HYC-ENA-MIMO
PTP/PTMP Series

HYC-N1051C/T

HYC-N2051C/T-27

HYC-N2052C/T-27

HYC-N1000 / 2000 Series

Multi-MIMO HT-OFDM Outdoor Radio
4x4 MIMO supports Multi-hops repeat
4x4 MIMO supports TDMA Redundancy

Multi-Hops Repeater in e-Rake MIMO PTP/PTMP Series offers customers a great solution for PTP / PTMP / Hot zone applications by integrated multi-radios interfaces and Fast Data Switching technology from Hypercable.This series shows incredible efficiency on multi-hops repeating – truly throughput ≧170Mbps and only ≦ 35 ms total latency after 20 extended hops. Much different from the traditional Wi-fi that dropped 50% throughput per each extended hop and can't get reply from remote device after 5~6 hops for too long latency.

There are 14 channels bandwidth options can be selected easily by software (2.5 / 3 / 3.5 / 4 / 5 / 6 / 7 / 8 / 10 / 15 / 20 / 30 / 40 / 52 MHz). This feature provides the flexibility of deployment channel plan in crowded city area or high capacity backhaul -- throughput up to 268Mbps.

With MIMO HT-OFDM (High Throughput OFDM) technology, this radio is a high capacity PTP / PTMP backhaul for 5GHz ISM band wireless deployment. It utilizes coordinate and built-in NMS with internet map database to show the environment and status of the link. Customers can easily figure out the linking situation of the deployed radios.

Features:

- PTP/ PTMP Ethernet backhaul
- 4.920~6.075 GHz Operating Frequency
- MIMO HT-OFDM Modulation
- Integrated Multi-Radio Interfaces
- ±2 ppm Frequency Stability for Mobility & NLOS
- Fast Data Switching Technology
- 14 Channel BW (2.5 / 3 / 3.5 / 4 / 5 / 6 / 7 / 8 / 10 / 15 / 20 / 30 / 40 / 52 MHz)
- Up to 268 Mbps Real TCP Throughput
- GPS Coordinates and Internet map database
- 5.2 bits/s/Hz amazing spectral efficiency
- Multi-hops repeating & Built-in NMS
- Real Aggregate TCP Throughput ≧ 320Mbps @ 4x4 Base Station
- High Efficiency in Multi-hops Repeating
  - Low Throughput dropped @ 40MHz Ch BW (≧170 Mbps @ 20 hops)
  - Short Latency increased @ 40MHz Ch BW (≦35 ms @ 20 hops)
- IP-68 Water & Dust Resistant
- IEC61000-4-5 Surge Protection
- Outstanding MTBF

Product Highlights

- **Integrated Multi-radios interfaces on Athena-MIMO platform.**
  Multiple radios interfaces were integrated by "Fast Data Switching" technology from HYC inside the Mesh-MIMO series platform. There are 3 type of radios for options: HYC-N1051C / HYC-N2051C (1*radio) / HYC-N2052C (2*radios) / HYC-N2053C (3*radios) and each radio interface can be configured independently to run different wireless connectivity missions.
- **High efficiency transmission in multi-hops repeating (Ex: @ 40MHz Ch BW)**
  The backbone throughput will remain in a high level even after several hops repeating. (≧ 170 Mbps @ 20 hops), and the total latency is short as well (≦35 ms @ 20 hops).
- **Effective spectrum utility/variable capacities with 14 channel Bandwidths**
  This radio has **14 channels bandwidth (2.5 / 3 / 3.5 / 4 / 5 / 6 / 7 / 8 / 10 / 15 / 20 / 30 / 40 / 52 MHz)** for optional, which is adjustable via software. This function provides flexibilities of channel plan in crowded urban environment and variable capacities for different applications.
- **MIMO HT-OFDM technology provides amazing spectral efficiency**
  Up to **5.2 bits/s/Hz** amazing spectral efficiency for all channel bandwidth provided by the MIMO HT-OFDM technology. Work with the variable channel bandwidth options, these two combination features provides great benefits for both crowded urban area and rural area with less interference.
  - TCP throughput at different channel BW

Channel BW (MHz)	2.5	3	3.5	4	5	6	7	8	10	15	20	30	40	52
Real TCP throughput (Mbps)	12	14	17	20	25	30	35	40	51	77	104	158	215	268
Application area	Valuable spectrum				Crowded urban						Rural			

Specifications

RADIO SPECIFICATIONS	
Frequency range	4.920 ~ 6.075 GHz Optional
Channel Band Width	2.5 / 3 / 3.5 / 4 / 5 / 6 / 7 / 8 / 10 / 15 / 20 / 30 / 40 / 52 MHz
Frequency Stability	± 2 ppm
Modulation	MIMO HT-OFDM

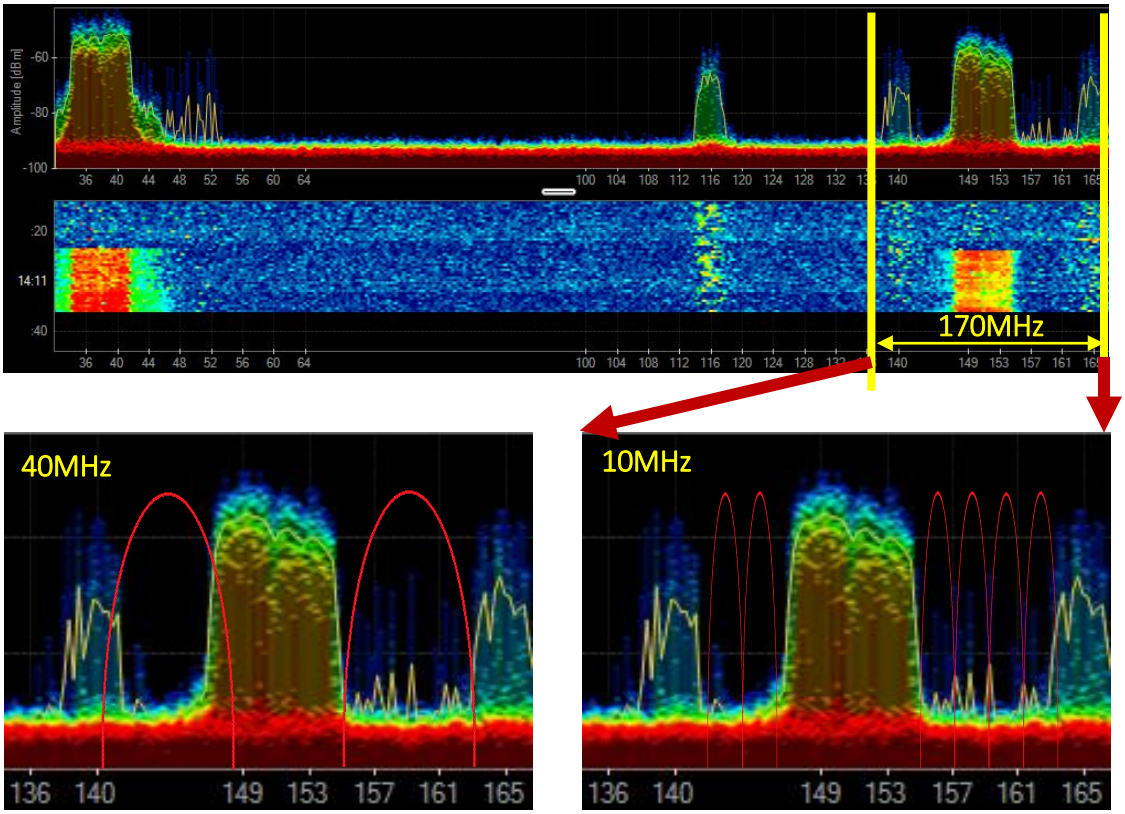
MCS Index	MIMO-OFDM / HT20				MIMO-OFDM / HT40			
	Data Rate (Mbps)		Tx Output Power (dBm)	Rx Sensitivity (BER $1^{E}10$-6)	Data Rate (Mbps)		Tx Output Power (dBm)	Rx Sensitivity (BER $1^{E}10$-6)
	GI=800ns	GI=400ns			GI=800ns	GI=400ns		
MCS8	6.5/13	N/A	27(±1.5)	-94/-92 dBm	13.5/27	15/30	27(±1.5)	-92/-90 dBm
MCS9	13/26	N/A	26(±1.5)	-92/-90 dBm	27/54	30/60	26(±1.5)	-89/-87 dBm
MCS10	19.5/39	N/A	26(±1.5)	-90/-87 dBm	40.5/81	45/90	26(±1.5)	-87/-83 dBm
MCS11	26/52	N/A	25(±1.5)	-87/-84 dBm	54/108	60/120	25(±1.5)	-84/-81 dBm
MCS12	39/78	N/A	24(±1.5)	-84/-81 dBm	81/162	90/180	24(±1.5)	-81/-79 dBm
MCS13	52/104	N/A	23(±1.5)	-80/-77 dBm	108/216	120/240	23(±1.5)	-78/-75 dBm
MCS14	58.5/117	N/A	23(±1.5)	-78/-75 dBm	121/242	135/270	23(±1.5)	-76/-73 dBm
MCS15	65/130	N/A	23(±1.5)	-76/-73 dBm	135/270	150/300	23(±1.5)	-74/-72 dBm

INTERFACES	
Wireless Interface : 2 x N-type Female Connectors / 4 x N-type Female Connectors / 6 x N-type Female Connectors	
10/100/1000 Base-T RJ-45 port with M25 Calbe Gland	
MANAGEABILITY	
Management and Setup	Web-based (Chrome / IE 9.0 or later)
SNMP agents	MIB II
Protocol	TCP/IP, IPX/SPX, NetBEUI
Network Architecture	PTP (1+0 / 2+0) / Multi-hops Repeating / PTMP
Antenna Alignment	WEB GUI Local / Remote Information
Built-in NMS	Live linking status of the network by GPS coordinates and internet map database
Security	
Data Encryption	WPA-PSK / WPA2-PSK
Advanced Security	MAC access control / Disable SSID / Proprietary protocol
ENVIRONMENT	
Operating Temperature	-30~60 ℃
Storage Temperature	-30~70 ℃
Humidity	95% non-condensing
POWER SUPPLY & CONSUMPTION	
Power Supply : AC 100-264V, 50-60Hz convert to DC 48V Adapter (Max. 45Watts) with 48VDC POE Power Consumption : HYC-N1051C-53 : 10Watts (typical) / 12 Watts (Max.) @ DC 48V HYC-N2051C-27 : 10Watts (typical) / 12 Watts (Max.) @ DC 48V HYC-N2052C-27 : 16Watts (typical) / 19 Watts (Max.) @ DC 48V	
PHYSICAL	
Dimension	259 (L) * 250 (W) * 75 (H) ; mm (External Model) 385 (L) * 385 (W) * 98 (H) ; mm (Integrated Model)
Weight	1.8Kg (External Model) 3.2Kg (Integrated Model)
WARRANTY	
1 YEAR	
ORDERING INFORMATION	
HYC-N1051C-53	4.920~6.075 GHz 0.5 W Outdoor 2x2 MIMO HT-OFDM PTP/PTMP Ethernet Backhaul with 26dBi Integrated Panel Antenna, 14 software selectable channel bandwidth.
HYC-N2051C-27	4.920~6.075 GHz 0.5 W Outdoor 2x2 MIMO HT-OFDM PTP/PTMP Ethernet Backhaul, 14 software selectable channel bandwidth.
HYC-N2052C-27	4.920~6.075 GHz 0.5 W Outdoor 4x4 MIMO HT-OFDM PTP/PTMP Ethernet Backhaul, 14 software selectable channel bandwidth.

■ **True Value of narrow bandwidth with high spectral efficiency**

1. More effective non-overlapping channels for flexible channel Plan
2. More total assumption capacity due to more effective narrow band channels in limited clear band without interferences.

Example: In a 170MHz available range with other interference source



40 MHz channel BW: **1 x effective channel** without interference only, total throughput < 300Mbps.

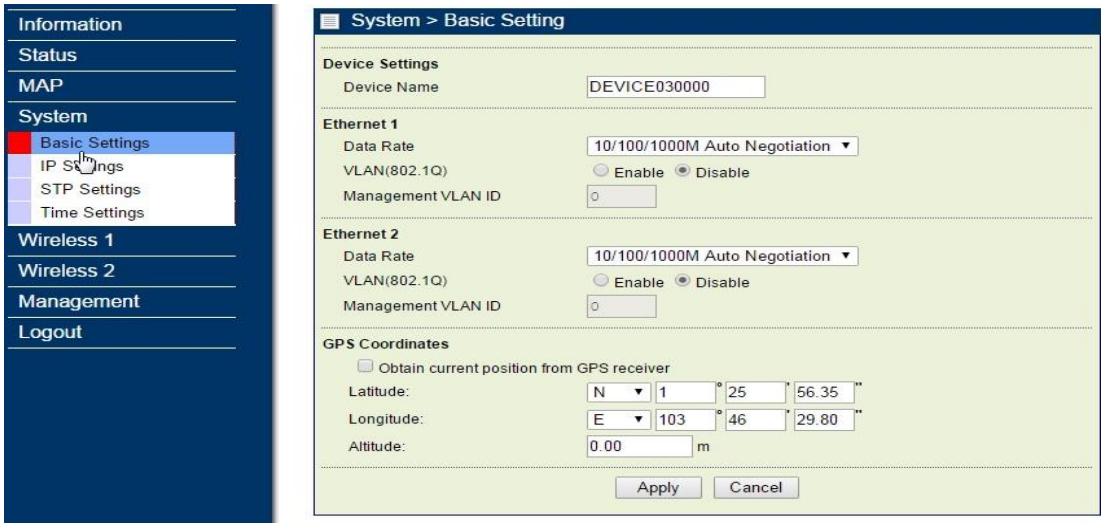
10 MHz channel BW: **6 x effective channels** without interferences, each channel offers 50Mbps TCP throughput. Total throughput about 300Mbps

2.5 MHz channel BW: **24 x effective channels** without interferences, each channel offers 12Mbps TCP throughput. Total throughput about 300Mbps.

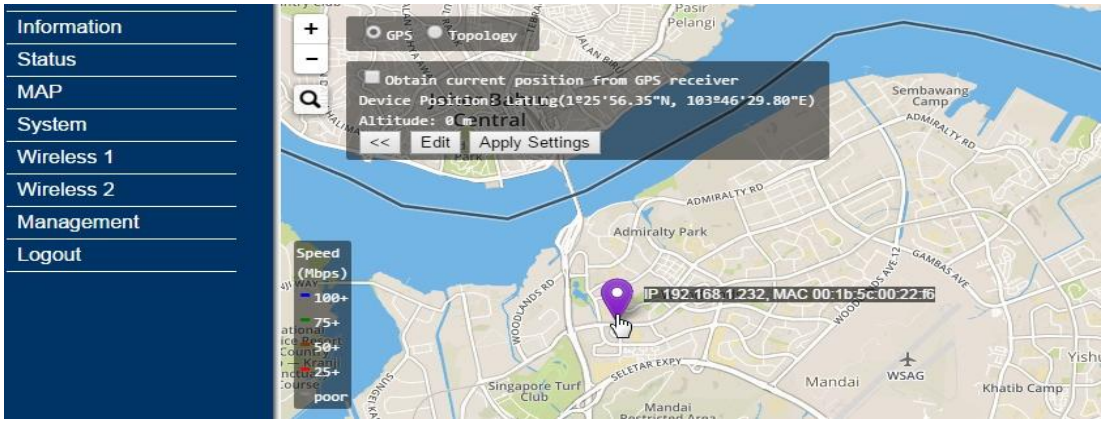
Channel BW (MHz)	2.5	3	3.5	4	5	6	7	8	10	15	20	30	40	52
Real TCP throughput (Mbps)	12	14	17	20	25	30	35	40	51	77	104	158	215	268
Application area	Valuable spectrum				Crowded urban						Rural			

Channel Bandwidth & TCP Throughput list table

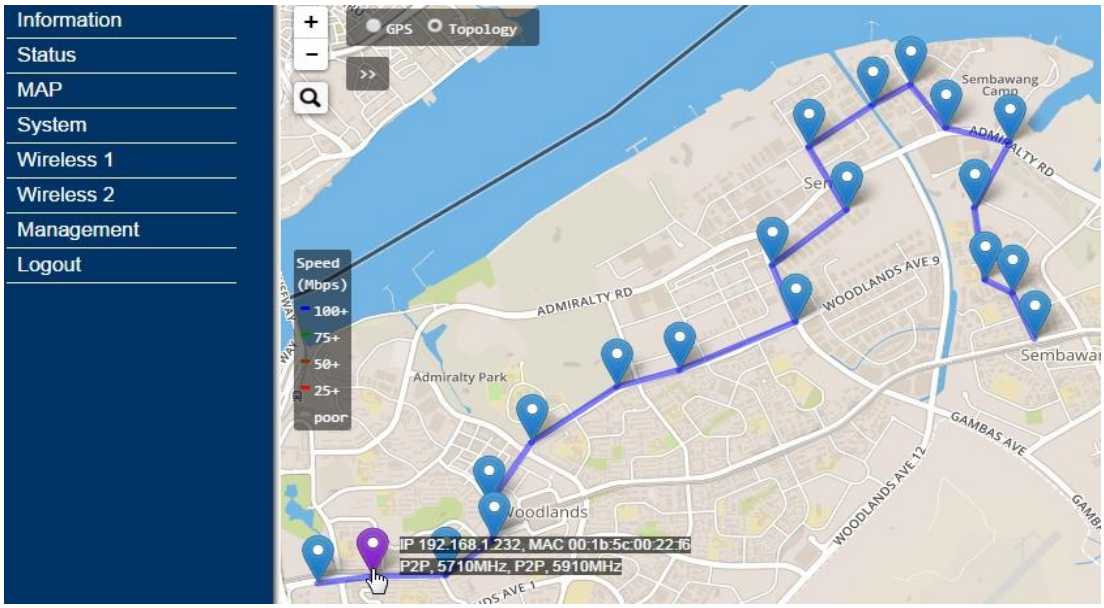
Built-in NMS function --- GPS Coordinates Input setting page



Local Site info -- Device name / MAC address



Remote Site info – IP address / MAC / Operation Mode / RSSI / Data Rate / Distance



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