24 V	8.3 W @ 24 V	8.3 W @ 24 V
Tx (dependent on RF power and modulation)	13 – 38 W @ 24 V	12 – 40 W @ 24 V	12 – 40 W @ 24 V
Sleep mode	0.1 W	0.01 W	0.01 W
Save mode	2 W	5 W	5 W
Interfaces			
Ethernet	1x 10/100 Base-T Auto MDI/MDIX 1x RJ45	4x 10/100/1000 Base-T Auto MDI/MDIX 4x RJ45	2x 10/100/1000 Base-T Auto MDI/MDIX 2x RJ45
SFP	No	1x 10/100/1000 Base or T/1000Base-SX or 1000Base-LX 1x SFP	No
Serial	1x RS232 1x DB9F 1x RS232/RS485 SW configurable 300 b/s – 115 kb/s 1x DB	1x RS232/RS485 SW configurable 2x RS232 (mPCIe expansion board) 600 b/s – 1 Mb/s 1x DB9F 1x RJ45	1x RS232/RS485 SW configurable 2x RS232 (mPCIe expansion board) 600 b/s – 1 Mb/s 1x DB9F
USB	USB 1.1 / Host A	USB 3.0 / Host A	USB 3.0 / Host A
Antenna	1x TNC female @ 50 ohms (Rx/Tx) or 2x TNC (1x Rx + 1x Tx) - different HW model	2x TNC female @ 50 ohms SW configurable: 1x Rx/Tx or 1x Rx + 1x Tx	1x TNC female @ 50 ohms (Rx/Tx) or 2x TNC (1x Rx + 1x Tx) - different HW model SW configurable: 1x Rx/Tx or 1x Rx + 1x Tx
Inputs/Outputs	1x HW alarm input, 1x HW alarm output, 1x Sleep input	1x HW alarm input, 1x HW alarm output, 1x Sleep input, 2x DI, 2x DO, 1x difDI (when mPCIe-COMS is not used)	1x HW alarm input, 1x HW alarm output, 1x Sleep input, 2x DI, 2x DO, 1x difDI
Optional Expansions	GPS	1x mPCI: Cellular module or 2x RS232 or GPS	No
Indication LEDs			
LED panel	7x tri-color status LEDs (Power, ETH, COM1, COM2, Rx, Tx, Status)	5x tri-color status LEDs (SYS, AUX, RX, TX, COM)	5x tri-color status LEDs (SYS, AUX, RX, TX, COM)
ETH		4x RJ45 (Link and Activity LEDs), 1× SFP (Status LED)	2x RJ45 (Link and Activity LEDs), 1× SFP (Status LED)
Environmental			
IP Code (Ingress Protection)	IP40, IP51	IP41, IP42, IP52	IP41, IP42, IP52
MTBF (Mean Time Between Failure)	> 900.000 hours (> 100 years)		
Operating temperature	- 40 to +70 °C (- 40 to +158 °F)		
Operating humidity	5 to 95% non-condensing		

Model	RipEX	RipEX2	RipEX2e
Mechanical			
Casing	Rugged die-cast aluminium		
Dimensions	50 H x 150 W x 118 D mm (1.97 x 5.9 x 4.65 in)	60 H x 185 W x 125 D mm (2.34 x 7.2 x 4.9 in)	60 H x 185 W x 125 D mm (2.34 x 7.2 x 4.9 in)
Weight	1.1 kg (2.4 lbs)	1.55 kg (3.4 lbs)	1.55 kg (3.4 lbs)
Mounting	DIN rail, L-bracket, Flat-bracket, 19" Rack chassis		
Radio channel			
Radio protocols	Transparent @ Bridge; Flexible, Base driven @ Router		
Routing (Radio channel included)	Static, Backup routes	Static, Dynamic	Static, Dynamic
Multi master applications	Yes		
Report by exception	Yes		
Collision Avoidance Capability	Yes		
Remote to Remote communication	Yes		
Repeaters	Store-and-forward; Every unit; Unlimited number		
QoS	8 levels on all interfaces, Radio included		
SCADA protocols			
Serial	DNP3, DF1, IEC101, Modbus RTU, PR2000, RDS, Siemens 3964(R), COMLI, SAIA S-bus, Mars-A, UNI, Async Link…		
Ethernet	Modbus TCP, IEC104, DNP3 TCP, Comli TCP…		
Serial to IP convertors	Modbus RTU / Modbus TCP, DNP3 / DNP3 TCP, Terminal server		
Security			
Management	HTTPS (Web), SSH (CLI)		
Role-based access control (RBAC)	2 levels (Guest, Admin)	4 levels (Guest, Tech, SecTech, Admin)	4 levels (Guest, Tech, SecTech, Admin)
Encryption	AES256 - CCM		
VPN	IPsec, GRE		
VLAN	IEEE 802.1Q (tagging), Q-in-Q for Transparent mode		
AAA protocol	No	RADIUS	RADIUS
Firewall	Layer 2 - MAC, Layer 3 - IP, Layer 4 - TCP/UDP		
FW		Digitally signed, Secure boot	Digitally signed, Secure boot
HW tamper	No	Case opening evidence	Case opening evidence
Diagnostics			
Radio link testing	Ping with RSS, MSE (DQ)		
Logs	Status	Status, Event log	Status, Event log
Statistics	Historical and differential statistics (Rx/Tx packets etc.) for all interfaces, for Radio channel in adition RSS, MSE (DQ), Repeats etc.		
Monitoring	Real time analysis of all interfaces (Radio, ETH 1-5 , COM 1-3...)		
NTP	Client / Server		
SNMP	SNMPv1, SNMPv2c, SNMPv3, SNMP Trap / Inform alarms generation as per settings		
Approvals	CE (RED), FCC, … Ask for others		