



# LandRake HYC V 4006-MIMO Series

## 4GHz PTP / NATO Mobile Mesh Series

### HYC (V)406X-27

4.430 ~ 4.930 GHz 2x2 MIMO  
HT-OFDM PTP/Mobile Mesh Radio  
with GPS receiver



HYC-V4006-27

#### Features:

- 4.430 – 4.930 GHz 2x2 MIMO Mobile Mesh Radio
- Self-healing & Self-forming mesh protocol
- $\pm 2$  ppm Frequency Stability for Mobility & NLOS
- 16 Channel BW (2.5 / 3 / 3.5 / 4 / 5 / 6 / 7 / 8 / 10 / 12 / 14 / 15 / 20 / 30 / 40 / 52 MHz)
- 5.2 bits/s/Hz amazing spectral efficiency
- Network Architecture:  
P-T-P / Mobile Mesh (2x2 MIMO)  
1+1 / 2+0 / Ring (Optional by Dual 2x2 MIMO)
- Mobile MESH  
Fast Seamless Roaming  
High Speed up to 180km/hr
- Embedded GPS receiver for coordinates and time
- Build-in NMS via Internet map database
- IEC61000-4-5 Surge Protection
- IP-68 Water & Dust Resistant

With High Throughput 2x2 MIMO HT-OFDM Protocol and Mobile Mesh Network technology, this radio is next generation high capacity Mobile Mesh Radio for 4GHz NATO Band Wireless Network.

There are 16 channel BWs options can be selected by software. (2.5/3/3.5/4/5/6/7/8/10/12/14/15/20/30/40/52 MHz) This feature provides the best flexibility of deployment channel plan in high density city area.

The HYC-4006-27 can be extended to dual 2x2 RF Band (4x4 MIMO) by the other single 2x2 RF Module that operates in other frequency such as 2.3~2.5GHz or 4.9~6.1GHz. It upgrades the system into Dual 2x2 MIMO architecture for better efficiency of the mobile mesh applications or Backhaul & Coverage applications.

For example, an Integrated WiFi AP can be associated by the mobile phone, laptop pad or other Internet devices with standard WiFi interfaces. An Integrated 5GHz Radio can be an efficiency backhaul for alternative channel in the Dual 2x2 RF band. Furthermore, an integrated Li-on Battery pack turns the radio to be a PWS (Portable Wireless System) for urgent & temporary wireless transmission & communication network deployment.

Thus, HYC-4006-27 is absolutely an excellent solution for mining, transportation, disaster response operations, police surveillance and military operation in harsh outdoor environment.

#### Product Highlights

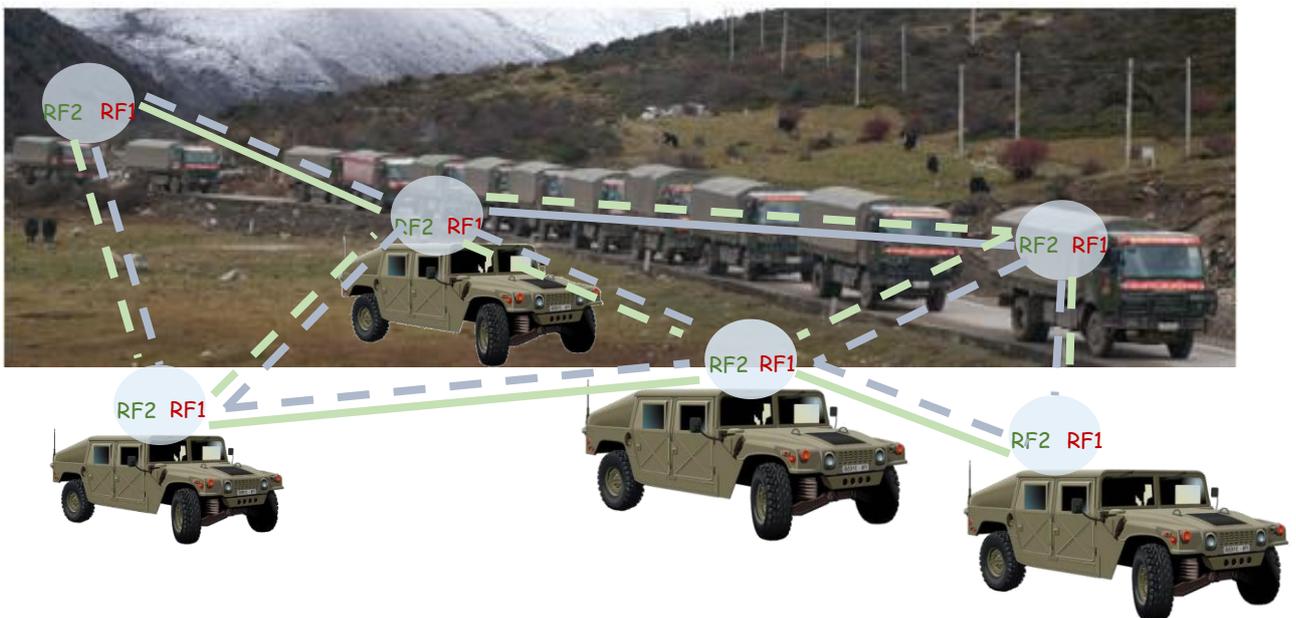
- **Self-healing & self-forming Mesh Protocol**  
Automatic configuration and routing enables the mesh networks to be self-forming and self-healing.
- **Pure and Simple Mobile Mesh Network**  
HYC-(V)4006-27 supports a pure and simple Mesh network, each mesh node in the Mobile Mesh network is equal to each other. One mesh node operation mode for easy configuration
- **Extendable system for Dual bands Radio or PWS**  
The HYC-4006-27 can be extended to dual 2x2 RF Band (4x4 MIMO) by the other single 2x2 RF Module in different frequency. It upgrades the system into Dual 2x2 MIMO architecture for better efficiency of the mobile mesh applications or Backhaul & Coverage applications. an integrated Li-on Battery pack turns the radio to be a Portable Wireless System(PWS) for urgent & temporary wireless network.

## Applications

For rapid deployment, temporary networks or resilient fixed infrastructures, no more power supply constraint!



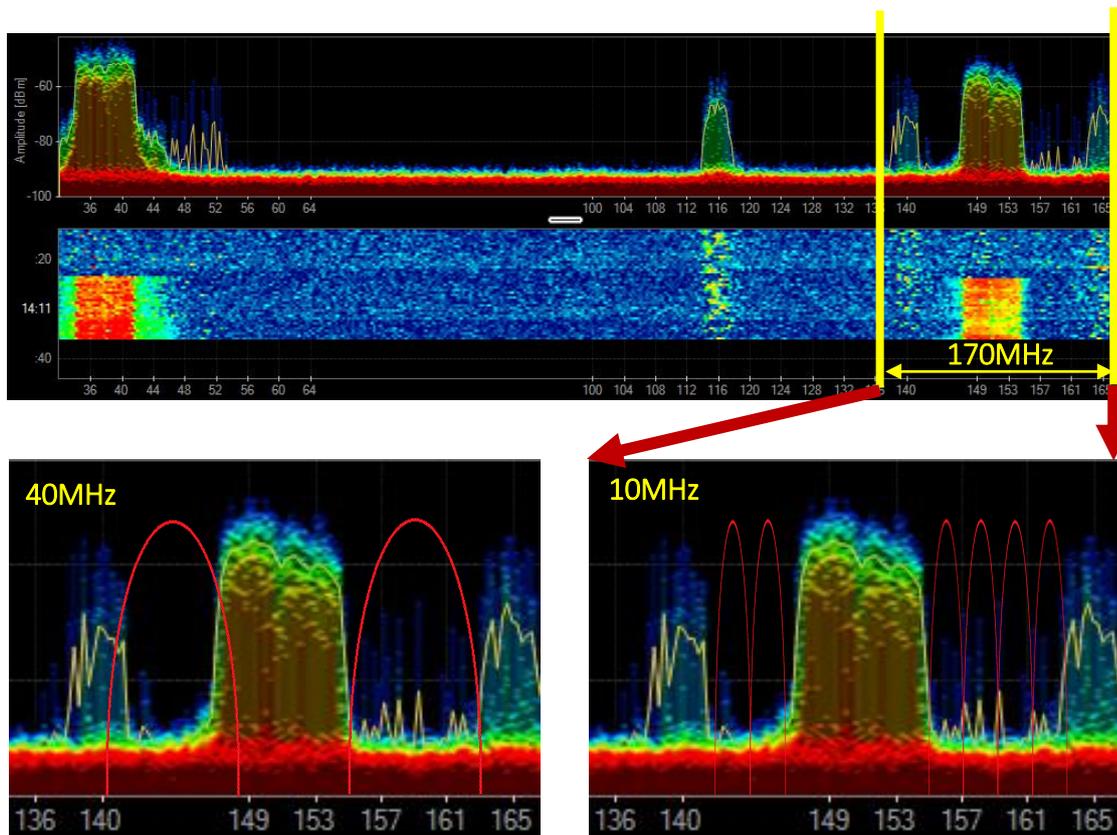
Dual channels Mobile Mesh Network for the military vehicles team



■ 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

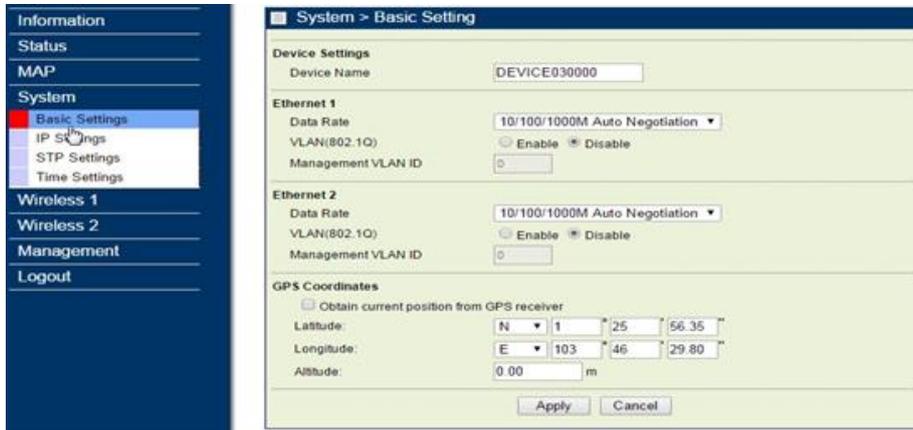
**2.5 MHz** channel BW: **24 x effective channels** without interferences, each channel offers 12Mbps TCP throughput. Total throughput about 300Mbps.

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				

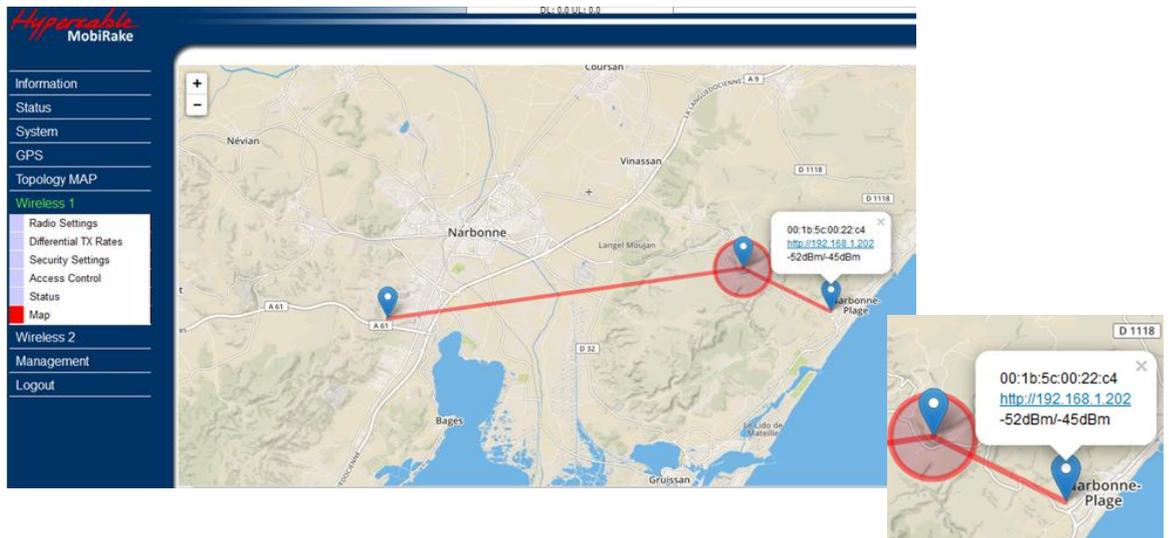
**Channel BW & TCP throughput list table**

# Embedded NMS System

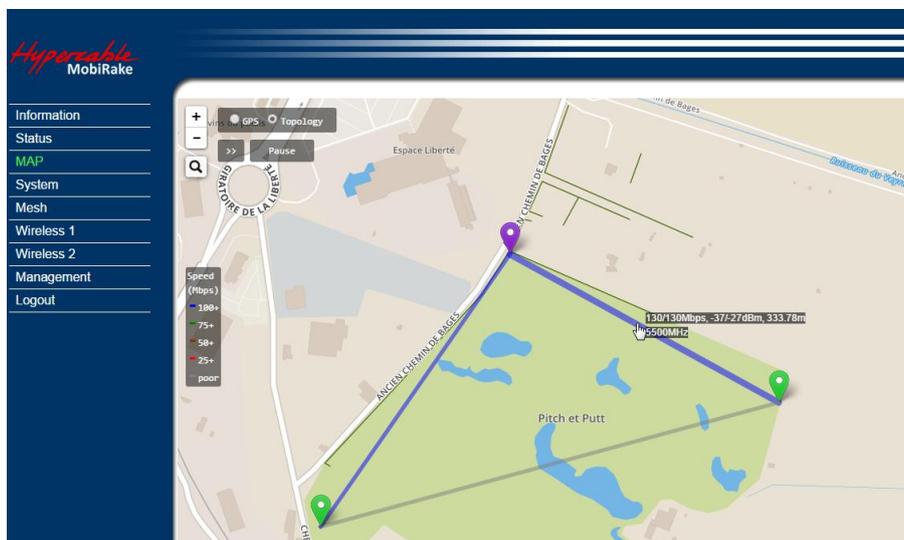
## Embedded NMS function --- GPS Coordinates Input setting page



Map of PTP / PTMP Topology – includes IP / MAC address, Frequency, RSSI and Data rate info.



Map of the Mesh Topology – includes IP / MAC address, Frequency, RSSI and Data rate info.



# Radio Specifications

## 4.430~4.930 GHz Main System

RADIO SPECIFICATIONS						
Frequency range	4.430 ~ 4.930 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	HT-OFDM @ 20MHz			HT-OFDM @ 40MHz		
	Data Rate (Mbps)	Tx Output Power (dBm)	Rx Sensitivity (BER 1 <sup>E</sup> 10 <sup>-6</sup> )	Data Rate (Mbps)	Tx Output Power (dBm)	Rx Sensitivity (BER 1 <sup>E</sup> 10 <sup>-6</sup> )
	GI=800ns			GI=800ns		
MCS8	6.5/13	27(±1.5)	-94/-92 dBm	13.5/27	27(±1.5)	-92/-90 dBm
MCS9	13/26	27(±1.5)	-92/-90 dBm	27/54	27(±1.5)	-89/-87 dBm
MCS10	19.5/39	26(±1.5)	-90/-87 dBm	40.5/81	26(±1.5)	-87/-83 dBm
MCS11	26/52	25(±1.5)	-87/-84 dBm	54/108	25(±1.5)	-84/-81 dBm
MCS12	39/78	24(±1.5)	-84/-81 dBm	81/162	24(±1.5)	-81/-79 dBm
MCS13	52/104	23(±1.5)	-80/-77 dBm	108/216	23(±1.5)	-78/-75 dBm
MCS14	58.5/117	23(±1.5)	-78/-75 dBm	121/242	23(±1.5)	-76/-73 dBm
MCS15	65/130	23(±1.5)	-76/-73 dBm	135/270	23(±1.5)	-74/-72 dBm
INTERFACES						
Wireless Interface : 2 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	<b>HYC-4006-27</b> – PTP / Mesh <b>HYC-V4006-27</b> – Mobile Mesh					
Antenna Alignment	WEB GUI Local / Remote Information					
Radio Locator	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 °C					
Storage Temperature	-30~70 °C					
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 : 30Watts @ DC 48V						
DC 10~30V optional for HYC-V4006-27 vehicle radio version						
PHYSICAL						
Dimension	HYC-4006-27: 259 (L) * 250 (W) *75 (H) ; mm / HYC-V4006-27: 263 (L) * 250 (W) *77 (H) ; mm					
Weight	HYC-4006-27: 1.8 Kg / HYC-V4006-27 : 3 Kg					
WARRANTY						
1 YEAR						
ORDERING INFORMATION						
HYC-4006-27	4.430~4.930 GHz 0.5 W Outdoor 2x2 MIMO HT-OFDM <b>PTP / Mesh</b> radio, 16 software selectable channel BW.					
HYC-V4006-27	4.430~4.930 GHz 0.5 W Outdoor 2x2 MIMO HT-OFDM <b>Mobile Mesh Vehicle</b> radio, 16 software selectable channel BW					

# Radio Specifications

## 4.920 ~ 6.075 GHz Sub-System

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	HT-OFDM @ 20MHz			HT-OFDM @ 40MHz		
	Data Rate (Mbps)	Tx Output Power (dBm)	Rx Sensitivity (BER 1 <sup>E</sup> 10 <sup>-6</sup> )	Data Rate (Mbps)	Tx Output Power (dBm)	Rx Sensitivity (BER 1 <sup>E</sup> 10 <sup>-6</sup> )
	GI=800ns			GI=800ns		
MCS8	6.5/13	27(±1.5)	-94/-92 dBm	13.5/27	27(±1.5)	-92/-90 dBm
MCS9	13/26	27(±1.5)	-92/-90 dBm	27/54	27(±1.5)	-89/-87 dBm
MCS10	19.5/39	26(±1.5)	-90/-87 dBm	40.5/81	26(±1.5)	-87/-83 dBm
MCS11	26/52	25(±1.5)	-87/-84 dBm	54/108	25(±1.5)	-84/-81 dBm
MCS12	39/78	24(±1.5)	-84/-81 dBm	81/162	24(±1.5)	-81/-79 dBm
MCS13	52/104	23(±1.5)	-80/-77 dBm	108/216	23(±1.5)	-78/-75 dBm
MCS14	58.5/117	23(±1.5)	-78/-75 dBm	121/242	23(±1.5)	-76/-73 dBm
MCS15	65/130	23(±1.5)	-76/-73 dBm	135/270	23(±1.5)	-74/-72 dBm
INTERFACES						
Wireless Interface : 2 x N-type Female Connectors						
MANAGEABILITY						
Network Architecture	<b>ATHN4061-27</b> – PTP / Mesh <b>ATHN4061A-27</b> – PTP : 1+0 / 1+1 ( <b>Active backup</b> ) / 2+0 ( <b>Aggregation</b> ) / <b>Ring</b> <b>ATHNV4061-27</b> – Mobile Mesh					
Security						
Data Encryption	WPA-PSK / WPA2-PSK					
Advanced Security	MAC access control / Disable SSID / Proprietary protocol					
ENVIRONMENT						
Operating Temperature	-30~60 °C					
Storage Temperature	-30~70 °C					
Humidity	95% non-condensing					
POWER SUPPLY & CONSUMPTION						
5 Watts						
PHYSICAL						
Dimension	ATHN4061(A)-27: 259 (L) * 250 (W) *75 (H) ; mm / ATHNV4061(A)-27: 263 (L) * 250 (W) *77 (H) ; mm					
Weight	ATHN4061(A)-27: 2.3 Kg / ATHNV4061(A)-27 : 3.5 Kg					
WARRANTY						
1 YEAR						
ORDERING INFORMATION						
ATHN4061-27	4.430~4.93 & 4.920~6.075 GHz 0.5 W Outdoor <b>Dual 2x2 MIMO HT-OFDM PTP / Mesh</b> radio, 16 software selectable channel BW.					
ATHN4061A-27	4.430~4.93 & 4.920~6.075 GHz 0.5 W Outdoor <b>Dual 2x2 MIMO HT-OFDM Aggregation PTP (1+0 / 1+1 / 2+0 / Ring)</b> radio, 16 software selectable channel BW.					
ATHNV4061-27	4.430~4.93 & 4.920~6.075 GHz 0.5 W Outdoor <b>Dual 2x2 MIMO HT-OFDM Mobile Mesh Vehicle</b> radio, 16 software selectable channel BW					

# Radio Specifications

## 2400~2483.5 MHz Sub System

RADIO SPECIFICATIONS						
Frequency range	2.4~ 2.4835 GHz Optional					
Channel Band Width	5 / 10 / 20 / 40 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 <sup>E</sup> 10-6)	Data Rate (Mbps)	Tx Output Power (dBm)	Rx Sensitivity (BER 1 <sup>E</sup> 10-6)
	GI=800ns			GI=800ns		
MCS8	6.5/13	27(±1.5)	-94/-92 dBm	13.5/27	27(±1.5)	-92/-90 dBm
MCS9	13/26	26(±1.5)	-92/-90 dBm	27/54	26(±1.5)	-89/-87 dBm
MCS10	19.5/39	26(±1.5)	-90/-87 dBm	40.5/81	26(±1.5)	-87/-83 dBm
MCS11	26/52	25(±1.5)	-87/-84 dBm	54/108	25(±1.5)	-84/-81 dBm
MCS12	39/78	24(±1.5)	-84/-81 dBm	81/162	24(±1.5)	-81/-79 dBm
MCS13	52/104	23(±1.5)	-80/-77 dBm	108/216	23(±1.5)	-78/-75 dBm
MCS14	58.5/117	23(±1.5)	-78/-75 dBm	121/242	23(±1.5)	-76/-73 dBm
MCS15	65/130	23(±1.5)	-76/-73 dBm	135/270	23(±1.5)	-74/-72 dBm
INTERFACES						
Wireless Interface : 2 x N-Female Connectors						
MANAGEABILITY						
Network Architecture	<b>HYC-4062-27gn</b> – PTP / Mesh with Wi-Fi Coverage (Access Point & Client) <b>HYC-V4062-27gn</b> – Mobile Mesh with Wi-Fi Coverage (Access Point & Client) <b>PWSAN4062-27gn</b> – PTP / Mobile Mesh with Wi-Fi Coverage (Access Point & Client)					
Security						
Data Encryption	WPA-PSK / WPA2-PSK					
Advanced Security	MAC access control / Disable SSID					
ENVIRONMENT						
Operating Temperature	-30~60 °C					
Storage Temperature	-30~70 °C					
Humidity	95% non-condensing					
POWER SUPPLY & CONSUMPTION						
5 Watts						
PHYSICAL						
Weight	600 g					
WARRANTY						
1 YEAR						
ORDERING INFORMATION						
HYC-4062-27gn	4.430~4.93 & 2.4~ 2.4835 GHz 0.5 W Outdoor <b>Dual 2x2 MIMO HT-OFDM PTP / Mesh with Wi-Fi Coverage</b> radio, 16 (4 for 2.4GHz) software selectable channel BW.					
HYC-V4062-27gn	4.430~4.93 & 2.4~ 2.4835 GHz 0.5 W Outdoor <b>Dual 2x2 MIMO HT-OFDM Mobile Mesh Vehicle with Wi-Fi Coverage</b> radio, 16 (4 for 2.4GHz) software selectable channel BW					
PWSAN4062-27gn	4.430~4.93 & 2.4~ 2.4835 GHz 0.5 W Outdoor <b>Dual 2x2 MIMO HT-OFDM PTP / Mobile Mesh with Wi-Fi Coverage PWS</b> (Portable Wireless System), 16 (4 for 2.4GHz) software selectable channel BW.					

### Safe / Green / Efficiency / Long life

### By Advanced Li-ion technology and i-BMS

GEB-14V17 is designed as high efficiency, long life, safe and green power storage device. The new generation power storage battery technology --- Li-ion battery with i-BMS realized this idea. Compares to the traditional lead acid battery, Li-ion supports 250% cycle life, 470% energy density, 200% energy efficiency and only 30% internal resistance.



ELECTRICAL SPECIFICATIONS	
Nominal Voltage	14.3 V
Nominal Capacity	15 Ah
Available Energy ( <i>Beginning of Life</i> )	218 Wh
Maximum Pulse Current	50 A
Maximum Continuous Current	20 A
Operating Temperature	0° C to +45° C
Charging Continuous Current	12 A
Recharge Voltage	18 V
Recommended Float Voltage	16 V
Modularity Maximum Configuration	4 in series 6 in parallel
Storage Temperature	-10° C to +55° C

### Benefits and Features

#### ■ Safety

The battery achieve this high reliability by adding three layers of protection. [1] limiting the amount of active material to achieve a workable equilibrium of energy density and safety; [2] inclusion of various safety mechanisms within the cell; and [3] the addition of an electronic protection circuit in the battery pack.

#### ■ Highly Efficiency

The higher energy density, deeper DOD (Depth of Discharge) and lower internal resistance realized the highly Efficiency.

#### ■ i-BMS for Ultra-Long life

Long recycle life is one of the benefits of Li-ion originally, i-BMS (Intelligent Battery Management System) makes it better.

#### ■ Robust packing and LED indication of battery status

Battery has robust aluminum die-casting enclosure and LED indicators that shows the status of battery.

#### ■ Protecting the Earth

Unlike lead-acid batteries contain heavy metals and strong acid electrolyte, which can easily cause the burden of the earth. Li-ion battery Li-ion batteries provide green energy with less polluting materials to protect this planet.