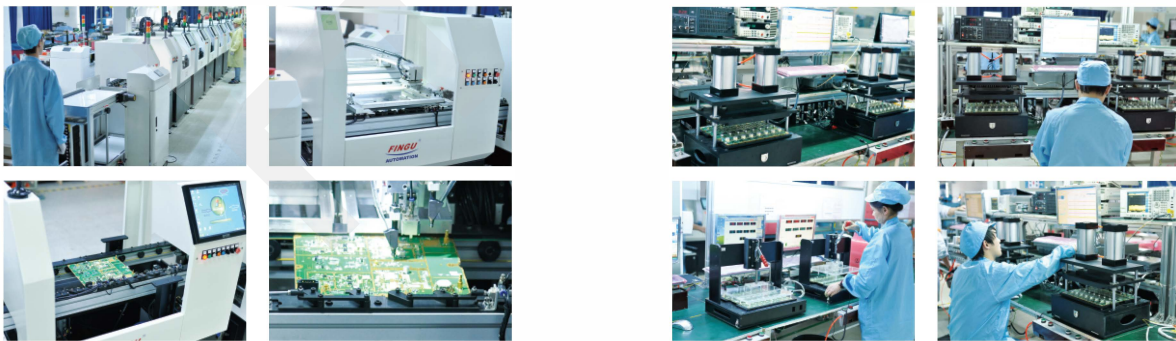


# About US

- **Our Customer:** Our Clients: Our clients include leading global communication equipment manufacturers and consumer electronics manufacturers.
- **R&D Experience:** We have developed over 300 types PA in the past 10 years, our PA design team has over 50 engineers, 30% of them have more than 10 years of PA design experience.
- **Manufacture Capacity:** The PA manufacture capacity is 2,000 units per day.
- **Delivery Quantity:** In the last 10 years, we have delivered over 3 million units of PAs to our customers and these PA products have been widely used in the global public and private communication networks.



SMT line



Auto-assembly line

Auto-testing line

# Power Amplifier Solution for ISM

## Medical Electrical Equipment Power Amplifier

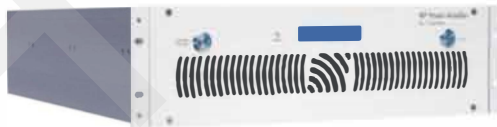


We provide high output power amplifier used in MRI (Magnetic Resonance Imaging) system, including 6KW – 20KW MRI power amplifiers.

### Key Features

- Operating Frequency Band: 10~30MHz
- High Output Power Dynamic Range: 60dB
- Flexible Power Supply: 100 to 250 VAC Single Phase
- Standard Mechanical: 3U/4U depending on the output power
- Support self-detection function
- Support open circuit / short circuit protection
- Support RS-232, RS-485 or Ethernet Protocol
- Support over temperature/drive alarm

## Electro Magnetic Compatibility Power Amplifier



RF Power Amplifier is a power amplifier designed primarily for EMC applications including rigorous antenna and test chamber requirements. Utilizing GaAs technology, this RF amplifier provides higher linearity, rugged design and better efficiency performance versus silicon-based amplifiers.

### Typical Features

- IEC/EN 61000-4-3, 3 or 10 V/m
- High Reliability: MTBF > 200000 hours
- Excellent Performance and Efficiency
- Support Interface: GPIB, LAN
- Frequency Range: 80 MHz to 1 Ghz
- Output Power: 100W Max or Customized
- Flexible power supply: 100 to 250 VAC Single Phase
- Mechanical: Standard x U

# RF Module ODM Solution for Indoor and Outdoor Wireless Network Enhancement Product.

## Solution 1 PA Module



Class AB PA

Doherty high efficiency PA

Feedforward PA

- We can provide customized PA module designed and manufactured based on clients' requirements, and common PA modules for clients to select from our product catalogue
- The PA types include class AB PA, high efficiency Doherty PA and feedforward PA

## RF Module Functions and Features

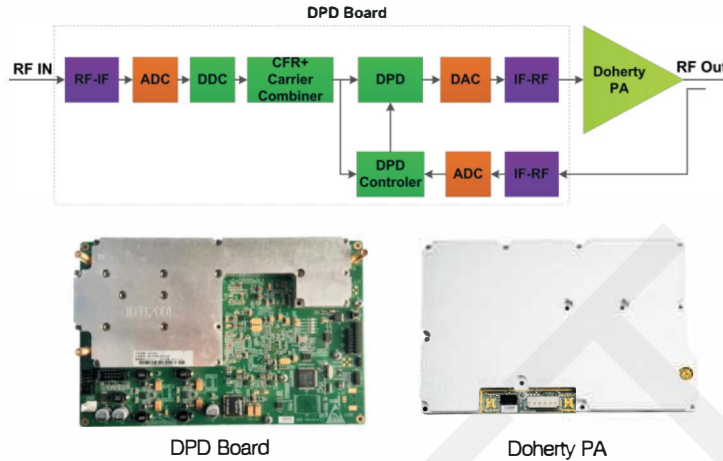
### Support Alarm Function:

- Over temperature alarm
- Output RF port VSWR alarm
- Over drive alarm
- PA Gain failure alarm
- LNA failure alarm
- PA Component failure alarm

### Support control and detection function

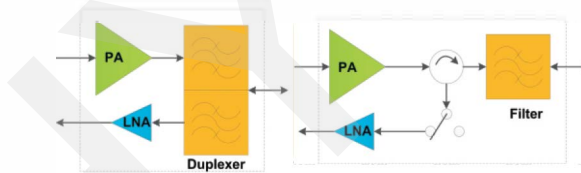
- Input and output power detection
- The adjustment range of the output power is 50dB with an adjustment accuracy of 0.5dB
- The PA firmware can be remotely updated online
- The output power accuracy is  $\pm 0.3$  dB in a 30dB dynamic output power
- The temperature detection accuracy is  $\pm 1^{\circ}\text{C}$
- PA power consumption detection function
- High reliability – the MTBF of the RF module is higher than 250000 hours

## Solution 2 PA + DPD Module



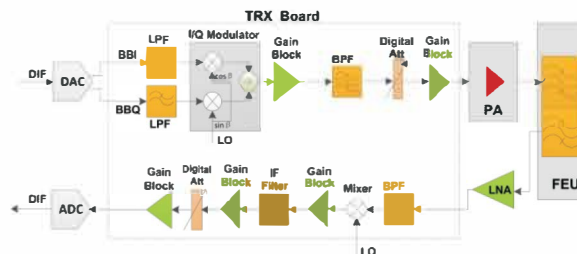
- We can provide DPD(digital pre–distortion board) + high efficiency Doherty PA solution, in which the PA efficiency is higher than 40%, making it a green solution for wireless network enhancement products
- The delay of the whole TX link including DPD board and PA is less than 5us
- The DPD board supports max 65MHz IBW on WCDMA, GSM and LTE, and is able to operate on different frequency bands from 700MHz to 3.5GHz by changing just a few filters on the board

## Solution 3 PA + Filter



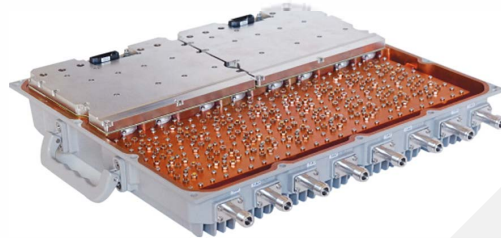
Our product can accommodate different frequency bands of your wireless network enhancement products by changing just a few PAs and filters. Wireless network enhancement product provider face more and more frequency bands and need more and more kinds of PA and filter to meet customer requirements. We have full experiences in PA + filter module design, so we can quickly response to customer's requirements and help them to shorten the time of product from R&D to marketing.

## Solution 4 PA + Filter + TRX Board



We also provide the whole RF part of a wireless network enhancement product. The part includes TRX, PA and duplexer/filter so that you only need to design and manufacture one digital board for a series of products that answer to various marketing demands. Our solution will make your design and manufacture process quicker, simpler and more cost-efficient.

## Macro-BTS PA+ Filter Solution



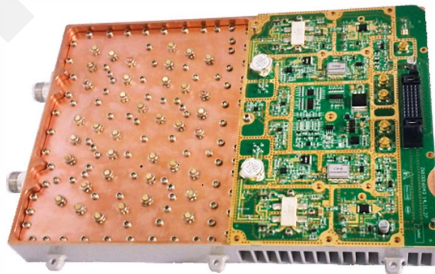
8 Path 8\*20W PA+ Filter

We also provide design and manufacture services for the whole PA + filter part

## Small Cell RF Power Amplifier Solution

- Support : FDD LTE, TDD LTE, WCDMA, CDMA, TD-SCDMA, etc.
- Operating Frequency Band: 400MHZ, 700MHZ, 800MHZ, 900MHZ, 1800MHZ, 1900MHZ, 2100MHZ, 2300MHZ, 2600MHZ and 3500MHZ
- Support Operating BW: 10MHZ~200MHZ(LDMOS)  
5MHz~500MHz (GaN)
- Support IBW: 5MHZ~145MHZ(LDMOS)  
10~500MHz (GaN)
- Support Output Power: 0.05W~10W
- PA Efficiency: 20%~40% according to the PA output power, input signal PAR and IBW
- PA Architecture: 2T2R, 4T4R

## Small Cell RF PA+ Filter Solution



TDD-LTE 2 Path 1.8GHz 2\*5W PA+ Filter solution

We can provide PA+ Filter solution for small cell based on clients' requirements. The filter can be cavity filter, cavity + ceramic resonator or pure ceramic filter.

# Macro-BTS RF Power Amplifier Solution

We design and manufacture macro-BTS RF power amplifiers based on customer requirements. The key features of our power amplifier are:

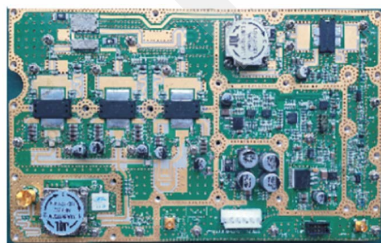
- Support : FDD LTE, TDD LTE, WCDMA, CDMA, TD-SCDMA, GSM, TETRA, eLTE, etc.
- Operating Frequency Bands: 230MHZ, 400MHZ, 600MHZ, 700MHZ, 800MHZ, 900MHZ, 1500MHZ, 1800MHZ, 1900MHZ, 2100MHZ, 2300MHZ, 2600MHZ and 3500MHZ
- Support Operating BW: 10MHZ~194MHZ (LDMOS)  
10MHZ~500MHz (GaN)
- Support IBW: 5MHZ~145MHZ (LDMOS)  
10~500MHz (GaN)
- Support Output Power: 2W~250W
- PA Efficiency: 30%~50% according to the PA output power, input signal PAR and IBW
- PA Architecture: 1T, 2T2R, 2T4R, 4T4R, 8T8R
- High Efficiency Technology: Doherty, E-Doherty, Multistage Doherty, Asymmetric Doherty, 3 – way Doherty



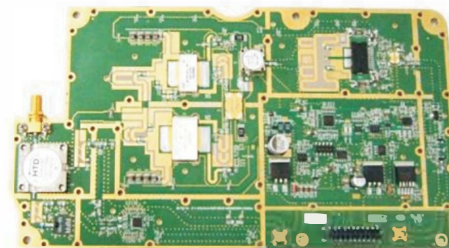
E-Doherty



Multi-Stage Doherty

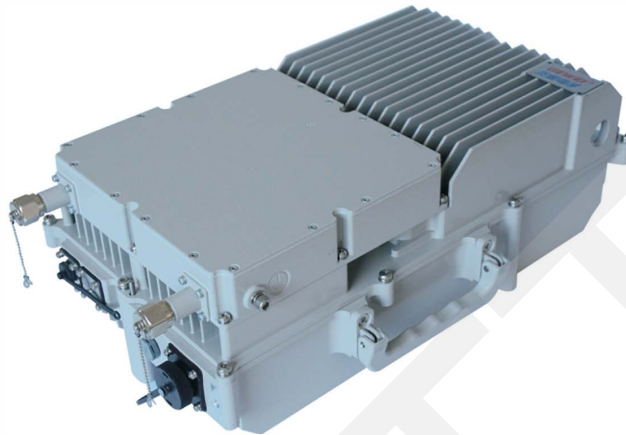


3 – way Doherty



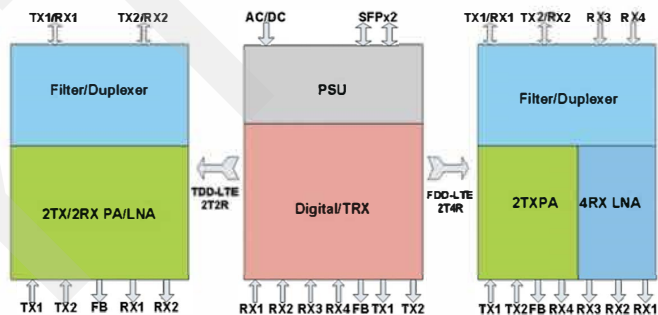
Asymmetric Doherty

## 2 Paths LTE RRH



### Product Features

- Support 3GPP TS 36.141 and 3GPP TS 36.104 V9.0.0
- Support different bands/output power with one SW Load
- Support 700MHz to 3.5GHz with one single digital and TRX PCB board and interchangeable filters on the TRX link that accommodate different frequency bands
- Uniform housing for the side digital/TRX board and power supply
- One PSU
- Support TDD-LTE 2T2R and FDD-LTE 2T2R/2T4R



### Key Functions and Performance

- **Output Power:** 2\*60W Max
- **IBW:** 60MHz Max
- **Support Carrier Configuration:** Support 5MHz, 10MHz, 15MHz, 20MHz carrier on any configuration within the operating frequency band. Support up to 3 carriers
- **Receiving sensitivity:** -104 dBm ( 20 MHz E-UTRA signal )
- **Support Interface Protocol:** IR for TDD-LTE, CPRI for FDD-LTE
- **Support Optical Rate:** Support 4.9152 Gbps, 6.144Gbps and 9.8304Gbps with automatic rate matching function
- **Support:** 2\*2 MIMO
- **RRH Efficiency:** RRH 28 -32 %
- **Volume/Weight:** 12.4L for 2T/2R TDD-LTE ,16.1L for 2T/4R FDD-LTE
- **Support Protection Grade:** IP65
- **Reliability:** MTBF > 200000 Hours

## 4 Paths LTE RRH



### Product Features

- Support 3GPP TS 36.141 and 3GPP TS 36.104 V9.0.0
- Support different band/output power with one SW Load
- Support 700MHz to 3.5GHz with one digital and TRX PCB board and interchangeable filters on the TRX link that accommodate different frequency bands
- Uniform housing for the side digital/TRX board and power supply
- One PSU
- Support TDD-LTE 4T4R and FDD-LTE 4T4R

### Key Functions and Performance

- Output Power : 4\*40W Max
- IBW : 60MHz Max
- Support Carrier Configuration : Support 5MHz, 10MHz, 15MHz and 20MHz carriers on any configuration within operating frequency band. Support up to 3 carriers
- Receiving sensitivity : -104 dBm ( 20 MHz E-UTRA signal )
- Support Interface Protocol : IR for TDD-LTE, CPRI for FDD-LTE
- Support Optical Rate : Support 4.9152 Gbps, 6.144Gbps and 9.8304Gbps with automatic rate matching function
- Support 4\*4 MIMO
- RRH Efficiency : RRH 28 - 30%
- Volume/Weight : 24L / 24Kg
- Support Protection Grade: IP65
- Reliability : MTBF > 200000 Hours



## 8 Paths TDD-LTE RRH



### Product Features

- Support 3GPP TS 36.141 and 3GPP TS 36.104 V9.0.0
- Support different band/output power with one S/W Load
- Support from 1.9GHz to 3.5GHz with one digital and TRX PCB board and interchangeable filters on TRX link that accommodate different frequency bands
- Uniform housing for the side digital/TRX board and power supply
- One PSU

### Key Functions and Performance

- Output Power: 8\*20W Max
- IBW: 60MHz Max
- Support Carrier Configuration: Support 5MHz, 10MHz, 15MHz and 20MHz carriers on any configuration within operating frequency band. Support up to 3 carriers
- Receiving sensitivity: -104 dBm ( 20 MHz E-UTRA signal )
- Support Interface Protocol: IR
- Support Optical Rate: Support 4.9152 Gbps, 6.144Gbps and 9.8304Gbps with automatic rate matching function
- Support 8\*8 MIMO
- RRH Efficiency: RRH 26 %
- Volume/Weight: 24 L / 22Kg
- Support Protection Grade: IP65
- Reliability: MTBF > 200000 Hours

# Enterprise BTS RRH/TRDU

## TETRA/OMR RRH/TRDU



We have designed and manufactured TETRA, DMR and PDT RRH / TRDU products that are widely used in areas including Public Security, State Grid, Oil Mining, Harbors and Metro Networking.

- High reliability MTBF > 250000 hours
- High linear performance: -70dBc
- TETRA RRH/TRDU Support up to 2 Carriers
- PDT/DMR RRH/TRDU Support up to 4 Carriers
- Support 3 Diversity receiving for TETRA RX link
- High reception sensitivity: -120dBm/25KHz
- High protection grade: IP67
- Support remote update online.
- Common PMR RRH platform to support 360MHz, 380MHz, 390MHz, 420MHz, 800MHz frequency bands with related SW downloads

## eLTE RRH



We have been designing and manufacturing eLTE RRH products that are widely used in State Grid, Oil Mining, Harbors, etc.

- Support 340 carriers and each carrier band is 25KHz
- High reliability: MTBF > 200000 hours
- High protection grade: IP65
- High reception sensitivity: -120dBm
- Peak downlink speed 14.96Mbps
- Support narrow-band and wide-band at the same time
- The TDD duplex mode makes the frequency utility efficiency even higher

# eDAS/oDAS



Access Unit



TMA Unit



Remote Unit for Outdoor Coverage



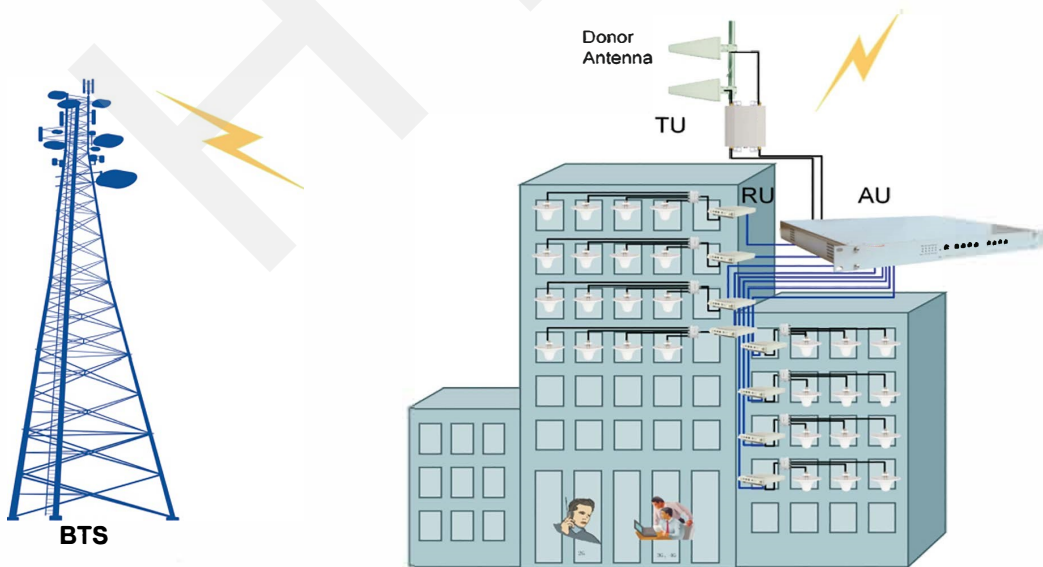
Remote Unit for Indoor Coverage

eDAS / oDAS system receives signals from base stations via donor antennas and the Tower Units (TU), feeds them to Access Units (AU) after amplifying the signals with minimum noise, the AUs then process and digitalize the signals and transmit the processed signals to Remote Units (RU), which cover all adjacent areas with good strong mobile phone signals.

Compared with conventional indoor coverage solutions, eDAS/oDAS produces better signal coverage in medium and small areas normally considered difficult to get a good signal, such as hotels and low-rise buildings.

## Typical Applications

Wireless signal enhancement in small and medium areas, including hotels, offices, supermarkets, low rise buildings with a floor space up to 2,000 m<sup>2</sup>, and 2G, 3G and 4G signal enhancement in all types of small and medium areas.



— RF Cable      AU: Access Unit    TU: Tower Unit  
 — Optical Cable    — LAN Cable      RU: Remote Unit

## Product Feature

- Support multi-band 2G, 3G and 4G signals with a shared net
- Free of link budget
- Simple to install without need for skilled technicians ( reduce CapEx )
- Distributed structure, flexible upgrade, support up to 48 RUs
- Support optical or Ethernet cable networking
- Improve the network quality with noise suppression, automatic frequency tracking, automatic calibration for time delay, etc.
- Support remote monitor and firmware update online

## Specifications

Item	Technical Specifications
Supporting Protocols	Multi mode 2G+ 3G, 3G+4G, support up to 2 Bands
Output Power	DN: 23dBm (Outdoor) /13dBm (Indoor) ; UP: 23dBm
Maximum Gain	75dB
Gain Adjustment Range	30dB
Maximum input	-10dBm
ALC range	≥ 20dB
System Time Delay	CDMA: ≤10us WCDMA: ≤10us LTE: ≤8us
Noise Figure	≤7dB
Spurious Radiation	Comply with 3Gpp
Out of Band Gain	Comply with 3Gpp
Input/Output Intermodulation	Comply with 3Gpp
VSWR	≤1.5
Network Capacity	48RUs
Monitor	Local : RS-232 & Ethernet Remote : SMS & Ethernet

## Mechanics and Other Features

Item	TMA Unit (TU)	Access Unit (AU)	Remote Unit (Indoor)	Remote Unit(Outdoor)
Power Adaption	Remote power supply from AU	90~240VAC, 50/60Hz		
Installation	Mount against wall or pole	Mount against wall or in a machine cabinet	Desktop installation	Mount against wall or pole
Size	200mm*175mm*35mm	483mm*350mm*44mm	195mm*170mm*66mm	268mm*200mm*40mm
Weight	3kg	2.5Kg	1.5kg	2.4kg
Operating Temperature	-30°C ~ +55°C	0°C ~ +45°C	0°C ~ +45°C	-30°C ~ +55°C
Operating Humidity	≤95%			
Storage temperature	-40°C ~ +85°C			
Supporting Protection Grade	IP65	IP30	IP30	IP65

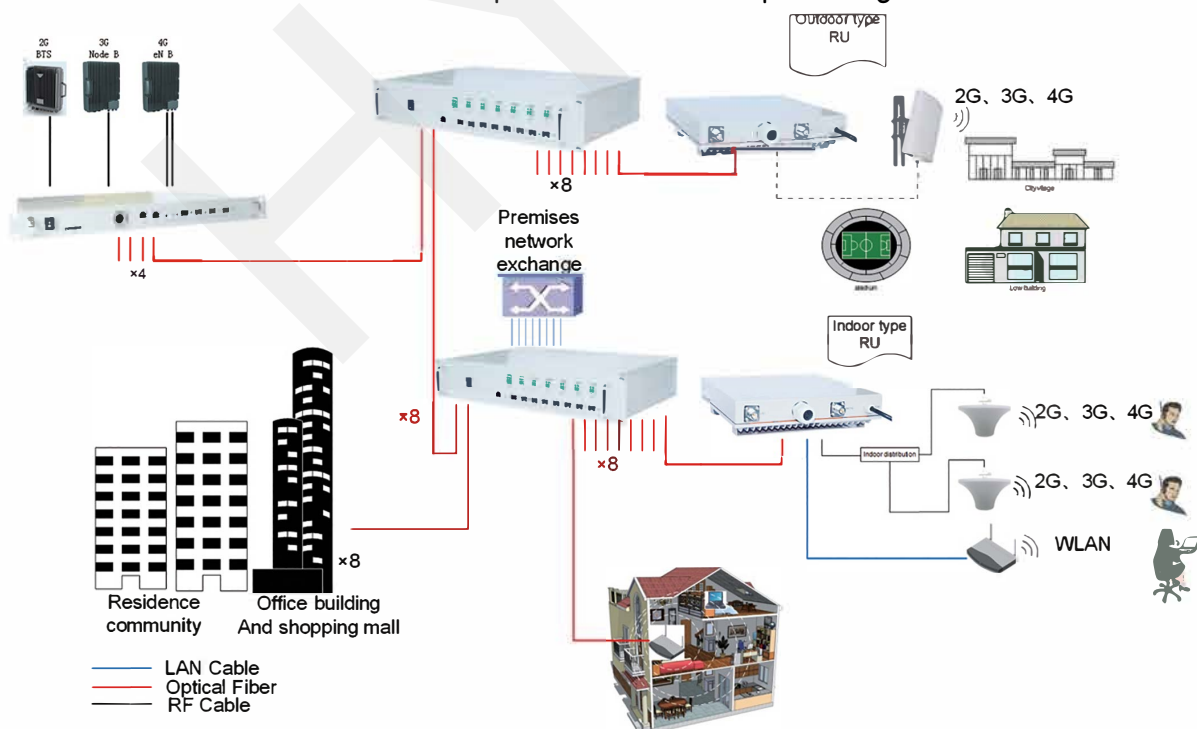
# Multi-service Digital Distributed System (MDAS)



A Multi-service Digital Distributed System (MDAS) receives RF signals on various bands with an AU, which passes the signals through an optical fiber to EUs (EUs can access broadband internet directly), then the EUs transmit the signals to RUs through Ethernet cable or fiber so that the RUs can cover their neighborhood with good signals.

Compared with conventional indoor coverage solutions, MDAS can product better coverage in places normally considered to be “difficult” to get a good signal, such as complex residential compounds, high-rise buildings, etc.

City village, residence community, office buiding, stadium, etc.  
Solution plan of multi-net deep coverage



## Typical Application

Hotels, office buildings and sky-scrappers with more than 5,000 m<sup>2</sup> of floor spaces where 2G, 3G, 4G or WLAN signals need to be boosted.

## Product Feature

- Support multi band signals on 2G, 3G, 4G and wideband/WLAN with a shared net
- Free of link budget
- Simple to install with no need for skilled technicians (reduce CapEx)
- Distributed structure, flexible upgrade, support up to 256 RUs
- Improve the network quality with noise suppression, automatic frequency tracking, automatic calibration for time delay, etc.
- Support remote monitor and firmware update online
- Support POE/ GTTS remote power supply

## Specifications

Item	Mechanics and Other Features
Supporting Protocols	Multi mode 2G +3G +4G+WLAN,support MIMO with 4G
Output Power	23dBm/27dBm
Maximum Gain	35/40dB
Gain Adjustment Range	20dB
Maximum Input	10dBm
System Time Delay	CDMA: ≤ 10us
	WCDMA: ≤ 8us
	LTE: ≤ 7us
Noise Figure	≤ 7dB
Out of Band Gain	Comply with 3Gpp,FCC
Input/Output Intermodulation	Comply with 3Gpp,FCC
Spurious Radiation	Comply with 3Gpp,FCC
VSWR	≤ 1.5
Network Capacity	256 RUs
Monitor	Local: Ethernet
	Remote: SMS & Ethernet

## Mechanics and Other Features

Item	Access Unit (AU)	Extended Unit (EU)	Remote Unit
Power Adaption	90 ~ 240VAC, 50 / 60Hz or -48V ± 20%	90 ~ 240VAC, 50 / 60Hz or -48V ± 20%	POE/GTTS
Installation	Mount against wall or in a machine cabinet		Mount against wall or pole
Size	482 × 393 × 44(mm)	482 × 398 × 88(mm)	304 × 283 × 58(mm)
Weight	4kg	3.5kg	5kg
Operating Temperature	-10°C ~ +45°C		-30°C ~ +55°C
Operating Humidity	≤ 95%		
Storage temperature	-40°C ~ +80°C		

# Industrial Cellular Signal Booster

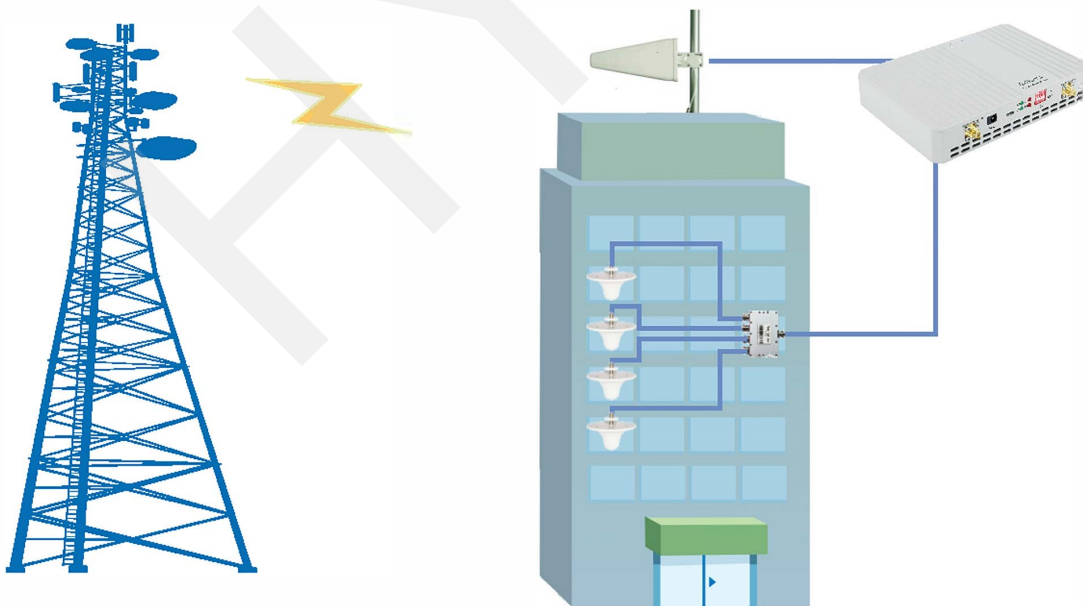


Industrial Cellular Signal Booster receives RF signals with a donor antenna, which feeds the signals through a coaxial cable to the booster, and creates better signal coverage in the room where the booster is placed.

It is an alternative 4G solution to a DAS system at a fraction of the cost. Designed to amplify specific sub band that usually belongs to one specific mobile operator.

## Typical Applications

Wireless signal enhancement in all kinds of indoor locations, including resident houses, elevators, KTV, high rise buildings with a floor space up to 300 m<sup>2</sup> for every single booster, and 2G, 3G and 4G signal enhancement in all types of small areas.



## Product Feature

- Cover up to 8,000 square feet
- Support Band Selection
- Comply with CE
- Complete Network Safety (Auto Isolation Detection & AGC & ALC)
- LED indicators for real-time operation status

## Specifications

Item	Technical Specifications		Note
	Uplink	Downlink	
Technology	GSM / CDMA / WCDMA / LTE		Customized options available
Support Band	B1 or B3 or B8 or B7		Customized options available
Maximum Output Power	17/23 ± 3dBm		
Maximum Input	-10dBm		
Gain	65/70 ± 3dB		
Ripple in-band	≤ 5dB (peak-to-peak value)		
Noise Figure	≤ 5dB		
ALC Range	≥ 20dB		
Gain Adjustment Range	≥ 20dB		
Out of Band Gain	Comply with 3GPP		
Spectrum Emission Mask	Comply with 3GPP		
Input/Output Intermodulation	Comply with 3GPP		
Spurious Radiation	Comply with 3GPP		
Power Supply	17dBm: ≤ 10W		
	23dBm: ≤ 18W		
System Time Delay	≤ 5us		
VSWR	≤ 1.8		
Monitor	USB		
	Remote : SMS(optional)		

## Mechanics and Other Features

Item	Technical Specifications
Power adaption	90~240VAC, 50 / 60Hz
Installation	On Desktop or Mount against wall
Size & Weight	330mm × 215mm × 65mm, 1.8Kg
Operating Temperature	-10°C ~ +45°C
Operating Humidity	≤ 95%
Storage Temperature	-40°C ~ +85°C
Supporting Protection Grade	IP40



# Consumer Cellular Signal Booster

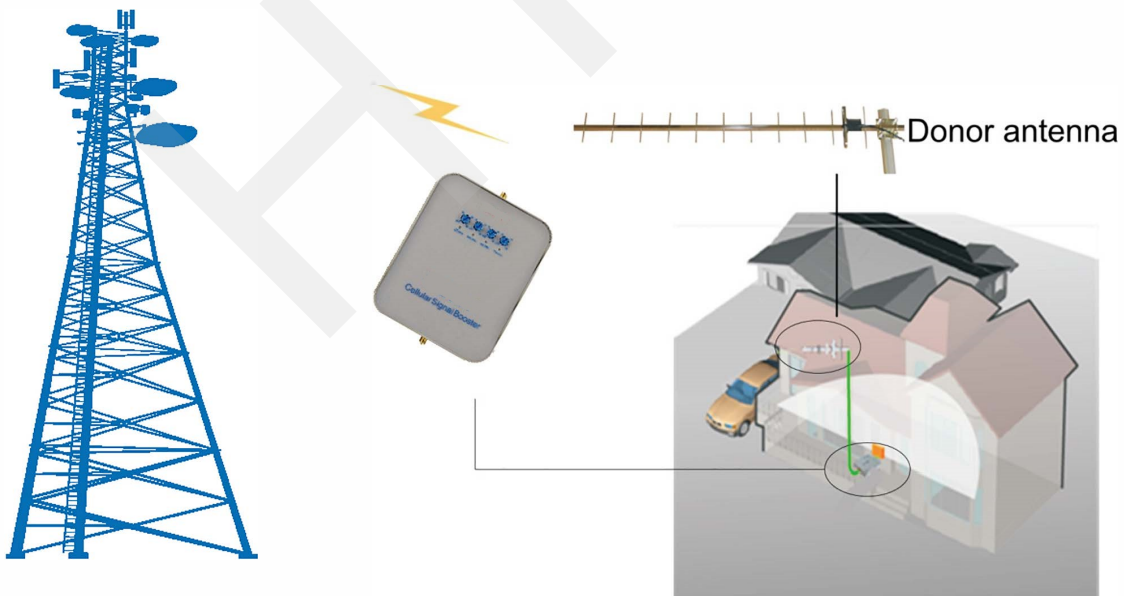


Consumer Cellular Signal Booster receives RF signals with a donor antenna, which feeds the signals through a coaxial cable to the booster, and creates better signal coverage in the room where the booster is placed.

Consumer Cellular Signal Booster is the most efficient solution to solve problems caused by weak cellular signals, including missing calls, dropped calls and slow data speed in home and small offices.

## Typical Applications

Wireless signal enhancement in all kinds of indoor locations, including resident houses, elevators, KTV, high rise buildings with a floor space up to 200 m<sup>2</sup> for every single booster, and 2G, 3G and 4G signal enhancement in all types of small areas.



## Product Feature

- Provide Carrier-Specific and Wideband options.
- Support all carriers.
- Complete Network Safety ( Auto Isolation Detection & AGC & ALC ) .
- Intelligent Installation without specialized skill

## Specifications

Item	Technical Specifications		Note
	Uplink	Downlink	
Technology	GSM / CDMA / WCDMA / LTE		Customized options available
Typical configuration	Provider-Specific: Single Band/Dual-Band/Tri-Band/Quad-Band Wideband: B25+B4+B13+B17+B5		
EIRP	≤30dBm	≤17dBm	
Maximum Input	-10dBm		
Gain	B5: 65dB / B25: 72dB / B17: 63.5dB / B13: 64dB / B4: 71dB		
Ripple in-band	≤5dB (peak-to-peak value)		
Noise Figure	≤5dB		
ALC Range	≥20dB		
Gain Adjustment Range	≥20dB		
Spectrum Emission Mask	Comply with FCC		
Input/Output Intermodulation	Comply with FCC		
Spurious Radiation	Comply with FCC		
System Time Delay	≤1us		
VSWR	≤1.8		

## Mechanics and Other Features

Item	Technical Specifications
Power adaption	90~240VAC, 50 / 60Hz
Installation	Desktop or Mount against wall
Size & Weight	150mm x 113mm x 25mm, 1.1Kg
Operating Temperature	-10°C ~ +45°C
Operating Humidity	≤95%
Storage Temperature	-40°C ~ +85°C
Supporting Protection Grade	IP40

# ICS Cellular Signal Booster for GSM/WCDMA/LTE

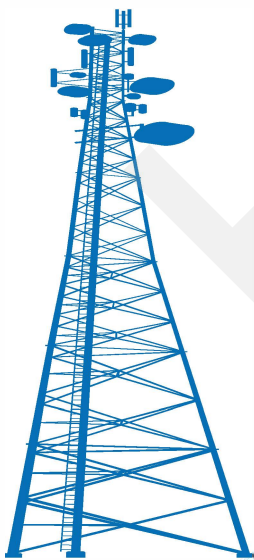


ICS Cellular Signal Booster receives RF signals with a built-in donor antenna, and retransmits the RF signals with a server antenna to cover a room with good signals.

Compared with conventional indoor coverage solutions, ICS Cellular Signal Booster is more convenient to install (Plug and play) and generates better signal coverage in smaller buildings such as residential house and apartments.

## Typical Applications

Wireless signal enhancement in all kinds of indoor locations, including resident houses, elevators, KTV, high rise buildings with a floor space up to 300 m<sup>2</sup> for every single repeater, and 2G, 3G and 4G signal enhancement in all types of small areas.



BTS

ICS Cellular  
Signal Booster



## Product Feature

- Intelligent noise reduction function, without network interference
- Real time isolation monitor, automatic oscillation cancellation
- Built-in donor and service antenna, support Plug & Play
- Support single band in GSM, WCDMA or LTE
- Energy saver

## Technical Specifications

Item	Technical Specifications	
	Uplink	Downlink
Technology	GSM / WCDMA / LTE	
Number of Supporting Channels	GSM: 8 Carriers in 35MHz	
	WCDMA: 1, 2, or 3 Carriers in 20MHz	
	LTE: 5MHz, 10MHz, 15MHz, 20MHz Programmable in 20MHz Pass Band	
Maximum Output Power	13 ± 3dBm	13 ± 3dBm
Gain	70 ± 3dB	
Ripple in-Band	≤3dB (peak-to-peak value)	
Noise Figure	≤5dB	
ALC Range	≥30dB	
Gain Adjustment Range	≥30dB	
Out of Band Gain	Comply with 3Gpp, FCC	
Spectrum Emission Mask	Comply with 3Gpp, FCC	
Echo Interference Cancellation	30dB	
Input/Output Intermodulation	Comply with 3Gpp, FCC	
Spurious Radiation	Comply with 3Gpp, FCC	
Power consumption	10W	
System Time Delay	GSM: ≤ 10us	
	WCDMA: ≤8us	
	LTE: ≤6us	
VSWR	≤1.8	
Monitor	USB	

## Mechanics and Other Features

Item	
Power supply	90~240VAC, 50/60Hz
Installation	Desktop
Size	195mm*164mm*54mm
Weight	1.2kg
Operating Temperature	-30°C ~ +55°C
Operating Humidity	≤95%
Storage Temperature	-40°C ~ +85°C
Supporting Protection Grade	IP30

# Multi-Carrier Power Amplifier (MCPA)

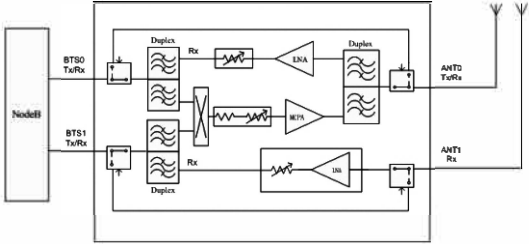
A Multi-Carrier Power Amplifier (MCPA) amplifies, with high linearity, multiple carrier downlink signals from a base station in order to effectively raise the output power of the base station and expand its coverage; the MCPA also amplifies uplink signals with minimum noise to balance the uplink and the downlink loads. Utilizing MCPAs helps to reduce infrastructure cost while improving communication quality.



## Typical Application

MCPA works perfectly for enclosed residential communities, rural areas, open areas like highways, mountains, coast, large lakes, etc. MCPA can also improve the base station carrier frequency utility by combining cells.

## Schematic diagram



## Product feature

- 1.Support single mode 2G, 3G and 4G
- 2.Increase the base station output power by 6~10dB so as to effectively expand the base station coverage
- 3.Automatic shunt to reduce the impact of a failure and facilitate maintenance efforts
- 4.Support diversity reception and amplification
- 5.Support remote monitor and firmware update online

## Specifications

Item	Technical Specifications
Supporting Protocols	Singal mode GSM/CDMA/WCDMA/LTE
Output Power	53dBm
Maximum Gain	15dB
Gain Adjustment Range	20dB
Downlink Maximum Input	46dBm
System Time Delay	CDMA: $\leq 10\mu s$
	WCDMA: $\leq 5\mu s$
	LTE: $\leq 5\mu s$
Noise Figure	$\leq 2\text{dB}$
Out of Band Gain	Comply with 3Gpp, FCC
Input/Output Intermodulation	Comply with 3Gpp, FCC
Spectrum Emission Mask	Comply with 3Gpp, FCC
Spurious Radiation	Comply with 3Gpp, FCC
VSWR	$\leq 1.5$
Shunt Loss	$\leq 1\text{dB}$
Monitor	Local : RS-232 & Ethernet
	Remote : SMS & Ethernet

## Mechanics and Other Features

Item	Parameters
Power Adaption	90~240VAC,50/60Hz or $-48\text{V} \pm 20\%$
Installation	Pole or ground installation
Size	580 × 510 × 230(mm)
Weight	48kg
Operating Temperature	$-30^{\circ}\text{C} \sim +55^{\circ}\text{C}$
Operating Humidity	$\leq 95\%$
Storage temperature	$-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$

# IoT Solution

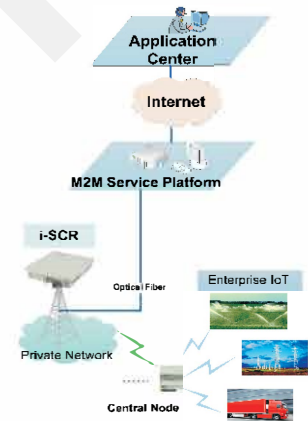


## GeeCube

The GeeCube is designed for small cell products and LTE technology based IoT (Internet of Things) base stations. GeeCube will improve IoT signal coverage and capacity.

## Usages

- Extend LTE coverage and capacity to public enterprise-level outdoor applications, enterprise-level indoor applications and homes, delivering fast and responsive data service.
- Can be easily deployed for temporary LTE coverage in emergencies and short-term events, such as sport games, concerts, or even disaster field.
- Can be used for terminals communication of IoT across a large area, such as power meters, gas meters, Intelligent traffic terminals, or public security terminals, etc.

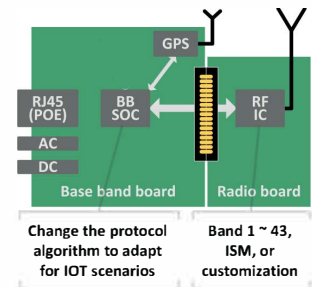


## GeeCube Features

- 3GPP release 10 compliant.
- LTE-TDD / LTE-FDD.
- Radio Frequency Support: band 1 ~ band 43, ISM, or customization.
- Carrier Bandwidth: 1.4, 3, 5, 10, 15 or 20 MHz.
- Maximum Transmission Power: 20mW ~ 3W/customized optional available
- Power Supply: 100 ~ 240V AC, 19V DC, or POE(+).
- GPS and 1588 synchronization.
- eNB and EPC can be placed in a cube box.
- Mounting: Pole, wall, ceiling.

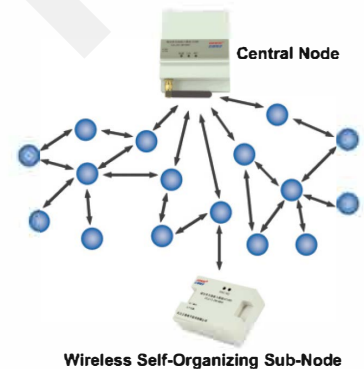
## GeeCube Features

- Platform designed to adapt to all kinds of requirements from customers.
- Different software package on base band board for different IOT scenarios.
- SDR based Radio board to accommodate different radio requirements.



## Usages

HYTT's nod modules can work with regular modems, ADSL modules, 230MHz private network modem, etc., for wireless data backhaul in power grids, city street lighting control systems, sensor control systems and other places. When used in a power grid, the HYTT Central Nodes are usually embedded in power management concentrator on downlink of wireless communication. The China State Grid has deployed a large number of such nodes in its power meter system for wireless collection and communication of meter data. Wireless M-Bus module which can be embedded into such as water, gas and heat meters.



## Technical Parameters

- Frequency range: 433MHz / 470MHz / 868MHz / 915MHz / 2.4GHz
- RX sensitivity:  $-110\text{dBm} \sim -120\text{dBm}$  (with communication speed may be different)
- Modulation: GFSK / MSK
- Max TX power:  $\leq 20\text{dBm}$
- Networking: multi-hop self-organization network
- Maximum relay layers: 7
- Support up to 1023 sub-nodes Network
- Antenna Style: Optional external antenna or sucker rod antenna; Support diversity antenna
- Working environment:  $-40 \sim +70^\circ\text{C}$
- Power supply: 9-15V
- Dimensions: 98mm  $\times$  75mm  $\times$  31mm



# 4-in-1 Meter Reading System Products

## Micropower Wireless Concentrator

### Applications

Concentrator is the center of an automatic meter reading system that is embedded with micro-power wireless local sensor network gateway module (downlink) and LTE or GPRS module (uplink) to support the reading of electricity meter, water meter, heat meter, gas meter and other meters simultaneously in large scale complex resident or commercial residencies.



### Key Parameters

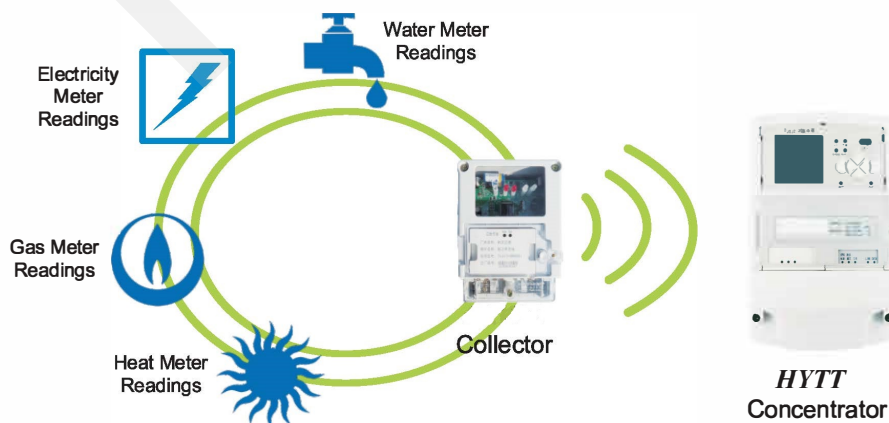
- Frequency range: 433MHz / 470MHz / 868MHz / 915MHz / 2.4GHz or customized
- No. of channels: 30
- Networking: multi-hop self-organizing network
- Time needed for networking:  $\leq 1.5H$  (in a typical application scenario with a network of 1,000 nodes)
- System Capacity:  $\leq 1,024$  nodes
- No. of relays:  $\leq 7$
- Modulation: GFSK/MSK
- TX Power:  $\leq 100mW$
- RX sensitivity:  $-115dBm@19200$  bps, BER= $1.0 \times 10^{-3}$
- Air rate: 19200 bps
- Serial port transmission rate: 1200 ~ 9600bps
- Maximum communication distance: 1,500m
- Data interface: USB, Ethernet, 2 serial ports, infrared port, 2 RS485 ports, GPRS / CDMA interface
- Working power:  $3 \times 220V/380V \pm 20\%$ , 50Hz
- Working temperature:  $-40^{\circ}C \sim 70^{\circ}C$
- Working humidity: 10% ~ 100% RH, No condensation

## Micropower Wireless Collector

This collector is designed with M-BUS, RS485 data bus to work seamlessly with all kinds of electricity meter, water meter, heat meter and gas meter that follow the China State Grid DL / T645-2007, CJ / T188-2004 standards. It collects data from meters and uploads them to the concentrator wirelessly.

### Key Parameters

- Frequency range: 470 – 510MHz
- Modulation: GFSK
- TX Power:  $\leq 100\text{mW}$
- RX sensitivity:  $-116\text{dBm} \sim -120\text{dBm}$  ( with communication speed may be different )
- Air rate: 9600bps
- Infrared transmission rate: 1200bps
- Transmit power consumption: 10mA (220V)
- Working channel: 30
- Networking mode: Multi-hop self-organizing network
- Maximum communication distance: 1500m
- Data interface: Uplink wireless communication, downlink 485 communication
- Working power: 220V Ac
- Working temperature:  $-40^{\circ}\text{C} \sim 75^{\circ}\text{C}$
- Working humidity: 10% ~ 100% RH, No condensation
- Antenna style: Optional external rod antenna or sucker antenna



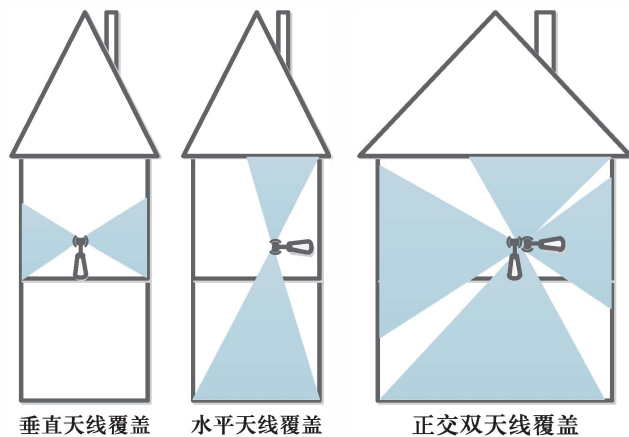
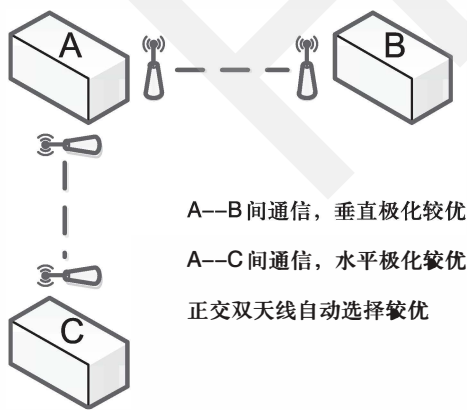
## I型集中器微功率无线本地通信单元

- 网络层级：最大7层，覆盖面积大；
- 1个中心节点最大可管理1024个子节点：容量大；
- 中心节点可设16个中继节点：加强解决覆盖问题；
- 专利组网流程：加快组网速度，保证组网成功率以及稳定性；
- 专利路由算法：路由动态管理，保证路由的可靠性，稳健性；
- 支持现场安装后的网络层次和费控延时结构的展现，为评估、优化提供依据；
- 传输距离远，户外空旷区最大发射距离可达1000m；
- 集中器无线通信单元外置可实现宽带载波+无线的串联双模方式，有效解决地下或偏远配电变压室的中心点至电能表间的无线精准覆盖问题。



## 单相智能电表微功率无线通信单元

- 接受灵敏度-116dBm；
- 智能双天线发明专利的实施可增加立体覆盖强度：



## 产品指标：

- 工作频段：470MHz~510MHz
- 调制方式：GFSK、GMSK
- 空中波特率：默认9.6Kbps；1.2Kbps~19.2Kbps
- 本地串口传输速率：1.2Kbps~9.6Kbps（自适应）
- 发射功率： $\leq 17\text{dBm} / 20\text{dBm}$
- 接收灵敏度： $-116\text{dBm}$ （BER=0.1%，10Kbps）
- 外型尺寸：符合2013年5月发布国网型式规范要求，可根据客户要求定制
- 技术规范：符合2013年5月发布国网技术规范要求，可根据客户要求定制

## II型-无线采集器

### 产品特点：

- 支持本地红外通信，通过手持设备召测电能表电能数据
- 支持参数查询功能，系统可以通过远程命令接口或本地红外接口读取设备硬件版本、ID、抄表参数，电能表地址索引等参数
- 支持在线升级功能和通过手持设备红外通信接口升级功能
- 可作为无线自组网的外置中继节点



### 产品指标：

- 工作频段：470MHz~510MHz
- 调制方式：GFSK、GMSK
- 空中速率：默认10Kbps，1.2Kbps~100Kbps（可定制）
- 发射功率： $\leq 17\text{dBm} / 20\text{dBm} \sim 30\text{dBm}$
- 接收灵敏度： $-116\text{dBm}$ （BER=0.1%，10Kbps）
- 信号电平范围：3.3V TTL电平CMOS兼容
- 空中波特率：默认10Kbps，1.2Kbps~100Kbps（可定制）
- 外形尺寸：符合2013年5月发布国网型式规范要求，亦可根据客户要求定制
- 技术规范：符合2013年5月发布国网技术规范要求，亦可根据客户要求定制