

<http://www.roderhts.com/products/rapid-deployment-shelters/>



# *Hypercable* Military Camp iP Communications

Landrake Wireless No-Line-Of-Sight and Long Distance iP Connectivity & TVWS  
UHF/VHF WAN Radio <http://whitespaces.microsoftspectrum.com/>

# Networks Architecture



4G/3G mobile Networks

Wired (WAN)

4G/LTE signal



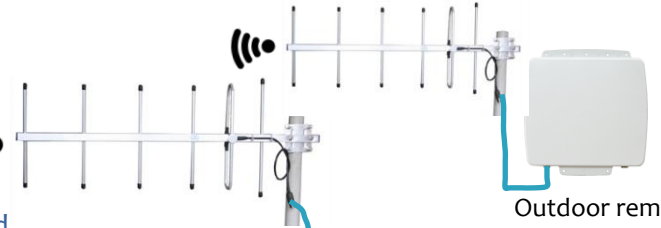
4G/LTE WAN

Base station

600MHz 2Watts 64QAM  
Dual WAN (Wired & 4G) redundancy



HT-OFDM UHF band  
PTMP/TDMA Wireless Link



Outdoor remote  
HYC-N300cS series

Indoor remote  
HYC-LTRG201cS series



Ethernet

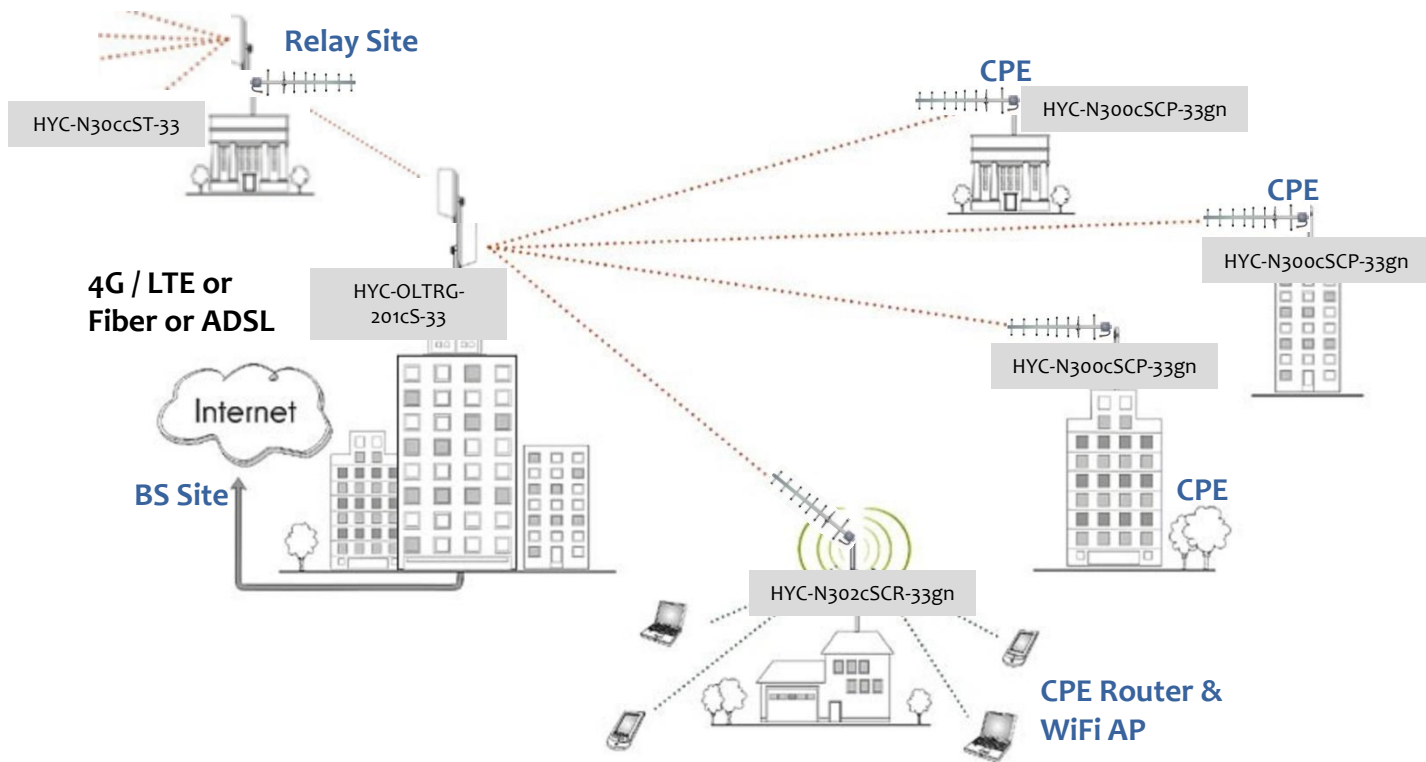
Outdoor Remote (600MHz 2Watts 64QAM):

- ✓ Outdoor UHF band remote
- ✓ Outdoor UHF band remote router via WiFi AP Router

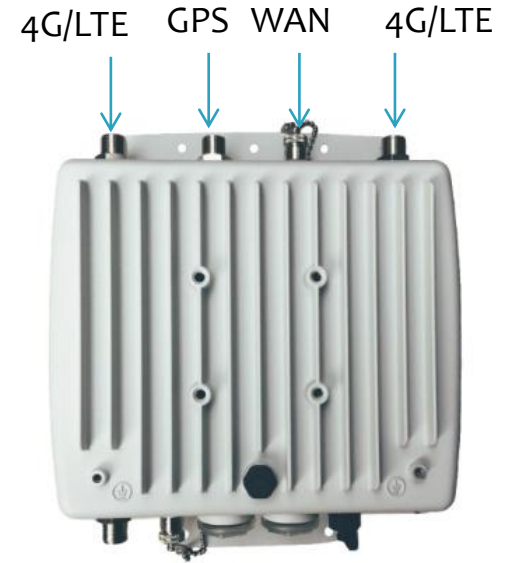
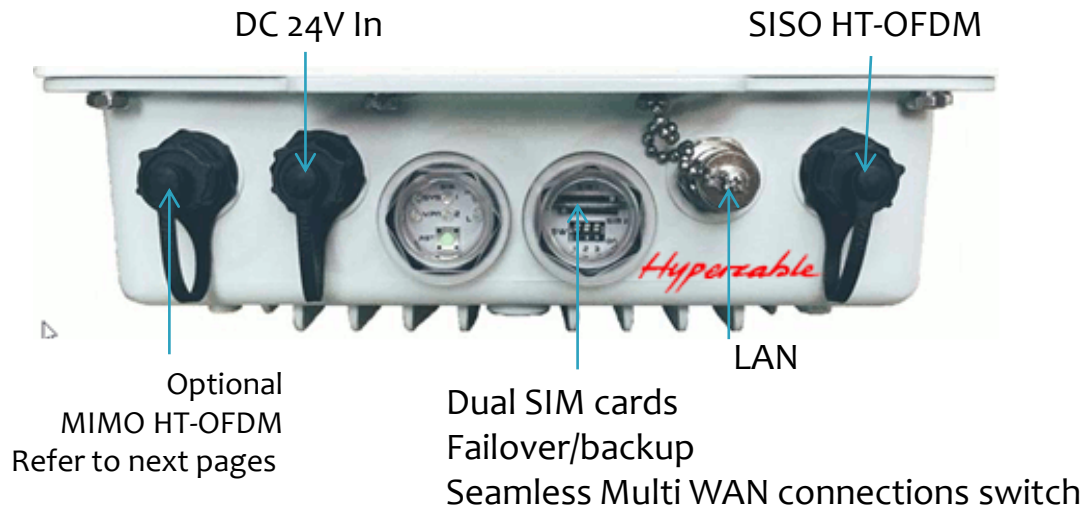
Indoor Remote (600MHz 2Watts 64QAM):

- ✓ Indoor UHF band remote
- ✓ Indoor UHF band remote router
- ✓ Indoor UHF band remote router via WiFi AP Router

# 600MHz NLOS Network & WiFi Access



# Outlook of Base Station



# Specifications

Model Name	HYC-OLTRG-201cSB-33	HYC-N300cST-33	HYC-LTRG-201cSCP-33	HYC-LTRG-201cSCP-33gn
Model Contents	BS - Outdoor LTE Router + 600MHz HT-OFDM BS	BS - Outdoor 600MHz HT-OFDM BS	CPE - Indoor (Remote) 600MHz HT-OFDM CPE	CPE - Indoor (Remote) 600MHz HT-OFDM CPE + 2.4GHz WiFi Router
LTE backhaul				
Router Embedded	Yes	n/a	n/a	n/a
RF POWER of LTE FDD	23dBm +/- 2dB	n/a	n/a	n/a
RF POWER of LTE TDD	23dBm +/- 2dB	n/a	n/a	n/a
Two SIM cards wireless connectivity	failover / roaming over / back up	n/a	n/a	n/a
600MHz HT-OFDM Last Mile Connectivity				
Operating Frequency range	600 - 620MHz	600 - 620MHz	600 - 620MHz	600 - 620MHz
Customized Frequency range	10MHz - Sub-1GHz	10MHz - Sub-1GHz	10MHz - Sub-1GHz	10MHz - Sub-1GHz
Modulation	64QAM	64QAM	64QAM	64QAM
RF POWER	2Watts	2Watts	2Watts	2Watts
Channel Bandwidth	2.5/3/3.5/4/5/6/7 MHz	2.5/3/3.5/4/5/6/7 MHz	2.5/3/3.5/4/5/6/7 MHz	2.5/3/3.5/4/5/6/7 MHz
Channel Step	500kHz	500kHz	500kHz	500kHz
Antenna System	1x1 SISO	1x1 SISO	1x1 SISO	1x1 SISO
Throughput (1 x 1 SISO)	17Mbps the max in 7MHz	17Mbps the max in 7MHz	17Mbps the max in 7MHz	17Mbps the max in 7MHz
Operation mode	Base Station (TDMA)	Base Station (TDMA) / CPE / PTP	CPE	CPE
QoS flow control (CPE)	YES (Q1, 2018)	YES (Q1, 2018)	-	-
Interfaces	N-type connectors x 2 (LTE) N-type connector x 1 (GPS) N-type connector x 1 (600MHz BS) M12 x 2 (LAN & WAN) DC 24 In SIM slots x 2 LED	N-type connector x 1 (600MHz BS) M25 PoE Ethernet Port LED Antenna Alignment	SMA connector x 1 (600MHz CPE) RJ45 connector x 1 (LAN) DC plug (AC 100 - 264V) LED	SMA connector x 1 (600MHz CPE) SMA connector x 2 (2.4GHz WiFi AP router) RJ45 connector x 2 (WAN & LAN) DC plug (AC 100 - 264V) LED
Operating Temperature	-30 - 70 °C	-30 - 70 °C	-30 - 70 °C	-30 - 70 °C
Dimension	259 (L) * 250 (W) * 75 (H) ; mm	259 (L) * 250 (W) * 75 (H) ; mm	165.2 (L) * 110 (W) * 31.6 (H) ; mm	
Weight	1.9Kg	1.8Kg	0.46Kg	

# Throughput of WAN 4G/LTE

Band	IPERF			
	TCP		UDP	
	DL Throughput	UL Throughput	DL Throughput	UL Throughput
	Mbits/sec	Mbits/sec	Mbits/sec	Mbits/sec
1	56.2	52.2	82	48.9
3	54	52.2	83.3	48.7
5	58	23.5	70	24.1
7	60.8	52.3	82.8	49
8	47.8	27.6	70.8	23.6
20	53.8	52.3	81.2	48.8
38	55.8	12.9	82.9	9.39
40	56.5	12.9	82.3	9.6
41	52.3	12.9	80.9	9.37



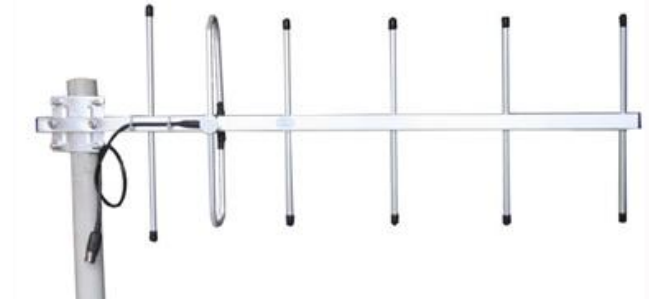
# Antenna of Base Station

Model	ANTU606508-S65-NF
Frequency	600-650MHz
VSWR	<1.5
Input Impedance	50Ω
Gain	8dBi
Beam-width Horizontal	65°
Beam-width Vertical	65°
Polarization Type	Vertical or Horizontal
Maximum Input Power	100W
Dimension, HxWxD	310x310x150 mm
Weight	3Kg
Radome Material and Color	ABS, white
Reflector Material	Aluminum
Radiating Element Material	Aluminum
Connector Type	N type
Environmental Class	Outdoor
Diameter of the pole	Φ20 to φ80mm



# Antenna of CPE (Remote)

Model	ANTU606210-Y-NF
Frequency	600-650MHz
VSWR	<1.5
Input Impedance	50Ω
Gain	10dBi
Front to Back Ratio	≥15dB
Vertical Plane $\Theta_{HP}$	55°
Horizontal Plane $\Theta_{HP}$	70°
Polarization Type	Vertical or Horizontal
Maximum Input Power	100W
Lightning protection	DC ground
Connector Type	N -Female
Number Of Element	6
Weight	600g
Length -Without Input Cable	70cm
Rated Wind Velocity	241km/h





# Ordering Information

Model Name	Descriptions	Radio Type
<b>Base Station</b>		
HYC-OLTRG-201cSB-33	Outdoor IP68 4G LTE Router + 600MHz HT-OFDM 2Watts Base Station, antenna-external	IP68 Outdoor
HYC-N300cST-33	600MHz 2Watts TV White Space last mile & PTMP/TDMA protocol, Base Station	IP68 Outdoor
<b>Extender</b>		
HYC-N300cST-33	600MHz dual 2Watts, dual base stations & hops-relay radio	IP68 Outdoor
<b>Remote (CPE)</b>		
HYC-N300cSCP-33	Outdoor 600MHz HT-OFDM 2Watts CPE	IP68 Outdoor
HYC-N302cSCR-33gn	Outdoor 600MHz HT-OFDM 2Watts CPE Router with 802.11n 0.5W WiFi Access Point Router	IP68 Outdoor
HYC-LTRG-201cSCP-33	Indoor 600MHz HT-OFDM 2Watts CPE (Client mode)	Indoor
HYC-LTRG-201cSCR-33	Indoor 600MHz HT-OFDM 2Watts CPE Router	Indoor
HYC-LTRG-201cSCR-33gn	Indoor 600MHz HT-OFDM 2Watts CPE Router with 802.11n 0.5W WiFi Access Point Router	Indoor
<b>Antenna</b>		
ANTU606208-M-NM	600 - 620 MHz 8dBi Omni antenna Horizontal 360°& vertical 30°(1400 mm length), N-Male	
ANTU606205-M-NM	600 - 620 MHz 5dBi Omni antenna Horizontal 360°& vertical 50°(700 mm length), N-Male	
ANTU606210-Y-NF	600 - 650 MHz 10dBi Yagi antenna Horizontal 70°& vertical 55°(700 mm length), N-Female	
ANTU606508-S65-NF	600 - 650 MHz 8dBi Sector antenna Horizontal 70°& vertical 65°(310x310x150mm), N-Female	

# Distance of wireless UHF band link

Distance	Antenna 1	Antenna 2	RSSI / Margin	Modulation	Throughput	NOTE
1KM	8dBi (Sector/Omni)	2dBi (Omni)	-70dBm/20dBm	MCS13 (64QAM 2/3)	14Mbps (7MHz)	BS - CPE (for Malls Inside coverage)
10KM	8dBi (Sector/Omni)	10.5dBi (Yagi directional)	-72dBm/10dBm	MCS13 (64QAM 2/3)	14Mbps (7MHz)	BS - CPE
20KM	8dBi (Sector/Omni)	10.5dBi (Yagi directional)	-78dBm/10dBm	MCS11 (16QAM1/2)	7Mbps (7MHz)	BS - CPE
30KM	10.5dBi (Yagi directional)	10.5dBi (Yagi directional)	-78dBm/10dBm	MCS11 (16QAM1/2)	7Mbps (7MHz)	Extender - Extender (PTP) - Near-LOS
40KM	10.5dBi (Yagi directional)	10.5dBi (Yagi directional)	-82dBm/10dBm	MCS10 (QPSK3/4)	6Mbps (7MHz)	Extender - Extender (PTP) - Near-LOS

## NOTE:

- 1, Antenna system: SISO
- 2, Operating frequency 600 - 620 MHz
- 3, 2Watts RF power

## Type of Building / Penetration Loss (dB)

- ✓ Large Commercial bldg or shopping Mall (15dB)
- ✓ Small to Medium Offices, Stores or Factories (10dB)
- ✓ Residential and Light Commercial Bldgs (5dB)
- ✓ Typical Automobile (5dB)