Y-PACKET

Y-PACKET is the high capacity Full-Ethernet point-to-point microwave radio, realized to meet the requirements of WISP, ISP and Corporate markets. Conceived with full-outdoor approach, it covers frequency range from 6 GHz to 38 GHz, in both Licensed & Unlicensed (17 GHz and 24 GHz) bands. Y-Packet has been developed with an aim to be easy to install and interoperable with other equipment. Y-Packet is available in two variants:

▸ Y-PACKET C (COPPER): PoE PORT ONLY
▸ Y-PACKET F (FIBRE): PoE & OPTICAL SFP PORTS (INCLUDES A DC POWER CONNECTOR)

Radio, Modem and System Types

Y-Packet implements state-of-the-art technologies, such as XPIC jointly with Radio Link Aggregation and Adaptive Modulation. It provides capacity up to 840 Mbps at 56 MHz bandwidth and 1024 QAM. Y-Packet can be configured as 1+1 HSB for link protection, XPIC with Radio Link Aggregation or Repeater. All system configurations are fully outdoor, meaning no requirement of any indoor unit.

Easy and Intuitive web interface

Y-Packet provides intuitive Web Management Interface based on AJAX technology. It supports both IPv4 and IPv6 stacks, for connection over HTTP/HTTPS and SNMP protocols. Y-Packet (F variant only) also supports Double IPv4 stack feature, where two independent IP stacks can be used for Primary and Secondary Management. When enabled, the Secondary management configures the PoE port to be used for management purposes only, providing local out-of-band connection.

Full-Ethernet Solution

In terms of Ethernet protocols and processing, Y-Packet provides support for VLAN 802.1Q (Access, Trunk and Transparent mode) on all Ethernet ports. For optimal performance over the Radio interface, QoS can be configured to classify data and management traffic according to two basic classifiers: IEEE 802.1p or IPv4 DSCP. Y-Packet output scheduler can operate either in WRR or Strict Priority fashion. The queues in the WRR are emptied in a round-robin fashion, and have fixed weights of 8,4,2,1. Y-Packet Ethernet also features Ingress Rate Limiter on all Ethernet ports, Flow Control IEEE 802.3x, Jumbo frames up to 9700 bytes and a configurable buffer for long fibre distances on SFP port.

Power Consumption

Thanks to digital pre-distorter, Y-Packet can enhance Tx power, thus allowing coverage of longer distances. Y-Packet implements ATPC, ensuring maximum level of modulation, i.e. highest throughput, and lowest Tx power at the same time. The typical power consumption is less than 35 W.

Secure Access

Y-Packet can be managed over secure protocols, like HTTPS and SSH. For web access over HTTP/HTTPS, and also for SNMP, up to 6 Access Lists can be independently configured. Firewalling is also possible, for SSH and ICMP. User authentication and authorization can be done on local database or alternatively against a centralized remote RADIUS server.

System Types

Supported System Types 1+0, 1+1 HSB, XPIC, Repeater, Radio Link Aggregation. XPIC can be used in conjunction with the Radio Link Aggregation to double radio capacity.

1+0
416 Mbps
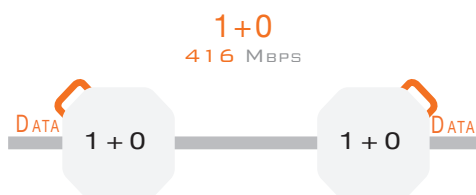
The 1+0 unprotected is the simplest configuration. It comes in two versions: PoE only and PoE+SFP. The latter comes with an additional optical interface suitable for long distances and interference free installations.
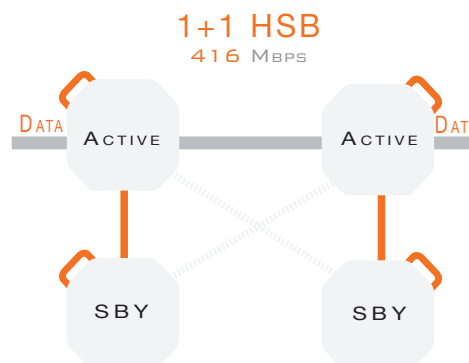
1+1 HSB
416 Mbps

In 1+1 HSB, only the Active transmitting unit is switched on. Upon failure on this unit, the Stand-by takes over, switching on its own transmitter, enabling data to flow through the protection branch.

XPIC
416 Mbps per channel
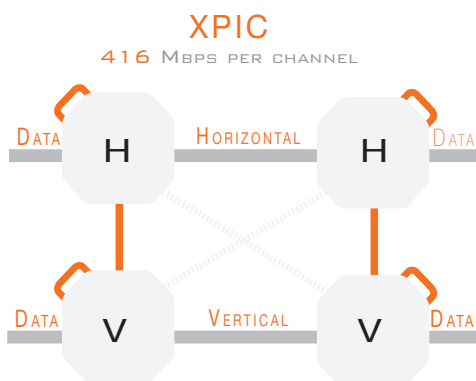
The XPIC system allows to double radio spectrum efficiency. Opposite polarized signals are cancelled out at receiver side. The two channels H and V are independent, reaching a maximum of 416 Mbps each. The best utilization of XPIC is in combination with the Radio Link Aggregation.

Radio Link Aggregation
820 Mbps
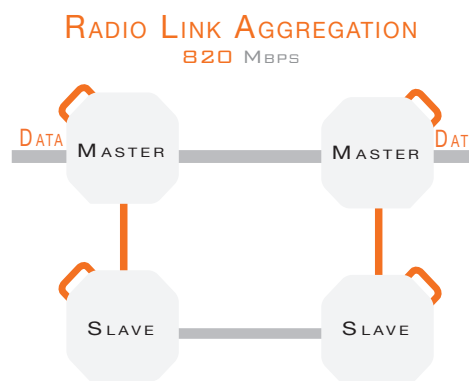
Radio Link Aggregation is a mechanism that doubles radio capacity aggregating two radio channels. The master unit splits incoming data traffic proportionally over the master and slave modulation schemes. The two radio channels can be either provided by XPIC or 2*(1+0) systems.

Quality of Service & Flow Control

Classifiers	IEEE 802.1p & IPv4 DSCP
Policer	Hard Policer in Steps of 2 Mbps
Number of Queues	4
Scheduler	WRR & Strict Priority
Flow Control	IEEE 802.1x

Ethernet & Timing

VLAN Mode	Transparent, Access & Trunk
Frame size	64÷9700 Byte
Learning Mode	Independent VLAN Learning
SyncE Mode	Transparent
Timing	Up to 5 NTP Servers

Management & GUI

GUI	AJAX Web Based
Application Protocols	HTTP, HTTPS, SSH & SNMPv2
Network Protocols	IPv4 & IPV6
Tagging on Management	C-TAG & S-TAG
SNMP Trap Receivers	10
Logs	Detailed Activity History

Security

User Classes	Admin, Read-Write & Read-Only
Firewall	On SSH and ICMP
Access Lists	IP Based on HTTP, HTTPS & SNMP
User Authentication	Local or RADIUS

Sensitivity[‡] [dBm] Vs Frequency Band, Bandwidth & Modulation

		6L/U GHz	7 GHz	8 GHz	10.5 GHz	11 GHz	13 GHz	15 GHz	17 GHz	18 GHz	23 GHz	24 GHz	32 GHz	38 GHz
7 MHz	4 QAM	-88	-88	-88	-88	-88	-88	-88	-88	-88	-87.5	-87.5	-88	-88
	16 QAM	-83	-83	-83	-83	-83	-82	-82	-82	-82	-81.5	-81.5	-81	-81
	32 QAM	-81	-81	-81	-81	-81	-79	-79	-79	-79	-78.5	-78.5	-78	-78
	64 QAM	-77	-77	-77	-77	-77	-76	-76	-76	-76	-75.5	-75.5	-74.5	-74.5
	128 QAM	-73	-73	-73	-73	-73	-73	-73	-73	-73	-72.5	-72.5	-71	-71
14 MHz	4 QAM	-88	-88	-88	-88	-88	-87	-85.5	-85.5	-85.5	-85	-85	-85	-85
	16 QAM	-81	-81	-81	-81	-81	-81	-79.5	-79.5	-79.5	-79	-79	-78	-78
	32 QAM	-78	-78	-78	-78	-78	-77	-76.5	-76.5	-76.5	-76	-76	-75	-75
	64 QAM	-74	-74	-74	-74	-74	-74	-73.5	-73.5	-73.5	-73	-73	-72	-72
	128 QAM	-72	-72	-72	-72	-72	-71	-70.5	-70.5	-70-5	-70	-70	-69	-69
	256 QAM	-66	-66	-66	-66	-66	-67	-67.5	-67.5	-67.5	-67	-67	-65.5	-65.5
28 MHz	4 QAM	-87	-85	-85	-84	-84	-85.5	-82.5	-82.5	-82.5	-82	-82	-83	-83
	16 QAM	-79	-78.5	-78.5	-78	-78	-77.5	-76.5	-76.5	-76.5	-76	-76	-76	-76
	32 QAM	-76	-75	-75	-74.5	-74.5	-74	-73.5	-73.5	-73.5	-73	-73	-73	-73
	64 QAM	-72	-72	-72	-71.5	-71.5	-71	-70.5	-70.5	-70.5	-70	-70	-70	-70
	128 QAM	-69	-69	-69	-68	-68	-67.5	-67.5	-67.5	-67.5	-67	-67	-66	-66
	256 QAM	-65.5	-65	-65	-65	-65	-64.5	-64.5	-64.5	-64.5	-64	-64	-63	-63
	512 QAM	-61	-61	-61	-61	-61	-60.5	-60.5	-60.5	-60.5	-58	-58	-59	-59
	1024 QAM	-59	-59	-59	-59	-59	-58.5	-58.5	-58.5	-58.5	-56	-56	-56	-56
56 MHz	4 QAM	-83.5	-83.5	-83.5	-83	-83	-82.5	-79.5	-79.5	-79.5	-79	-79	-80	-80
	16 QAM	-76	-75.5	-75.5	-75	-75	-74.5	-73.5	-73.5	-73.5	-73	-73	-73	-73
	32 QAM	-73	-72	-72	-71.5	-71.5	-71	-70.5	-70.5	-70.5	-70	-70	-70	-70
	64 QAM	-69	-69	-69	-68.5	-68.5	-68	-67.5	-67.5	-67.5	-67	-67	-67	-67
	128 QAM	-66	-65.5	-65.5	-65	-65	-64.5	-64.5	-64.5	-64.5	-64	-64	-64	-64
	256 QAM	-62.5	-62.5	-62.5	-62	-62	-61.5	-61.5	-61.5	-61.5	-61	-61	-61	-61
	512 QAM	-59.5	-58.5	-58.5	-58	-58	-57.5	-58.5	-58.5	-58.5	-58	-58	-58	-58
	1024 QAM	-56	-56	-56	-57	-57	-56.5	-56.5	-55.5	-55.5	-52.5	-52.5	-54	-54

17 GHz: UNLICENSED   24 GHz: UNLICENSED

[‡] @ Antenna port & BER=10^{-6}

Maximum Output Power[‡] [dBm] Vs Frequency Band & Modulation

	6L/U GHz	7 GHz	8 GHz	10.5 GHz	11 GHz	13 GHz	15 GHz	17 GHz	18 GHz	23 GHz	24 GHz	32 GHz	38 GHz
4 QAM	26	26	26	26	26	25	25	15	24	23	15	22	22
16 QAM	23	23	23	23	23	22	22	15	21	20	15	19	19
32 QAM	23	23	23	23	23	22	22	15	21	19	15	19	19
64 QAM	22	22	22	22	22	21	21	15	20	17	15	18	18
128 QAM	21	21	21	21	21	20	20	15	19	16	15	18	18
256 QAM	21	21	21	21	21	20	20	15	19	15	15	17	17
512 QAM	20	20	20	20	20	19	19	15	18	14	15	16	16
1024 QAM	20	20	20	20	20	19	19	15	18	13	15	16	16
ATPC Range	0÷26	0÷26	0÷26	0÷26	0÷26	0÷25	0÷25	-25÷15[‡‡]	0÷24	0÷23	-25÷15[‡‡]	0÷22	0÷22

17 GHz: UNLICENSED   24 GHz: UNLICENSED

[‡] @ Antenna port

[‡‡] Available in Q1 2015

Frequency Bands, Modulations & Capacity

Frequency Bands	Licensed	6L, 6U, 7, 8, 10.5, 11, 13, 15, 18, 23, 32, 38 GHz
	Unlicensed	17, 24 GHz
Modulations	Manual Mode	4, 16, 32, 64, 128, 256, 512, 1024 QAM
	Adaptive Mode	4, 16, 64, 256, 1024 QAM
Channel Bandwidths		7, 14, 28, 40[‡], 56 MHz
Capacity	L1 Gross bit rate	Up to 500 Mbps & up to 1 Gbps in Radio Link aggregation Configuration
	Ethernet L2 Throughput	Up to 416[‡‡] Mbps & up to 820[‡‡] Mbps in Radio Link Aggregation Configuration

[‡] 40 MHz Bandwidth available for 6L/U and 11 GHz
[‡‡] Throughput measured with frame size of 1518 Byte

Ports & Connectors

		Y-PACKET C	Y-PACKET F
Data & Management	1 PoE RJ45 GE	Y	Y
	1 SFP GE Optical	N	Y
ODU-ODU Connection	1 RJ45	Y	Y
Direct Power Feed	-48 V DC Bipolar	N	Y
RSSI	Female BNC	Y	Y
Antenna Port	6÷38 GHz	Standard IEC rectangular/square waveguide	
Antenna Mounting	Integrated (Standard)	Proprietary mount for antenna diametrrs 0.3 to 1.8 m (max 0.2 m for 24 GHz, max 0.3 m for 17 GHz)	
	Non-Integrated (Optional)	Remote mount via flexi/elliptical/rectangular waveguide	

RF Specifications

Transmitter/Receiver source	Synthetized
Frequency Stability	± 10 ppm
Transmitter Mute	<-50 dBm
Synthetizer Resolution	0.25 MHz
XPD Improvement	20 dB
RX Max Input Level	-10 dBm
Residual (Background) Bit Error Rate	$< 10^{-12}$
RSSI Accuracy (Measured at BNC port)	± 3 dB

Electrical & Mechanical

Power Consumption (Max/Typical)	35/32.5 W
Size	273 x 273 x 91.7 mm^3 (for Y-Packet C)
	273 x 273 x 113.9 mm^3 (for Y-Packet F)
Weight	5÷8[‡] kg

[‡] Weight depends on Frequency Band and variant C or F

Environmental

Operating Temperature (Still Air)	Guaranteed	-33 ÷ +55 °C
	Extended[‡]	-50 ÷ +55 °C
Humidity		100%
Altitude		5000 m

[‡] Applicable to Y-Packet "Ice" and application of solar shield

Standard Compliance

EMI/EMC	ENI 301 489-1 and ENI 301 489-4, Class B Emissions
Operation	EN 300 019-2-4, Class 4.1
Tranportation/Storage	EN 300 019-1-2, Class 2.3 / EN 300 019-1-1, Class 1.2
Safety	EN 60950-1, EN 60950-22, IEC 60950-1, IEC 60950-22
RF Performances	EN 302 217 Parts 1, 2-1, 2-2, EN300-400
Protection Degree	IP65, IEC 60529
Lightning Protection	Surge 5 kV – 10/700 µs ITU-T k.45 for Ethernet Port
RoHS	According to 2002/95/EC

youncta
MICRAN COMPANY