

Faisceaux Hertziens Uniques

RAY

Les RAY sont des faisceaux hertziens offrant des liaisons Point-à-Point très haut débit, y compris dans des conditions difficiles. Ils sont utilisés par les opérateurs et par les Fournisseurs d'Accès Internet à la fois pour les backbones et pour les liaisons du dernier kilomètre.



Leader du Marché

- Fiabilité exceptionnelle sur une longue portée
- Meilleure efficacité spectrale
- Consommation électrique optimale
- Management via Wifi et application mobile

Performance

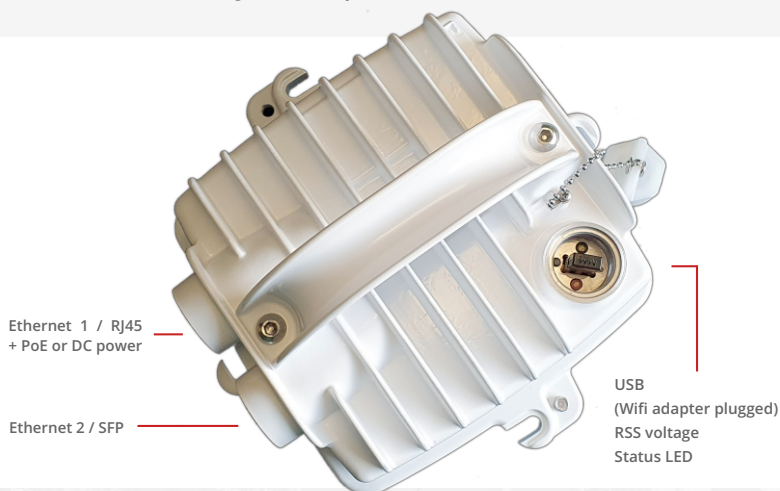
- 1 Gb/s FDD
- Canaux de 3,5 à 112Mhz
- QPSK - 4096 QAM
- 10, 17, 18 et 24 Ghz

Efficacité spectrale

- Utilisation optimale de chaque part du spectre disponible
- Analyseur de spectre intégré
- Parfait pour les sites perturbés
- Canaux asymétriques et bandes étroites

Fiabilité

- Résistance à toutes interférences
- Haute sensibilité, Hitless ACM (Modulation Adaptative)
- Ajustement Automatique de la puissance (ATPC)
- Protection surtensions 4kV, ESD 8kV
- Test unitaire en étuve



Spécifications Techniques

Radio parameters	17 GHz / 24 GHz			18 GHz	
	The same HW for L/U			Lower	Upper
Sub-band A	no sub-bands			17.700 – 18.209	18.710 – 19.219
Sub-band B	17.10 – 17.30 GHz			18.167 – 18.690	19.177 – 19.700
Sub-band C	24.00 – 24.25 GHz			17.700 – 18.300	19.300 – 19.700
Channel spacing	3.5, 5, 7, 10, 14, 20, 28, 40, 56, 80, 100, 112 MHz			5, 7, 7.5, 10, 13.75, 20, 27.5, 30, 40, 50, 55, 60, 80, 100, 110 MHz	
Channel duplex spacing	Flexible location adjusted by SW, min. 18 MHz between channel edges			1008, 1010 MHz @ Sub-band A, B 1560 MHz @ Sub-band C	
Gross data rate	2.7 – 1002 Mb/s			4.2 – 1010 Mb/s	
FEC	LDPC, RS				
Speed / Sensitivity					
Modulation	3.5 MHz	56 MHz	112 MHz	5 MHz	110 MHz
QPSK_S	2.7 Mb/s @ -99.0 dBm	48 Mb/s @ -88.0 dBm	97 Mb/s @ -85.0 dBm	4.2 Mb/s @ -99.0 dBm	96 Mb/s @ -85.0 dBm
QPSK	5.0 Mb/s @ -94.5 dBm	81 Mb/s @ -84.5 dBm	161 Mb/s @ -81.5 dBm	7.2 Mb/s @ -95.0 dBm	166 Mb/s @ -81.0 dBm
16 QAM	9.5 Mb/s @ -88.5 dBm	168 Mb/s @ -77.5 dBm	334 Mb/s @ -74.5 dBm	12 Mb/s @ -90.5 dBm	287 Mb/s @ -76.0 dBm
32 QAM	11 Mb/s @ -85.0 dBm	213 Mb/s @ -73.5 dBm	426 Mb/s @ -70.5 dBm	17 Mb/s @ -85.5 dBm	400 Mb/s @ -71.0 dBm
64 QAM	15 Mb/s @ -82.0 dBm	267 Mb/s @ -70.5 dBm	536 Mb/s @ -67.5 dBm	22 Mb/s @ -82.5 dBm	513 Mb/s @ -68.5 dBm
128 QAM	17 Mb/s @ -79.0 dBm	319 Mb/s @ -67.5 dBm	636 Mb/s @ -64.5 dBm	26 Mb/s @ -80.0 dBm	604 Mb/s @ -65.5 dBm
256 QAM	19 Mb/s @ -76.0 dBm	366 Mb/s @ -64.5 dBm	730 Mb/s @ -61.5 dBm	30 Mb/s @ -77.0 dBm	698 Mb/s @ -62.5 dBm
512 QAM	22 Mb/s @ -73.0 dBm	413 Mb/s @ -61.5 dBm	823 Mb/s @ -58.5 dBm	34 Mb/s @ -74.0 dBm	791 Mb/s @ -59.5 dBm
1024 QAM	23 Mb/s @ -69.5 dBm	459 Mb/s @ -58.5 dBm	918 Mb/s @ -55.5 dBm	38 Mb/s @ -70.5 dBm	881 Mb/s @ -56.0 dBm
2048 QAM (7 - 112 MHz)	-	501 Mb/s @ -55.5 dBm	1002 Mb/s @ -52.5 dBm	42 Mb/s @ -67.0 dBm	958 Mb/s @ -52.0 dBm
4096 QAM (14 - 56 MHz)	-	540 Mb/s @ -52.5 dBm	-	-	1010 Mb/s @ -48.0 dBm
ACM	Hitless				
RF Output power	-30 to +10 dBm			-1 to +23 dBm valid for all modulations and channels	
ATPC	Yes				
MTU	10240 B				
Latency (RFC 2544)	268 µs (64B/366 Mb/s); 313 µs (1518 B/366 Mb/s) 173 µs (64B/1002 Mb/s); 198 µs (1518 B/1002 Mb/s)			<150 µs (66 B, 352 Mb/s); <200 µs (1518 B, 352 Mb/s) <100 µs (66 B, 1010 Mb/s); <150 µs (1518 B, 1010 Mb/s)	
Synchronization	Synchronous Ethernet; 1588v2 transparent clock				
Electrical					
Primary power	PoE active 37 – 60 VDC, IEEE 802.3at; PoE passive 20 – 60 VDC; DC 20 – 60 VDC; floating			PoE active 37 – 60 VDC, IEEE 802.3 bt; PoE passive 37 – 60 VDC; DC 37 – 60 VDC; floating	
Power consumption	Typ. 22.5 W (w/o SFP)			Typ. 30 W for Tx < +17 dBm (w/o SFP); 33 W for Tx >= +17 dBm (w/o SFP)	
Interfaces					
Ethernet	1x 10/100/1000 Base-T Auto MDI/MDIX / RJ45				
SFP	1x 10/100/1000 Base-T/1000Base-SX/1000Base-LX (power max. 1.25 W)				
USB	USB 2.0 / Host A				
RSS voltage	Two contact sockets				
Indication LED	SYS				
Environmental					
IP Code (Ingress Protection)	IP66				
MTBF (Mean Time Between Failure)	> 1.000.000 hours (> 114 years)				
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 acc. EN 61000-4-5				
ESD resistance	8 kV acc. EN 61000-4-2				
Mechanical					
Casing	Rugged die-cast aluminium				
Size	160 H x 245 W x 245 D mm (6.3 x 9.6 x 9.6 in)				
Weight	2.6 kg (5.7 lbs)				
Mounting	FOD, direct mounting to antenna				
Diagnostic					
Real time monitoring	RSS, MSE, BER				
Diagnostic tools	Spectrum analyzer, Pinger, Constellation diagram, Radio loopback				
History charts	Temperature, Power voltage, RSS, MSE, BER, Data rate, RF Output power				
Statistics	RMON counters for all interfaces				
Antenna alignment	RSS voltage, RAY Tools Mobile App, Web				
SNMP	v2c including configurable TRAPS				
Security					
Management	HTTP, HTTPS, SSH, Telnet, RAY Tools Mobile App				
Access accounts	3 levels (Guest, Admin, Super)				
Encryption	AES256, 192, 128				
Standards					
Approvals	17 GHz CE (RED), RoHS 24 GHz CE (RED), FCC, RoHS			CE (RED), FCC 10, RoHS	

Les données techniques sont sujettes à modification sans notification préalable. Pour plus d'informations consultez le [manuel utilisateur](#).

