RADIO AND CELLULAR ROUTER IN ONE

RipEX

Private **Mission-Critical** **Mesh**

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, Oil & Gas and many others.



MARKET LEADER

- 1.7 Mb/s, 256QAM
- Dynamic routing
- mPCIe extension – Cellular, Wi-Fi, GPS...
- Unlimited coverage without Base stations

PERFORMANCE

- 160, 300, 400, 800, 900 MHz
- 2CPFSK – 256QAM, ACM
- 6.25 – 300 kHz channels
- 10 W, Half or Full duplex

RELIABILITY

- Industrial hardened design, −40 to +70 °C
- Each unit tested in climatic chamber
- MTBF > 100 years, Made in Czechia, EU
- Backup routes, 1+1 Redundancy

SECURITY

- IPsec, OpenVPN, AES256
- RADIUS, Firewall, VLAN
- Digitally signed FW, Secure Boot
- HW tamper, IEC 62443-4-2



RACOM

www.racom.eu

TECHNICAL PARAMETERS

	RipEX2	RipEX2e
Max. Speed	1.7 Mb/s @ 256QAM	250 kb/s @ 64QAM
Speed @ 25 kHz	167 kb/s	125 kb/s
ACM	Yes	No
Channel size	6.25 – 300 kHz	6.25 – 50 kHz
Interfaces	4× ETH, 1× SFP, 2× COM, 1× USB	2× ETH, 2× COM, 1× USB
mPCIe	Yes	No
Full-duplex	Yes	No

Radio parameters	**RipEX2**	**RipEX2e**
Frequency bands	135–175; 285–335; 335–400; 400–470; 450–520; 803 – 897; 860 – 960 MHz	
Channel spacing	6.25; 12.5; 25; 50; 100; 150; 200; 250; 300 kHz	6.25; 12.5; 25; 50 kHz
Frequency stability	+/- 0.5 ppm	
Modulations	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)	2/3; 3/4; 5/6; Off	
ACM	Yes (Packet-level adaptation; Independent per radio link; Bidirectional)	No
Gross data rate	up to 1.7 Mb/s	up to 250 kb/s
RF Output power	20-40 dBm PEP (0.1-10 W RMS), 1 dB step programmable	
Duty cycle	Continuous	
Rx to Tx Time	< 0.7 ms @ 25 kHz; < 1 ms @ 12.5 kHz channel	
Sensitivity	- 97 dBm (256QAM; 12.5 kHz; BER 10-6; 2/3 FEC) -117 dBm (2CPFSK; 12.5 kHz BER 10-6; 3/4 FEC)	- 101 dBm (64QAM; 12.5 kHz; BER 10-6; 2/3 FEC) -117 dBm (2CPFSK; 12.5 kHz BER 10-6; 3/4 FEC)
Electrical		
Primary power	10 to 30 VDC, negative GND	
Rx	8.3 W @ 24 V	
Tx	12 – 55 W @ 24 V	
Sleep mode	0.01 W	
Interfaces		
Ethernet	4x 10/100/1000 Base-T Auto MDI/MDIX 4 x RJ45	2x 10/100/1000 Base-T Auto MDI/MDIX 2 x RJ45
SFP	1x 10/100/1000 Base or T/1000Base-SX or 1000Base-LX 1 x SFP	No
Serial	1x RS232/RS485 SW configurable 1 x DB9F 1x RS232 600 b/s – 1 Mb/s	1x RS232/RS485 SW configurable 1 x DB9F 1x RS232 600 b/s – 1 Mb/s
USB	USB 3.0 / Host A	
Antenna	2x TNC female @ 50 ohms SW configurable: 1x Tx/Rx or 1x Rx + 1x Tx	1x TNC female @ 50 ohms, Tx/Rx
Inputs/Outputs	1x HW alarm input, 1x HW alarm output, 1x Sleep input, 2x DI, 2x DO, 1x DiffDI	1x HW alarm input, 1x HW alarm output, 1x Sleep input
Optional Extensions	1x mPCIe: Cellular module, Wi-Fi, GPS...	No
Indication LEDs		
LED panel	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)
Environmental		
IP Code (Ingress Protection)	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	
Mechanical		
Casing	Rugged die-cast aluminium	
Dimensions	60 H x 185 W x 125 D mm (2.34 x 7.2 x 4.9 in)	
Weight	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 (RipEX2e does not support Base station in Base driven)	
Routing (both, Radio and Ethernet)	Static, Dynamic - Babel, OSPF, BGP, Link management	
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	
Data integrity control	CRC32	
Optimization	Intelligent payload data and header (Eth / IP / TCP / UDP) compression	
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)	4 levels (Guest, Tech, SecTech, Admin)	
Encryption	AES256 - CCM	
VPN	IPsec, OpenVPN, GRE	
VLAN	IEEE 802.1Q (tagging), Q-in-Q for Transparent mode	
AAA protocol	RADIUS	
Firewall	Layer 2 - MAC, Layer 3 - IP, Layer 4 - TCP/UDP	
FW	Digitally signed, Secure boot	
HW tamper	Case opening evidence	
Cyber resilience	IEC 62443-4-2	
Diagnostics		
Radio link testing	Ping with RSS, MSE (DQ)	
Logs	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, Cellular...)	
NTP	Client, Server	
SNMP	SNMPv1, SNMPv2c, SNMPv3, SNMP Trap / Inform alarms generation as per settings	
SMS	SMS alarms generation as per settings	
Approvals	CE (RED), FCC, ... Ask for others	

Technical parameters are subject to change without prior notification. For more details see User manuals.