Unique Microwave links

RAy

80 GHz

RAy3-80 is a member of high-speed p-t-p microwave link platform for the most challenging conditions. The design is based on a concept proven for a long time in the 10, 17, 18 and 24 GHz bands, but there is a substantial increase of speed from 1 Gb/s to 10 Gb/s.

Market leader

- Solar ready 35 – 45 W
- Compact size, Light weight 2.8 kg
- 1× ETH, 1× SFP+, PoE, DC
- Wifi management, Mobile App

Performance

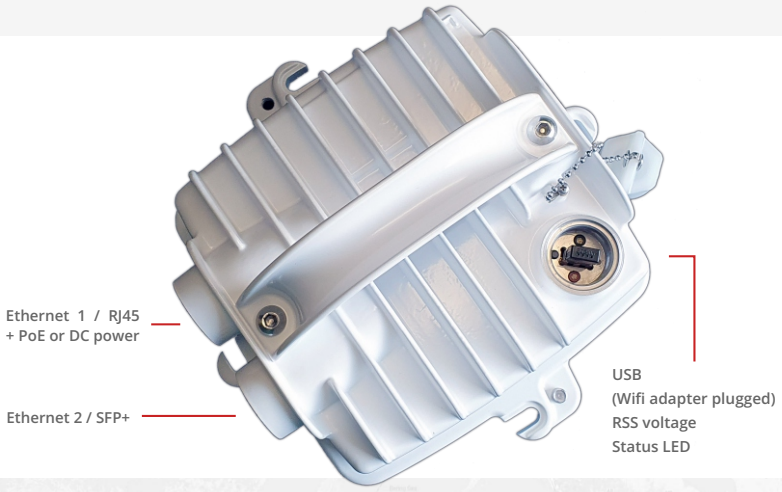
- 10 Gb/s FDD
- 62 MHz – 2 GHz channels
- 2PSK – 256QAM
- -6 to +20 dBm

Spectral efficiency

- Flexible duplex spacing
- Many channel options
- Built-in spectrum analyzer
- Optimal bandwidth usage

Reliability

- High sensitivity, Hitless ACMB and ATPC
- Surge immunity 4 kV, ESD 8 kV
- Each unit tested in climatic chamber
- MTBF > 100 years, Made in Czechia, EU



RACOM

www.racom.eu

Technical parameters

Radio parameters	**RAy3-80**		
Frequency range	71 – 86 GHz (E-band)		
	Lower (unit L) 71.000 – 76.000 GHz	Upper (unit U) 81.000 – 86.000 GHz	
Type of duplex traffic	FDD (Frequency division duplex)		
Speed (each direction)	up to 10 Gb/s		
Channel bandwidth	250, 500, 750, 1000, 1250, 1500, 1750, 2000 MHz (62.5 and 125 MHz only available for ACMB)		
Duplex spacing	flexible; typ 10 GHz, min 5 GHz, max 15 GHz		
Modulations	2PSK, 4PSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM		
ACMB	Hitless - including bandwidth reduction to 1/2 or 1/4 and stronger FEC (together with RF Output power regulation increases the system gain by up to 35.5 dB)		
FEC	LDPC		
Sensitivity, BER 10^{-6}	-85 dBm (25 Mb/s) -76 dBm (200 Mb/s)	-68 dBm (1 Gb/s) -59 dBm (4 Gb/s)	-53 dBm (7 Gb/s) -46.5 dBm (10 Gb/s)
RF Output power	-6 to +20 dBm (+17 dBm @ 32QAM; +16 dBm @ 64QAM; +14 dBm @ 128QAM; +13 dBm @ 256QAM)		
ATPC	Yes (range 26 dB)		

Range with different antennas			
Speed	**1 Gb/s**	**4 Gb/s**	**10 Gb/s**
Availability	**99.95% / 99.99%**	**99.95% / 99.99%**	**99.95% / 99.99%**
Antenna 38 - 40 cm (47 dBi)	7.8 km / 3.8 km	5.9 km / 2.9 km	2.5 km / 1.3 km
Antenna 65 - 68 cm (51 dBi)	10.0 km / 4.7 km	7.9 km / 3.4 km	3.8 km / 1.9 km

Ethernet (user data & management)	
RJ45	1 Gb Eth. 10/100/1000BASE-T Auto MDI/MDIX
SFP (user exchangeable)	10 Gb Eth. SFP+ slot for 1000/2500/5000/10000 BASE-T; 1000/10000 BASE-SX; 1000/10000 BASE-LX (power max. 3 W)
Throughput L1 (RFC 2544)	10000 Mb/s (64-128 B frames); 9512 Mb/s (1518 B frames)
Latency L1 @ 10 Gb/s (RFC 2544, one way)	12.9 µs (64 B frames); 23.5 µs (1518 B frames)
MTU (max packet length)	10240 Bytes
Synchronization	Synchronous Ethernet; PTP (transparent for IEEE-1588v2)

Electrical	
Primary power	PoE active IEEE 802.3bt (POE++); PoE passive 37– 60 VDC; DC 37 – 60 VDC; floating
Power consumption (typ.)	35 W @ channel ≤ 500 MHz; 37 W @ 1000 MHz; 42 W @ 2000 MHz; max 45 W (with SFP+)

System interfaces	
USB	USB 2.0, Host A; USB / WiFi; USB / ETH
RSS voltage	Two contact sockets
Indication LED	System status (multicolor)
System button	Default settings, Configuration restore from internal backup

Environmental	
Ingress Protection	IP66
MTBF (Mean Time Between Failure)	> 1 000 000 hours (> 114 years) projected
Operating temperature	- 30 to + 55°C (ETSI EN 300019-1-4, class 4.1.)
Operating humidity	5 to 95% non-condensing
Surge immunity	4 kV (EN 61000-4-5)
ESD resistance	8 kV (EN 61000-4-2)

Mechanical	
Design & Mounting	FOD (Full Outdoor), direct mounting to antenna
Unit types	Specific units for Lower (L) and Upper (U) part of the band
Casing	Rugged die-cast aluminium
Size	H×W×D: 160×245×245 mm (6.3×9.6×9.6 in)
Weight	2.8 kg (6.1 lbs)

Diagnostics & Monitoring	
Real time monitoring	RSS, MSE, BER
Diagnostic tools	Spectrum analyzer, Pinger
History charts	Temperature, Power voltage, RSS, MSE, BER, Data rate, RF Output power
Statistics	RMON counters for all interfaces
Antenna alignment	RSS voltage, Smartphone app (RAyTools), Web
SNMP	SNMP v2c including configurable TRAPs

Security	
Management	Web (HTTP, HTTPS), CLI (SSH, Telnet), Smartphone app (RAyTools)
Access accounts	3 levels (Guest, Admin, Super)
WiFi	Passphrase; HW/SW enable/disable; active only during air-link loss

Standards	
Approvals	CE (RED), FCC*, IC*

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