РАДИОМОДЕМ И СОТОВЫЙ МАРШРУТИЗАТОР

RipEX

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

RipEX — это радиомодемная платформа, обеспечивающая круглосуточный надежный сервис беспроводной передачи данных в критически важных системах, таких как SCADA и телеметрия, в критически важной инфраструктуре, такой как инфраструктура энерго- и водоснабжения, нефтегазовых предприятий и многих других.

ЛИДЕРСТВО НА РЫНКЕ

- 1,7 Мбит/с, 256 QAM
- Динамическая маршрутизация
- Расширение mPCIe — сотовая связь, Wi-Fi, GPS...
- Неограниченное покрытие без базовых станций

РАБОТА

- 160, 300, 400, 800, 900 MHz
- 2CPFSK – 256 QAM, ACM
- Каналы 6,25 – 300 кГц
- 10 Вт, полу- или полнодуплексная связь

НАДЕЖНОСТЬ

- Промышленное прочное исполнение, от -40 до +70 °C
- Каждое устройство тестируется в климатической камере
- Среднее время наработки на отказ > 100 лет, сделано в Чехии, ЕС
- Резервная маршрутизация, резервирование 1+1

БЕЗОПАСНОСТЬ

- IPsec, OpenVPN, AES256
- RADIUS, Firewall, VLAN
- Прошивка с цифровой подписью, безопасная загрузка
- Обнаружение взлома оборудования

RACOM

www.racom.eu

ХАРАКТЕРИСТИКИ

	RipEX2	RipEX2e	RipEX
Max. Speed	1.7 Mb/s @ 256QAM	250 kb/s @ 64QAM	166 kb/s @ 16DEQAM
Speed @ 25 kHz	167 kb/s	125 kb/s	83 kb/s
Channel size	6.25 – 300 kHz	6.25 – 50 kHz	6.25 – 50 kHz
Interfaces	4× ETH, 1× SFP, 2× COM, 1× USB	2× ETH, 2× COM, 1× USB	1× ETH, 2× COM, 1× USB
mPCIe	Yes	No	No
Full-duplex	Yes	No	No

Radio parameters	**RipEX2**	**RipEX2e**	**RipEX**
Frequency bands	135–175; 285–335; 335–400; 400–470; 450–520; 803 – 897; 860 – 960 MHz		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; 100; 150; 200; 250; 300 kHz	6.25; 12.5; 25; 50 kHz	6.25; 12.5; 25; 50 kHz
Frequency stability	+/- 0.5 ppm		+/- 1.0 ppm
Modulations	QAM: 256QAM, 64QAM, 16DEQAM, D8PSK, π/4DQPSK, DPSK FSK: 4CPFSK, 2CPFSK	QAM: 64QAM, 16DEQAM, D8PSK, π/4DQPSK, DPSK FSK: 4CPFSK, 2CPFSK	QAM: 16DEQAM, D8PSK, π/4DQPSK, DPSK FSK: 4CPFSK, 2CPFSK
FEC (Forward Error Correction)	2/3; 3/4; 5/6; Off		3/4; Off
Gross data rate	up to 1.7 Mb/s	up to 250 kb/s	up to 167 kb/s
RF Output power	20-40 dBm PEP (0.1-10 W RMS), 1 dB step programmable		20-40 dBm PEP (0.1-10 W RMS), 9 levels programmable
Duty cycle	Continuous		
Rx to Tx Time	< 0.7 ms @ 25 kHz; < 1 ms @ 12.5 kHz channel		< 1.5 ms
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)	- 99 dBm (16DEQAM; 12.5 kHz; BER 10-6; 3/4 FEC) -111 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		4.8 W @ 24 V
Tx	12 – 55 W @ 24 V		13 – 38 W @ 24 V
Sleep mode	0.01 W		0.1 W
Interfaces			
Ethernet	4x 10/100/1000 Base-T Auto MDI/MDIX 4x RJ45	2x 10/100/1000 Base-T Auto MDI/MDIX 2x RJ45	1x 10/100 Base-T Auto MDI/MDIX 1x RJ45
SFP	1x 10/100/1000 Base or T/1000Base-SX or 1000Base-LX 1x SFP	No	No
Serial	1x RS232/RS485 SW configurable 1x DB9F 1x RS232 600 b/s – 1 Mb/s	1x RS232/RS485 SW configurable 1x DB9F 1x RS232 600 b/s – 1 Mb/s	1x RS232 1x DB9F 1x RS232/RS485 SW configurable 1x DB9F 300 b/s – 115 kb/s
USB	USB 3.0 / Host A		USB 1.1 / 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	1x TNC female @ 50 ohms (Tx/Rx) or 2x TNC (1x Rx + 1x Tx) - different HW model
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	1x HW alarm input, 1x HW alarm output, 1x Sleep input
Optional Extensions	1x mPCIe: Cellular module, Wi-Fi, GPS…	No	GPS
Indication LEDs			
LED panel	5x tri-color status LEDs (SYS, AUX, RX, TX, COM)		7x tri-color status LEDs (Power, ETH, COM1, COM2, Rx, Tx, Status)
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		IP40, IP51
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)		50 H x 150 W x 118 D mm (1.97 x 5.9 x 4.65 in)
Weight	1.55 kg (3.4 lbs)		1.1 kg (2.4 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)		Transparent @ Bridge; Flexible, Base driven @ Router
Routing (both, Radio and Ethernet)	Static, Dynamic - Babel, OSPF, BGP, Link management		Static, Nomadic, Backup routes
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)		2 levels (Guest, Admin)
Encryption	AES256 - CCM		
VPN	IPsec, OpenVPN, GRE		
VLAN	IEEE 802.1Q (tagging), Q-in-Q for Transparent mode		
AAA protocol	RADIUS		No
Firewall	Layer 2 - MAC, Layer 3 - IP, Layer 4 - TCP/UDP		
FW	Digitally signed, Secure boot		
HW tamper	Case opening evidence		No
Diagnostics			
Radio link testing	Ping with RSS, MSE (DQ)		
Logs	Status, Event log		Status
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	No	No
Approvals	CE (RED), FCC, … Ask for others		

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