



We are a collaborative team united by a shared mission: to advance private network wireless communication. With product stability as our core principle, we are committed to continuous innovation, research, and development. Our goal is to deliver exceptional value and service to our partners, fostering strong, long-term relationships and achieving win-win success together.

Secure, stable, and efficient communication — no distance is too far

Changbo (Shanghai) Communication Technology Co., LTD

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Changbo (Shanghai) Communication Technology Co., LTD

Manufacturer of Walkie-Talkie System Signal Coverage Equipment

Comprehensive Solutions Provider for Walkie-Talkie Signal Coverage Systems

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Product Introduction

COMPANY PROFILE

Changbo (Shanghai) Communication Technology Co., Ltd. Established in 2002, Changbo is a leading manufacturer specializing in professional wireless communication systems. With a strong emphasis on research and development, the company focuses on the production of high-quality antenna feed equipment tailored for a wide range of communication applications.

Recognized as a National High-Tech Enterprise, Changbo holds ISO9001 Quality Management System and CE certifications, ensuring adherence to international standards in product quality and operational excellence.

Backed by in-house software and hardware R&D teams, Changbo addresses the diverse communication needs of multiple industries. Its product portfolio includes private network solutions such as:

- 88–108 MHz FM broadcasting systems
- 150/350/400/800 MHz VHF/UHF two-way radio systems
- A wide range of supporting equipment including combiners, splitters, duplexers, amplifiers (BDA), fiber optic repeaters, antennas, couplers, filters, and isolators

In addition, Changbo provides customized and OEM services, adapting its solutions to meet the unique regulatory and technical requirements of different countries and regions.

With over a thousand successful engineering projects, Changbo solutions have been widely deployed across various environments such as buildings, tunnels, airports, ports, semiconductor fabrication plants, and chemical plants. The company brings extensive experience in project design and implementation, offering end-to-end technical support and system integration services to its clients.



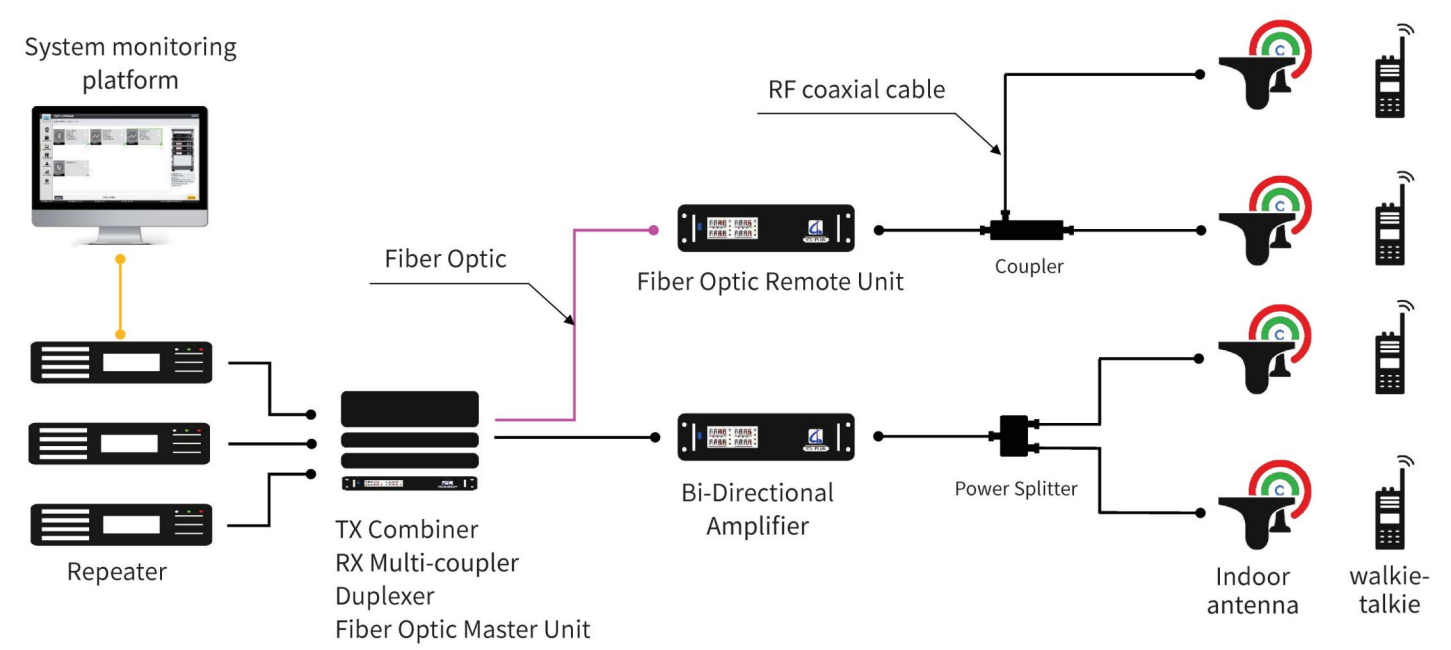


- A 1,500-square-meter production workshop
- Multiple software and hardware R&D teams
- Specializing in the production of testing equipment
- 9001, 14001, 18001, High-tech Certification
- Related product patents and software Copyrights



SYSTEM ARCHITECTURE AND APPLICATION SCENARIOS

System architecture



Application scenarios

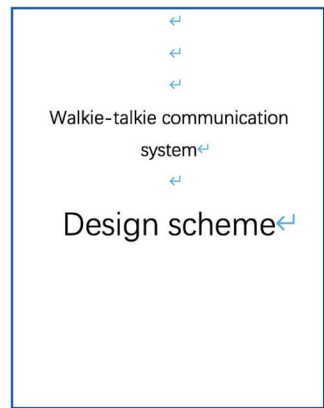


COMPANY SERVICES

Provide project design services



- 20000+ Project design experience
- 8000+ Project product supply
- 1000+ Project implementation experience
- Provide project design and technical consultation



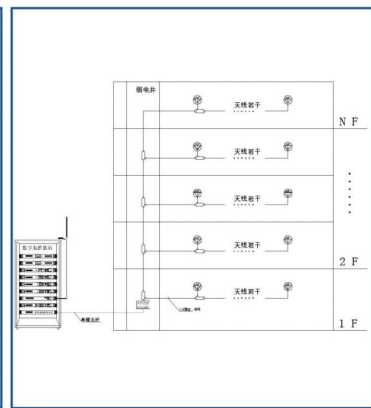
Walkie-talkie communication system

Design scheme

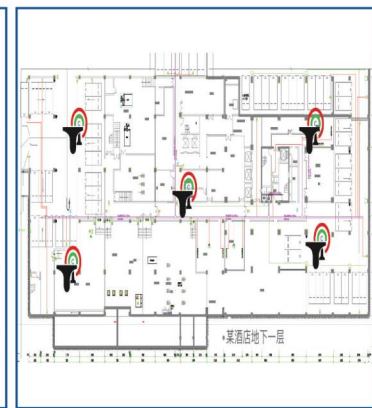
Quotation sheet.xls

序号	项目	品牌	产地	型号	单位	数量	单价	合计
1	数字对讲机	—	—	—	台	20	¥60.00	¥1,200.00
2	无线中继器	中恒	上海	CH-400-2	台	1	¥60.00	¥60.00
3	基站天线	中恒	上海	CH-700-10	台	1	¥60.00	¥60.00
4	馈线	中恒	上海	CH-500-100	米	100	¥0.60	¥60.00
5	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
6	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
7	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
8	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
9	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
10	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
11	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
12	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00
13	馈线接头	中恒	上海	CH-400-1	个	1	¥60.00	¥60.00

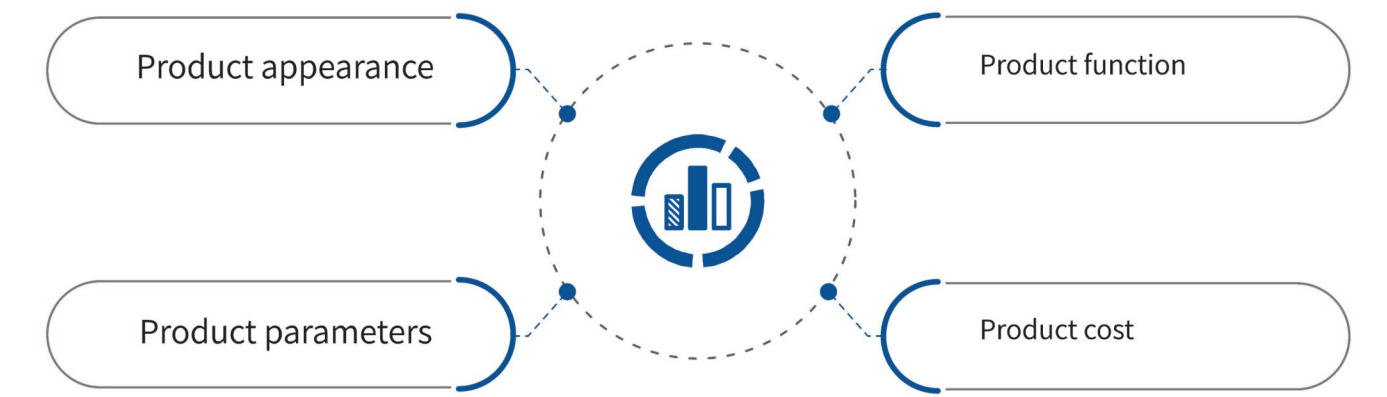
System diagram.dwg



Antenna point map.dwg



Provide product customization services



Technical Support

Changbo Communication provides dedicated technical support as part of its after-sales service. This service assists users in diagnosing and resolving technical issues that may arise during the operation of Changbo systems and products, ensuring optimal performance and user satisfaction.

Partners

Enhance technical capabilities Promote business development Create competitive advantages

Product technology

Product principles, functions, technical indicators, installation, Settings, testing, maintenance and repair, etc

Engineering technology

Surveying, electrical measurement, construction and installation, system commissioning, fault analysis, fault handling, etc

End Users

Understand the product technology Realize the application of the scheme Maximizing product value

Solution

CAD drawing design, system planning, case analysis of different projects, etc

Personalized learning mode

Centralized+regional+customized+remote support

Technical support (Remote)

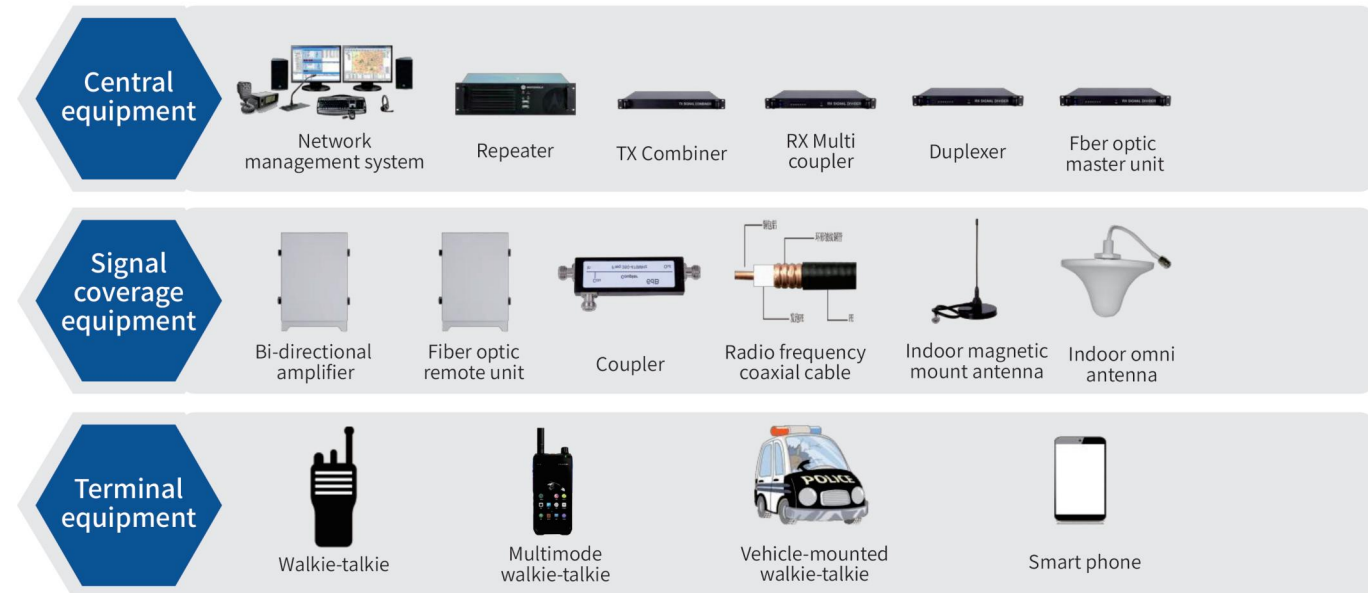
- 7* 24-hour rapid response
- Simple fault location and handling
- Emergency fault solution
- Precise analysis and location of common faults
- Remote technical training support

Technical support (On-Site)

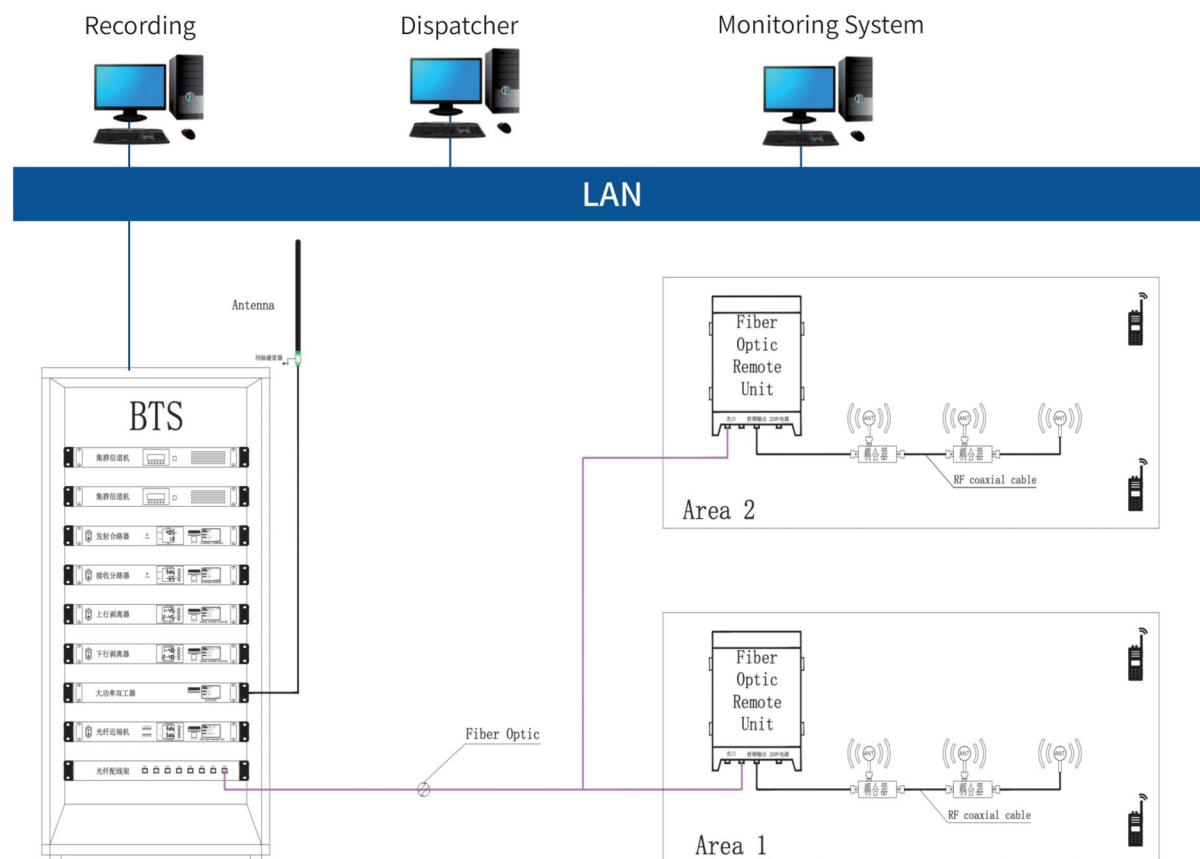
- Provide technical solutions to problems
- Technical guidance, communication and explanation
- Precise analysis and location of difficult faults
- Product and component inspection
- On-site simple technical maintenance
- On-site application technology training

SOLUTION

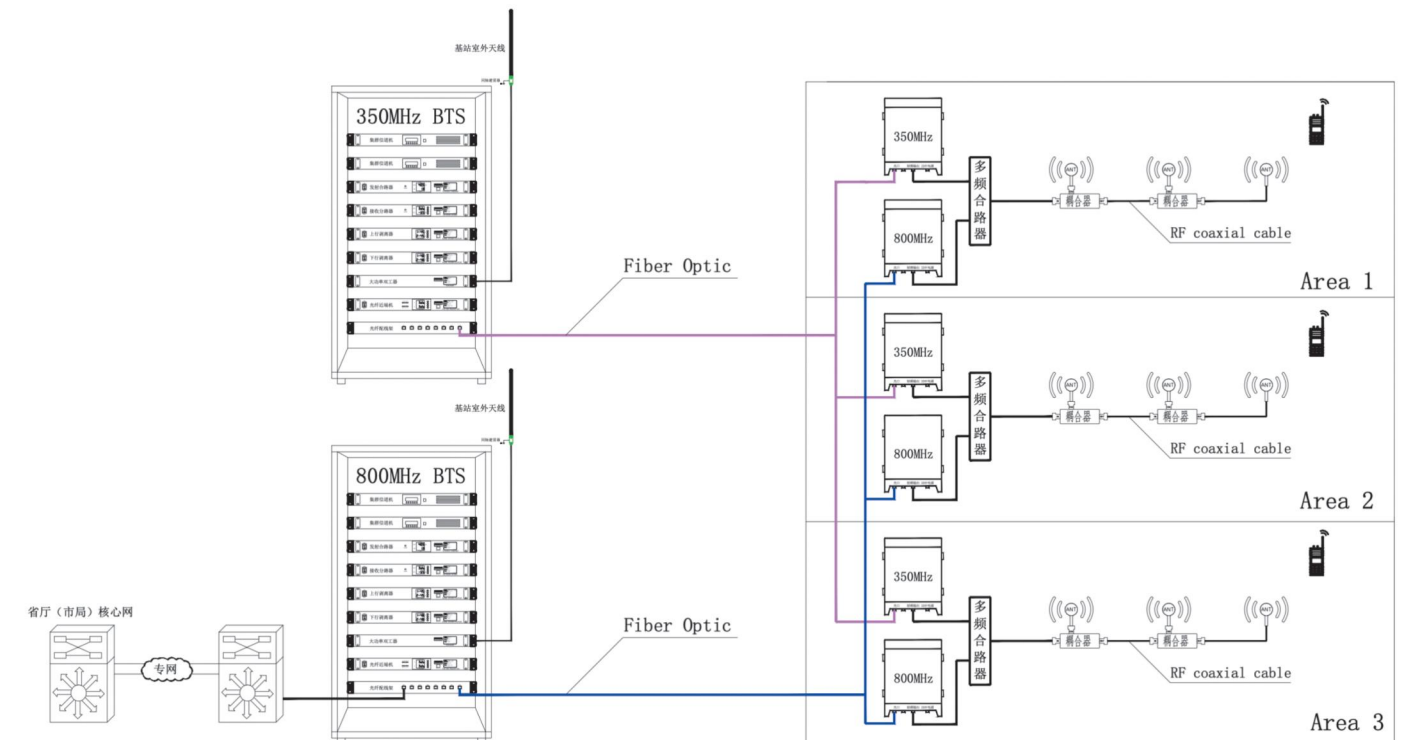
Solution- System architecture



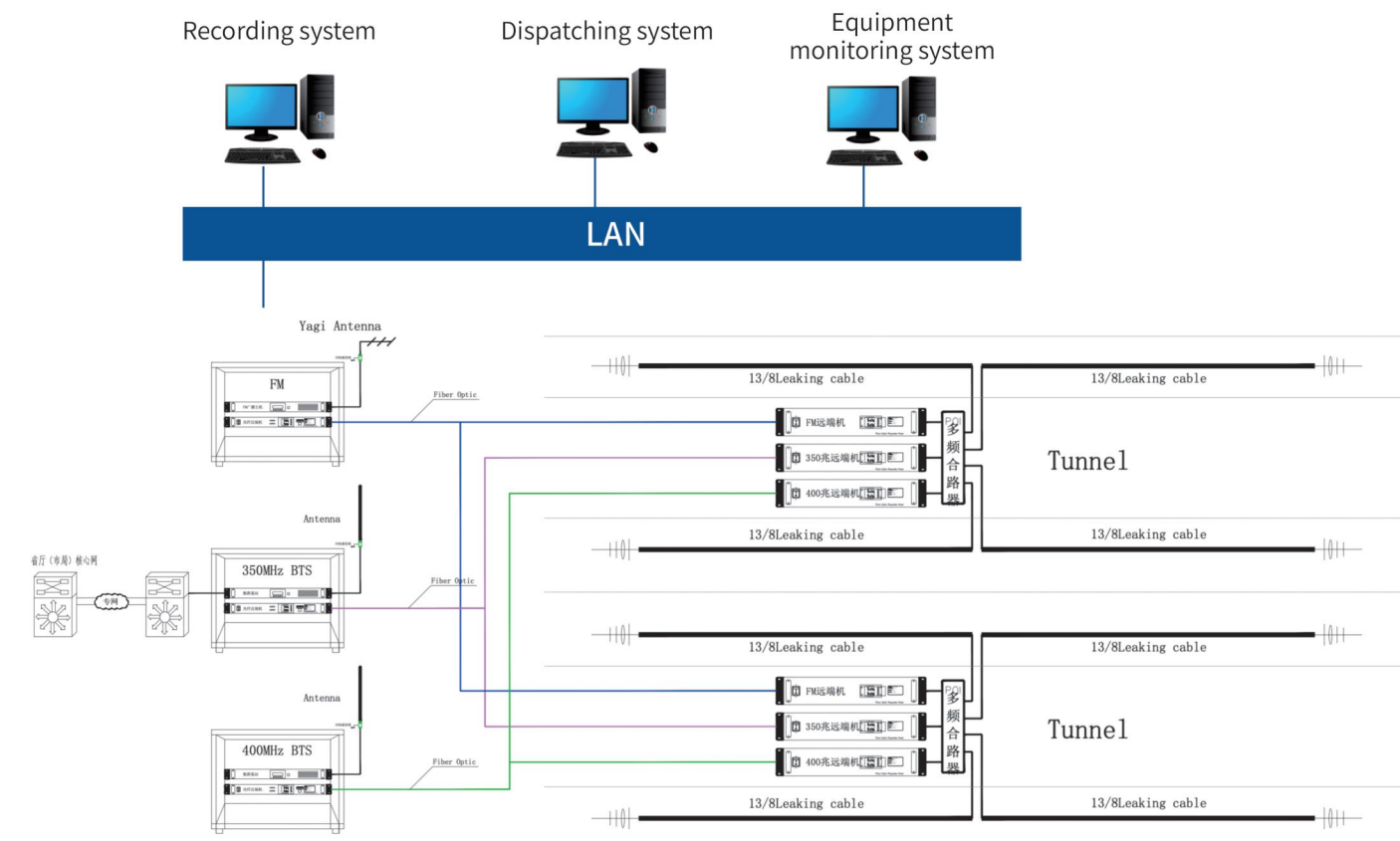
Airport, high-speed railway, factory area, complex, business building, hotel solutions



Multi-Band Antenna Solutions (350MHz and 800MHz)

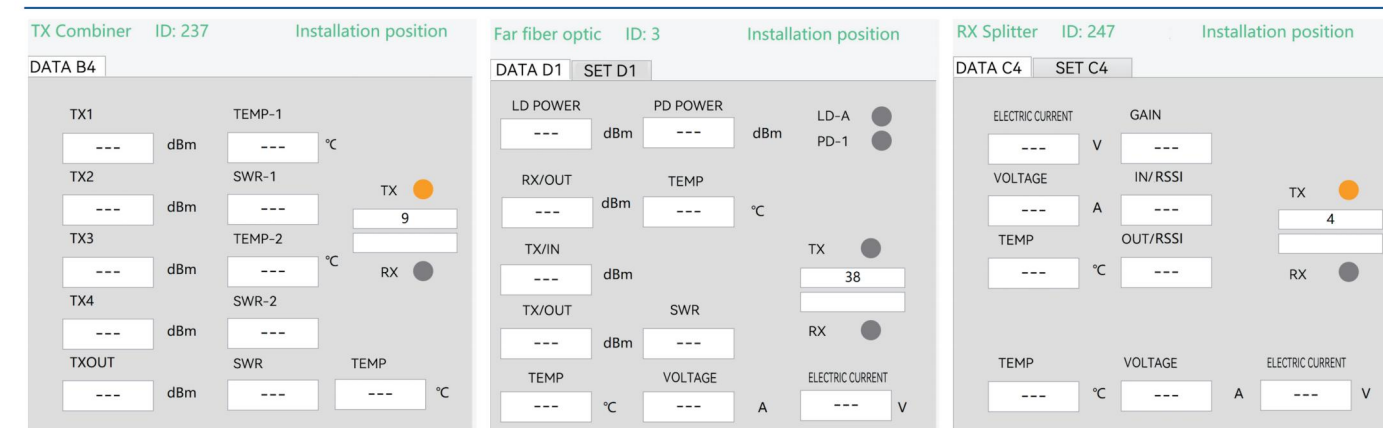
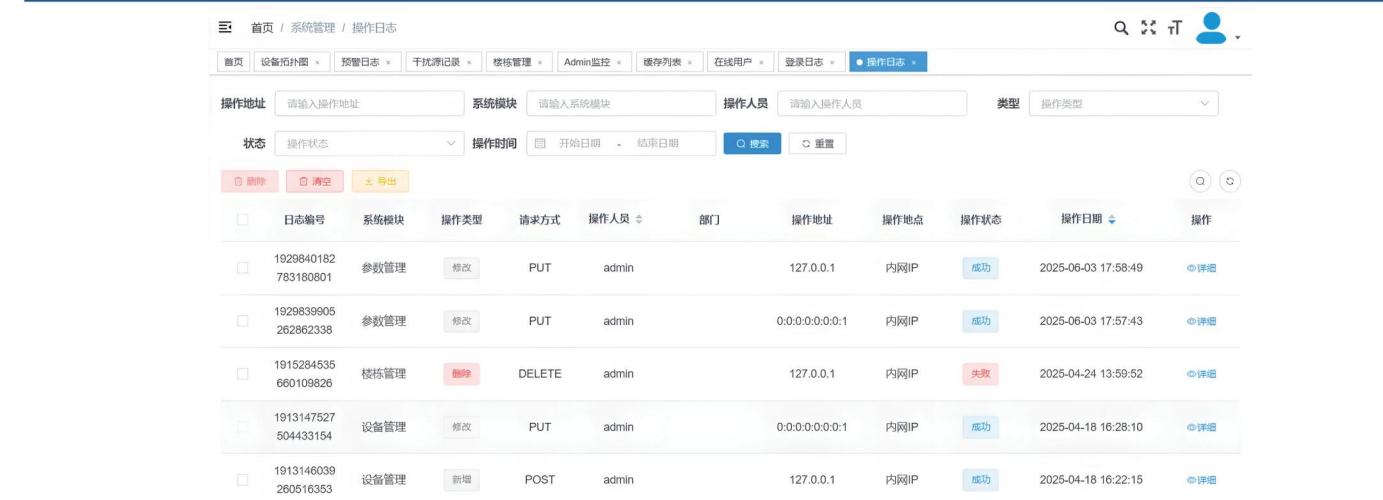


Tunnel multi-system solutions (such as FM radio + fire intercom system + police intercom system)

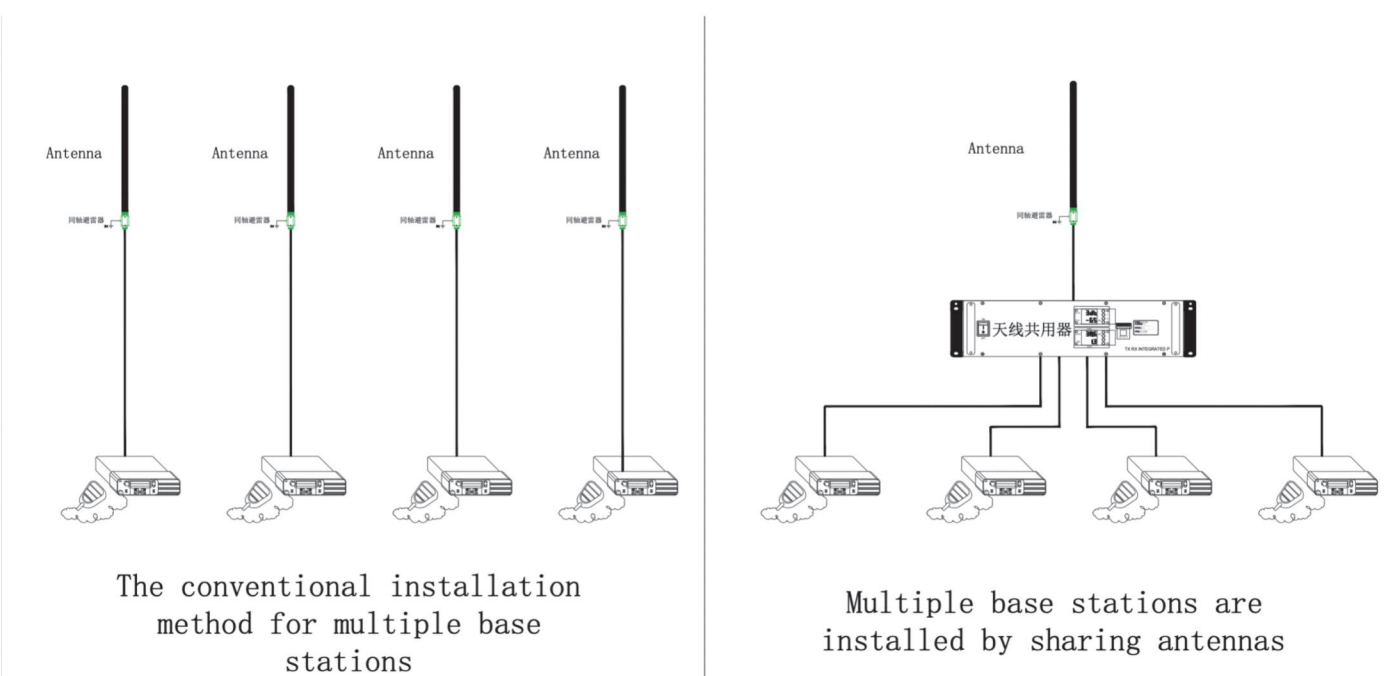


■ Product software solutions

The screenshot shows the 'Communication equipment Management system' interface. On the left is a login form with fields for '用户名' (Username: admin) and '密码' (Password: 7777), and a '登录' (Login) button. The middle sidebar contains a navigation menu with items like '首页' (Home), '设备管理' (Equipment Management), '系统设置' (System Settings), '设备维护' (Equipment Maintenance), '设备故障' (Equipment Fault), '设备报警' (Equipment Alarm), '设备日志' (Equipment Log), and '系统工具' (System Tools). The main area displays a list of equipment with columns for '设备名称' (Equipment Name), '设备型号' (Equipment Model), '设备编号' (Equipment Number), and '设备状态' (Equipment Status). Below this, a detailed view for '近场机_1 (4近场机)' is shown, including its '基本信息' (Basic Information) and '配置参数' (Configuration Parameters).



Changbo offers tailored solutions for installing antennas connected to multiple base stations within command centers. Our approach ensures optimal signal distribution, minimal interference, and seamless integration across systems. By leveraging advanced combiners, duplexers, and filtering technology, we enable efficient space utilization and maintain stable, high-quality communication across all channels.



PROJECT CASE

Industry Experience and Project Achievements

Since its establishment in 2002, Changbo has delivered wireless communication solutions across a wide range of industries, including commercial buildings, energy and petrochemicals, transportation, exhibition venues, precision manufacturing, and more.

With over 9,000 successful project implementations and product deployments, Changbo has earned a strong reputation for reliability, technical expertise, and tailored solutions that meet the complex needs of diverse environments.



Project Name: Zhengzhou Qianxi Square

Industry: Commercial Building

Project Overview: Zhengzhou Qianxi Tower (officially known as Greenland Center · Qianxi Square) is one of the three landmark buildings in the CBD of Zhengzhou's Zhengdong New District. It was developed by Greenland Group with an investment of 2.2 billion yuan and designed by the American SOM Design Firm. The main building is 280 meters high (63 floors) and is known as the "tallest building in Central Plains", with functions including commercial, office, hotel, and sightseeing.

Communication Coverage: Four underground floors, six floors of podium, 63 floors of tower, and a 500-meter range of the square area

System Composition: 4-carrier DMR base station, more than 10 sets of signal amplifiers, over 300 antennas, over 14,000 meters of feeders, and several accessories.

Project Name: Ningbo Zhongqing Cultural Square

Industry: Commercial Buildings

Project Summary: With the goal of "creating a unique new tourism and cultural complex in the Yangtze River Delta region", the total construction area reaches 450,000 square meters. The theme is positioned as a cultural, film and television, tourism, and business complex, mainly including a five-star business hotel, an international luxury theater, top-tier office buildings, a global-style commercial area, a film and television cultural center, etc., making it a gathering center for tourism, leisure, and culture in Ningbo.

Communication Scope: Underground level 2, 10 above-ground buildings, and a 300-meter radius around the square area

System Composition: 4-carrier DMR base stations, over 20 signal amplifiers, over 600 antennas, over 24,000 meters of feeders, and several accessories.



Project Name: Hebei Iron & Steel Group Co., LTD

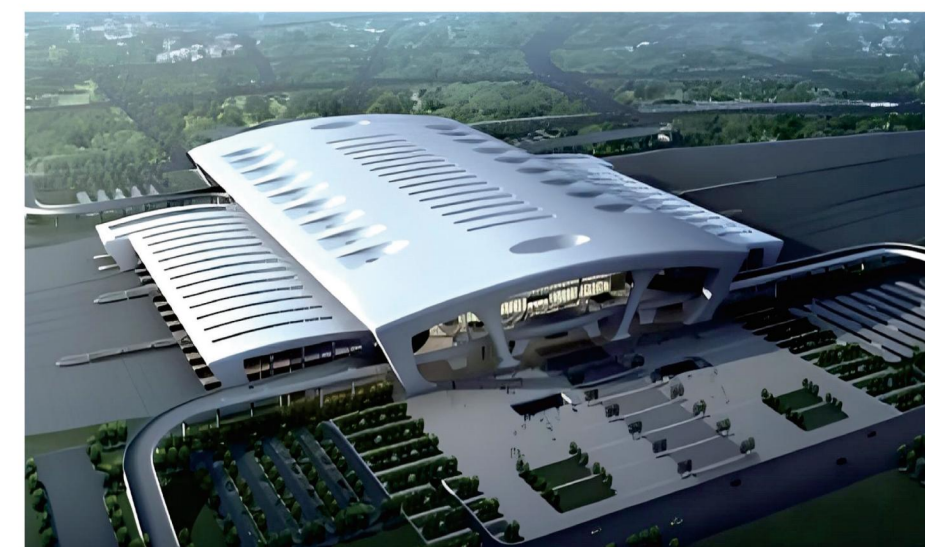
Industry: Energy and Petrochemical

Project Summary: Hebei Iron & Steel Group Co., LTD. (referred to as Hebei Iron & Steel) adheres to the development of "high-end, intelligent and green", vertically extends the steel industry chain towards high-end manufacturing, and horizontally promotes the structural reorganization of similar businesses, accelerating the transformation from "steel to materials and manufacturing to services", and is committed to building the most competitive steel enterprise and becoming a world-renowned brand. A multinational industrial group with coordinated development of steel materials, emerging industries, overseas businesses

and financial services. By the end of 2023, the total assets of Hebei Iron & Steel Group reached 545.6 billion yuan. In 2023, it achieved operating revenue of 401.6 billion yuan and has been listed on the Fortune Global 500 for 16 consecutive years.

Communication range: All device areas, explosion-proof workshops, control rooms, etc. throughout the entire factory

System composition: 24-carrier frequency DMR cluster base stations, over 40 sets of optical fiber Repeaters, more than 1,000 explosion-proof walkie-talkies, and several antenna feeders



Project Name: Hangzhou East Railway Station

Industry: Transportation

Project Summary: Hangzhoudong Railway Station, located within Shangcheng District, Hangzhou City, Zhejiang Province, China, is the transportation hub with the most complete connection functions in Hangzhou. It is an important part of the Hangzhou Railway Hub and one of the major railway hub stations in China. At present, Hangzhou East Railway Station covers an area of 400,000 square meters, and the total construction area of the station building is 320,000 square meters.

Communication range: The entire railway station hall, the east and west underground parking lots, and the supporting commercial areas

System composition: 4-carrier frequency PDT base stations, over 30 sets of optical fiber Repeaters, more than 500 antennas, over 18,000 meters of feeders, and several accessories



Project Name: Yantai Penglai International Airport

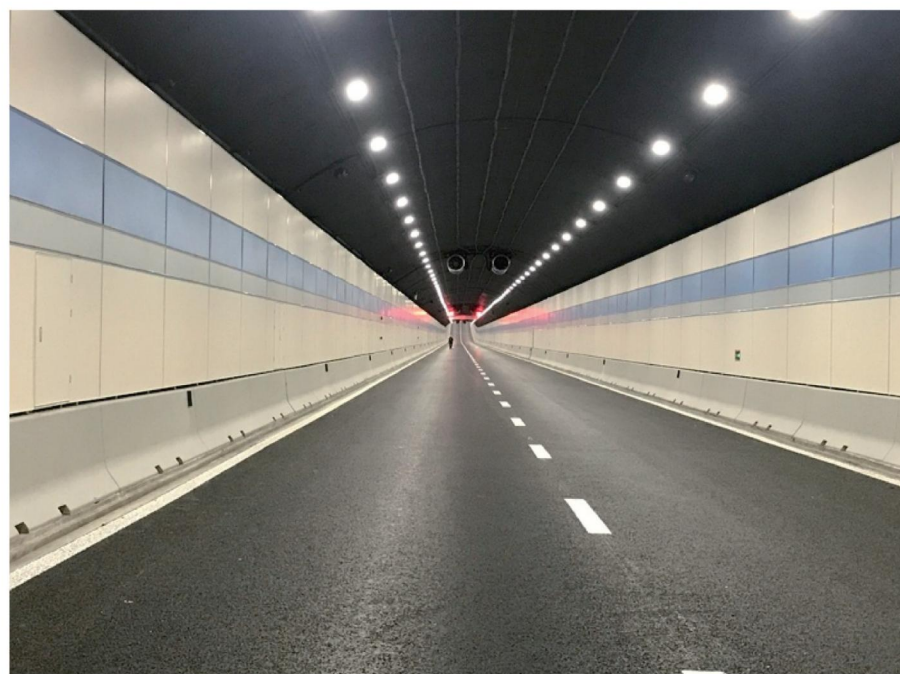
Industry: Transportation

Project Summary: Yantai Penglai International Airport is located at the junction of Chaoshui Town and Daxindian Town in Penglai District, Yantai City, Shandong Province, China. It is approximately 43 kilometers southeast of the city center of Yantai and is a 4E-level international airport. The terminal building of Yantai Penglai International Airport covers an area of approximately 370,000 square meters, and the civil aviation apron has 120 parking stands per month. The runway is 3,400 meters long and 45 meters wide. It can meet the usage demands of 33 million passengers, 200,000 tons of cargo and mail, and 170,000 aircraft take-offs and landings annually.

Communication range: The outdoor area within 8 kilometers of the airport, the interior of Terminal

T1 and Terminal 2, the surrounding supporting machine room buildings, parking lots and other areas

System composition: 8-carrier frequency cluster base stations, over 50 sets of optical fiber Repeaters, more than 500 antennas, over 18,000 meters of feeders, and several accessories



Project Name: A Tunnel in Xiongan New Area

Industry: Transportation

Project Summary: The tunnel is designed with four lanes in both directions, with a total length of 7 kilometers. The comprehensive wireless communication system of the tunnel includes a dedicated dispatching communication subsystem for the tunnel, an FM broadcasting subsystem, and a wireless signal introduction subsystem for fire protection and public security. Among them, the fire protection and public security wireless signal introduction subsystems include the introduction of the public security 350MHZ digital trunking system and the fire protection 350MHZ dedicated wireless communication system. All subsystems share the leaky cable (LCX) transmission system to achieve the purpose of field strength coverage.

Coverage area: The entire area of a 7-kilometer tunnel in both directions

System composition: FM system, public security cluster system, tunnel management

dedicated intercom system, over 40 sets of optical fiber Repeaters, more than 14,000 meters of leaked cables, and several accessories



Project Name: Beijing Bird's Nest National Stadium

Industry: Exhibition, Sports Center

Project Summary: The National Stadium, also known as "Bird's Nest", is located in the southern part of the central area of the Beijing Olympic Park. It was the main stadium of the 2008 Beijing Olympics and hosted the opening and closing ceremonies of the 2008 Summer Olympics and Paralympics, track and field events, and the finals of football matches. As well as the opening and closing ceremonies of the 2022 Winter Olympics and Paralympics. The stadium covers an area of 204,000 square meters, with a construction area of 258,000 square meters. It can accommodate 91,000 spectators, including 80,000 official seats and 11,000 temporary seats.

Communication range: Interior of the venue theme, parking lot, outdoor square area

System composition: 8-carrier frequency PDT cluster base stations, over 20 sets of optical fiber Repeaters, more than 300 antennas, over 12,000 meters of feeders, and several accessories.



Project Name: Yangtze Memory Technologies Co., LTD

Industry: Manufacturing

Project Summary: Yangtze Memory Technologies Co., Ltd. Yangtze Memory Technologies Co., LTD. (abbreviated as "Yangtze Memory Technologies") was established on July 26, 2016, with its headquarters located at No. 88, Future Third Road, East Lake New Technology Development Zone, Wuhan. It mainly engages in technology development and other businesses in the field of semiconductor integrated circuit technology.

Communication scope: Clean workshops, office buildings, substations, sewage treatment workshops and other production workshops as well as outdoor areas of the factory

System composition: 8-carrier frequency DMR cluster base stations, over 60 sets of optical fiber Repeaters, more than 1,200 antennas, over 32,000 meters of feeders, and several accessories.

PRODUCT INTRODUCTION

CAVITY COMBINER

The cavity combiner is mainly used to combine multiple signals into a single distribution system. With components such as high-Q cavities and ring isolators, the out-of-band noise and high-order harmonics of the transmitter can be better suppressed, the purity of the transmitted spectrum can be improved, and losses can be reduced. It is widely used in the combination of base station signals in outdoor large area coverage systems.

Characteristics:

- High power and low loss
- Select and configure the software monitoring version
- Optional fault sound and light alerts
- Optional screen and indicator lights are available to display the device status
- Supports systems such as DMR, DPMR, P25, and PDT



Product Parameter

Description		Technical parameters
Frequency		136-174MHz/350 -390MHz/400 -430MHz/440 -470MHz (Optional other frequencies)
Insertion loss	Two Output	≤3dB
	Three Output	≤3.5dB
	Four Output	≤3.5dB
	Six Output	≤3.5dB
	Eight Output	≤3.5dB
SWR	Input	≤1.2
	output	≤1.4
Channel spacing		≥250KHz
Port Loss		≤0.5dB
Tx to Tx isolation		≥70dB
Ant to Tx isolation		≥50dB
Power Output		≤150W per Channel
Working temperature		-30℃~+60 ℃
Storage temperature		-40℃ to +85 ℃
Working humidity		≤95% RH
Impedance		50Ω
Connector		N-connector (female)
Size		2-way combiner-4U / 4-way combiner-8U / 6-way combiner-12U / 8-way combiner-16U

TX COMBINER

TX Combiner Solution

- The TX combiner is primarily used to combine multiple transmission signals into a unified distribution system, improving efficiency and signal coverage. Changbo's TX combiner utilizes a 3 dB hybrid coupler (bridge) in a co-frequency combining architecture, enabling high-performance signal integration.
- This design allows for continuous sampling of transmission power along a defined direction of the transmission line. It effectively splits an input signal into two outputs with equal amplitude and a 90° phase difference, maximizing output signal utilization and reducing power loss.
- Changbo's TX combiners are widely used in indoor coverage systems to integrate base station signals, making them ideal for high-density communication environments such as office buildings, transportation hubs, and large commercial facilities.

Characteristics

- Modular design is convenient for maintenance
- Select and configure the software monitoring version
- Fault sound and light prompt
- Optional screen and indicator lights are available to display the device status
- Supports systems such as DMR, DPMR, P25, and PDT
- The design of a 1U chassis for 2/3/4 road products
- 5/6/7/8 channel product 2U chassis design



Product Parameter

Description		Technical parameters
Frequency		136-174MHz/350 -390MHz/400 -430MHz/440 -470MHz (Optional other frequencies)
Insertion loss	Two Output	≤4.1dB
	Three Output	≤6.5dB
	Four Output	≤7.5dB
	Six Output	≤9.5dB
	Eight Output	≤11.5dB
SWR	Input	≤1.2
	output	≤1.4
Bandwidth		4MHz
Port Loss		≤0.5dB
Tx to Tx isolation		≥70dB
Ant to Tx isolation		≥50dB
Power Output		≤50W per Channel
Working temperature		-30℃~+60 ℃
Storage temperature		-40℃ to +85 ℃
Working humidity		≤95% RH
Impedance		50Ω
Connector		N-connector (female)
Size		2-4way combiner-1U / 4-8way combiner-2U

RX MULTI COUPLER

RX Multi coupler is a device that uses a single antenna to simultaneously receive signals from multiple channels and distribute the signals to each receiver. It mainly includes; Isolators, wideband low-noise amplifiers, filters and multi-channel distributors. The distributor is equipped with a built-in receiving signal amplifier to compensate for the losses in the antenna feed system.

Characteristics

Purchase low-loss cavity filters to increase out-of-band suppression and isolation.

The modular design makes maintenance convenient

Optimize the noise coefficient without affecting the bottom noise of the base station.

Select and configure the software monitoring version

Optional screen and indicator lights are available to display the device status

Supports systems such as DMR, DPMR, P25, and PDT

2-8 channel splitter 1U chassis design



Product parameter 14

Description	Technical parameters
Frequency	136-174MHz / 330-400MHz / 400-430MHz / 440-470MHz (Optional other frequencies)
Bandwidth	4MHz
Gain	Standard -21~ +10dB adjustable
Noise	≤1.5dB
Input standing wave ratio	≤1.40
Output standing wave ratio	≤1.30
Inner band ripple (P-P)	≤0.5dB
Port in-band ripple (P-P)	≤1.0dB
Insulation	≥23dB
Cross modulation	≥60dBc@ -20dBm
Voltage	12 to 13.8 V DC
Current	≤300mA
Input power	≤10dBm
impedance	50Ω
Connector	N-K connector (female)
Humidity	5% to 95% RH
working temperature	-30℃ to + 60℃
Storage temperature	-40℃ to +85 ℃
size	428x45x360mm (1U)

DUPLEXER

A duplexer is a critical component in interfrequency duplex radio stations and repeaters. Its primary function is to isolate the transmitted and received signals, allowing simultaneous transmission and reception without interference. The duplexer consists of two sets of filters—typically stopband or bandpass filters—tuned to different frequencies. These filters prevent the local transmitted signal from reaching the receiver, thereby preserving receiver sensitivity. In the walkie-talkie industry, a duplexer is also called an antenna sharing device. It must efficiently couple the weak received signals to the receiver while directing the stronger transmitted power to the antenna via the feeder cable. Importantly, it ensures that both functions operate independently and do not interfere with each other.

Characteristics

High Power Handling: Can withstand input power up to 200W with excellent reliability.

Enhanced Performance: Features silver plating and a low-loss cavity design to improve out-of-band suppression and signal isolation.

Optional Software Monitoring: Available with software-based monitoring capabilities for real-time status tracking.

Visual Indicators: Optional screens and indicator lights can be included to display device status clearly.



Specification

Description	Technical parameters
Frequency range	136-174MHz / 330-400MHz / 400-430MHz / 440-470MHz (Optional other
Work bandwidth	VHF: ±1MHz UHF: ±2MHz
Duplex spacing	VHF: 5.7MHz UHF: 10MHz
Maximum Power	200W
Insertion loss	≤1.5dB
Wave in the band	≤0.5dB
Dorsal inhibition(Out of band : ±2.5MHz)	≥45dB
Dorsal inhibition(Out of band : ±5MHz)	≥75dB
insulation(RX-TX band)	≥80dB
Standing-wave ratio	≤1.25
Humidity	5% to 95% RH
working temperature	-30℃ to + 60℃
Storage temperature	-40℃ to +85 ℃
Impedance	50Ω
Connector	N-K connector (female)
Size	1U/2U

BAND REJECTION DUPLEXER

Band Rejection Duplexer Overview

A band rejection duplexer is an essential component in interfrequency duplex radio stations and repeaters. Its primary function is to isolate the transmitted and received signals, ensuring that both transmission and reception can occur simultaneously without interference.

This type of duplexer consists of two sets of resonant cavities, each tuned to a specific frequency band. These cavities effectively suppress the transmitter's signal from leaking into the receiver path, thereby protecting the receiver's sensitivity and ensuring optimal performance.

In the walkie-talkie industry, the duplexer is commonly referred to as an antenna sharing device. It is responsible for coupling weak incoming signals to the receiver, while simultaneously routing high-power transmitted signals to the antenna via the feeder. The duplexer must ensure that both signal paths operate independently and do not interfere with one another.

Characteristics

Low-Loss Cavity Design: Utilizes precision-engineered low-loss cavities to enhance isolation between transmit and receive paths.

Compact Form Factor: Features a space-saving design that is smaller and more lightweight compared to traditional cavity duplexers.

High Stability: Incorporates a copper spiral cavity with temperature compensation to ensure consistent performance across varying environmental conditions.



Specification

Description	Technical parameters
Frequency range	136-174MHz / 330-400MHz / 400-430MHz / 440-470MHz (Optional other frequencies)
Work bandwidth	VHF: $\pm 0.5\text{MHz}$ UHF: $\pm 1\text{MHz}$
Duplex spacing	VHF: 5.7MHz UHF: 10MHz
Maximum Power	50W
Insertion loss	$\leq 1.0\text{dB}$
Wave in the band	$\leq 0.5\text{dB}$
insulation RX-TX band	$\geq 80\text{dB}$
Standing-wave ratio	≤ 1.25
Humidity	5% to 95% RH
working temperature	-30°C to +60°C
Storage temperature	-40°C to +85 °C
Impedance	50Ω
Connector	N-K connector (female)
Size	1U/2U

CUSTOMIZE VARIOUS RF MODULES



DUPLEXER



FILTER



FILTER



FILTER



MULTI FREQUENCY COMBINER



RF PA/LNA MODULE



RF CIRCULATOR



COAXIAL LSOLATOR



DROP-IN LSOLATOR

FIBER DAS SOLUTIONS

Fiber DAS Solutions Overview

Fiber DAS (Distributed Antenna System) solutions consist of three main components: the fiber optic master unit, the optical fiber, and the fiber optic remote unit. Both the master and remote units integrate radio frequency (RF) modules and optical modules to ensure seamless signal transmission and coverage extension.

Downlink Operation:

Signal Input: The RF signal is extracted from the base station and delivered to the fiber optic master unit.

Electro-Optical Conversion: Within the master unit, the RF signal is converted into an optical signal.

Optical Transmission: This optical signal is transmitted through the optical fiber to the fiber optic remote unit.

Signal Amplification & Coverage: The remote unit converts the optical signal back into an RF signal, amplifies it, and transmits it through the distributed antenna system to effectively cover the target area.

Uplink Operation:

The uplink process mirrors the downlink:

The signal from the user device is received by the antenna and routed to the fiber optic remote unit.

It is converted into an optical signal and transmitted back through the optical fiber to the fiber optic master unit.

The master unit converts it back to an electrical RF signal and forwards it to the base station.

Characteristics

Characteristics

High-Performance Duplex Filtering: Utilizes a duplex filter with high isolation and low insertion loss to effectively eliminate crosstalk between uplink and downlink signals.

Low Noise & Excellent Linearity: Engineered for low system noise and high linearity, ensuring no interference with base stations or other wireless equipment.

Long-Distance Transmission: The near and far units are connected via optical fiber, offering long transmission distances, low signal loss, and support for one-to-many networking, providing high flexibility and scalability.

Integrated Intelligent Module: Features a highly integrated and intelligent design, simplifying installation, upgrades, and maintenance.

Software Monitoring (Optional): Available with an optional software monitoring version for real-time system management.

Visual Status Indicators: Optional screens and LED indicators can be included to display system status at a glance.

Multi-System Compatibility: Fully supports mainstream digital communication standards including DMR, dPMR, P25, and PDT.



FIBER OPTIC MASTER UNIT



FIBER OPTIC REMOTE UNIT

Product parameter

Fiber Optic Master Unit	
Description	Technical parameters
Features	Input power detection, gain adjustment, LED display
Operating wavelength	1550 ±20nm;
Number of ports	4
RF bandwidth	VHF: ±1MHz UHF: ±4MHz
Spacing	VHF: 5.7MHz UHF: 10MHz
Intra-band fluctuations	≤1.5dB;
Input port	50 ohm imbalance;
output port	LC
Output optical power	≥5Bm
RF input level	-10~+10dBm
Fiber Optic Remote Unit	
Features	Output power detection, digital display, gain adjustment, remote monitoring, LED lamp power display, support star, chain, ring, mixed networking mode
Frequency range	Frequency customization: 136-174MHz / 330-400MHz / 400-430MHz / 440-470MHz
Maximum output	40 ± 2dBm
Maximum gain	50 ± 5dB
Automatic Level Control Range (ALC)	≥ 10dB
Gain adjustment range	≥ 31 dB
Gain adjustment is linear	damping 10dB ≤±1dB
Dorsal inhibition	Working edge band ± 2 MHz ≤ -40dBc
voltage standing -wave ratio	≤1.5:1
Intra-band fluctuations	≤ 3dB
Noise factor	≤ 5dB
Propagation delay time	≤ 10us
Intermodulation	≤ 36dBm
Band gain	± 50KHz ≤ 75dB ± 75KHz ≤ 70dB ± 125KHz ≤ 65dB ± 250KHz ≤ 38dB ± 500KHz ≤ 32dB
Spurious emissions	9KHZ~1GHZ/100KHZ: ≤ 36dBm
Voltage	220V
Fiber optic interface	LC
Optical reception sensitivity	Extreme value-20 dBm
Humidity	5% to 95% RH
working temperature	-30°C to + 60°C
Storage temperature	-40°C to +85 °C
Impedance	50Ω
Connector	N-K connector (female)
Size	

SIGNAL AMPLIFIER

Signal Amplifier is a device used to boost signal power when it falls below the level required to meet coverage demands. It is typically deployed when the output power of the signal source (such as a microcell) is insufficient to cover the intended area.

Signal amplifiers work by amplifying the source signal, extending coverage and enhancing signal strength across a wider range. They are especially critical in passive indoor distribution systems, where signal loss occurs due to transmission over cables and through splitters or other passive components.

Trunk amplifiers, a common type of signal amplifier, are primarily used in these indoor systems to compensate for power attenuation, ensuring consistent and reliable signal distribution throughout the coverage area.

Characteristics

- **Advanced Filtering Technology:** Features high out-of-band suppression, optimized electromagnetic compatibility design, low noise, low spurious emissions, and minimal in-band fluctuation.
- **Automatic Level Control (ALC):** Equipped with ALC technology, allowing for continuous output level adjustment and automatic amplitude stabilization for consistent signal performance.
- **Low Noise & High Linearity:** Engineered for low system noise and excellent linearity, ensuring no interference with base stations or other wireless devices.
- **Integrated Intelligent Design:** Highly integrated module with intelligent control simplifies installation, maintenance, and future upgrades.
- **Optional Software Monitoring:** Can be configured with a software monitoring version for real-time device management and diagnostics.
- **Visual Status Display:** Optional screen and indicator lights provide clear display of operational status.
- **Broad System Compatibility:** Supports major communication protocols including DMR, dPMR, P25, and PDT.



Specification

Description		Technical parameters
RF bandwidth		VHF: ± 1 MHz UHF: ± 4 MHz
Spacing		VHF: 5.7MHz UHF: 10MHz
TX Maximum output		5/10/20W adjustable
RX Maximum output		-7 ± 3 dBm
TX Maximum input power (no damage)		20 dBm
RX Maximum input power (no damage)		-30 dBm
Gain		19-50dB adjustable
Intra-band fluctuations		≤ 3 dB
Voltage standing-wave ratio		≤ 1.5
time delay		$\leq 1.5\mu$ s
stray emission	Within the operating frequency band	≤ 30 dBm/30kHz
	Outside the working band	9KHz-1GHz: -36dBm/100kHz
		1GHz-12.75GHz: -30dBm/1MHz
Intermodulation attenuation	Within the operating frequency band	≤ 50 dBc/30kHz
	Outside the operating band (2.5MHz away from the operating band)	9kHz-1GHz (including 1GHz): -36dBm/30kHz 1GHz - 12.75GHz: -30dBm/30kHz
Dorsal inhibition	Per frequency band	Working frequency band edge ± 5 MHz: ≥ 70 dBc
		Working frequency band edge ± 10 MHz: ≥ 70 dBc
Humidity		5% to 95% RH
working temperature		-30℃ to + 60℃
Storage temperature		-40℃ to +85 ℃
Impedance		50Ω
Connector		N-K connector (female)
Size		

BI-DIRECTIONAL AMPLIFIER

A Bi-Directional Amplifier (BDA), also known as a wireless co-frequency repeater amplifier, is a linear, frequency-selective repeater that operates in a full-duplex mode on the same frequency band. It is designed to enhance mobile communication coverage by wirelessly receiving, amplifying, and retransmitting signals between the base station and user devices.

Downlink Operation:

The BDA receives the signal from the base station via the donor antenna located in an area with reliable coverage. The signal then undergoes:

- Frequency selection
- Low-noise amplification
- Filtering
- Power amplification

After processing, the amplified signal is transmitted into the target coverage area via the retransmitting antenna.

Uplink Operation:

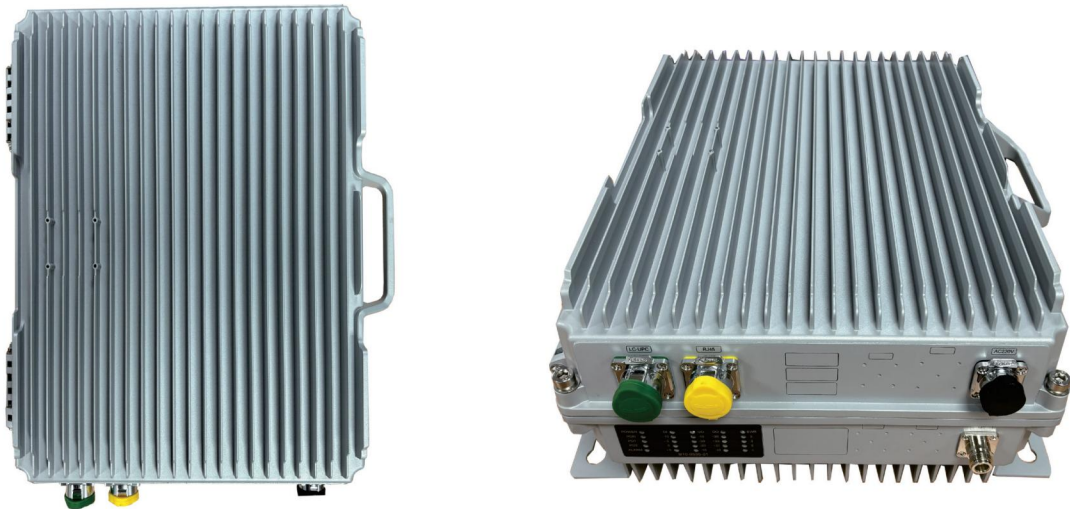
- In the uplink direction, signals originating from within the coverage area are:
- Captured by the retransmitting antenna
- Amplified and processed using the same method as the downlink
- Transmitted back to the base station through the donor antenna

This bidirectional signal flow enables full-duplex communication between base stations and mobile devices such as walkie-talkies.

BDAs are especially suitable for eliminating coverage gaps, such as shadow zones, blind spots, and enclosed indoor areas, where direct signals from the base station cannot reach.

Characteristics

- Advanced Filtering Technology: Features high out-of-band suppression, optimized electromagnetic compatibility design, low noise, low spurious emissions, and minimal in-band fluctuation.
- Automatic Level Control (ALC): Equipped with ALC technology, allowing for continuous output level adjustment and automatic amplitude stabilization for consistent signal performance.
- Low Noise & High Linearity: Engineered for low system noise and excellent linearity, ensuring no interference with base stations or other wireless devices.
- Integrated Intelligent Design: Highly integrated module with intelligent control simplifies installation, maintenance, and future upgrades.



Product parameters

Description		Technical parameters
RF bandwidth		VHF: ± 1 MHz UHF: ± 4 MHz
Spacing		VHF: 5.7MHz UHF: 10MHz
TX Maximum output		1/5/10W adjustable
RX Maximum output		1/5/10W adjustable
TX Maximum input power (no damage)		-10 dBm
RX Maximum input power (no damage)		-10 dBm
Gain		64-95dB adjustable
Intra-band fluctuations		≤ 3 dB
Voltage standing-wave ratio		≤ 1.5
time delay		$\leq 1.5\mu s$
stray emission	Within the operating frequency band	≤ 30 dBm/30kHz
	Outside the working band	9KHz-1GHz: -36dBm/100kHz
		1GHz-12.75GHz: -30dBm/1MHz
Intermodulation attenuation	Within the operating frequency band	≤ 50 dBc/30kHz
	Outside the operating band (2.5MHz away from the operating band)	9kHz-1GHz (including 1GHz): -36dBm/30kHz 1GHz - 12.75GHz: -30dBm/30kHz
Dorsal inhibition	Per frequency band	Working frequency band edge ± 5 MHz: ≥ 70 dBc
		Working frequency band edge ± 10 MHz: ≥ 70 dBc
Humidity		5% to 95% RH
working temperature		-30℃ to +60℃
Storage temperature		-40℃ to +85 ℃
Impedance		50Ω
Connector		N-K connector (female)
Size		

FM BROADCASTING HOST

The FM broadcasting host is designed to receive and process external RF signals from a designated coverage area. After frequency selection, it demodulates the incoming RF signals into audio, then re-modulates the audio onto new RF frequencies for rebroadcast within the coverage area.

These re-transmitted signals can be distributed via:

- Coaxial feeders
- Fiber optic master repeaters
- Fiber Optic remote units
- Or other components within the coverage distribution system

Emergency Broadcast Insertion Function:

A key feature of the FM broadcasting host is its emergency broadcast capability. In critical situations, the system allows the duty officer in the central control room to:

- Manually or automatically interrupt the regular FM broadcast
- Insert emergency audio notifications using software or hardware controls
- During an emergency, vehicles within the coverage area—such as tunnels, expressways, or enclosed spaces—can receive the emergency message via any FM frequency on their in-car radios. Once the emergency broadcast concludes, the system automatically or manually resumes normal FM programming by switching back to the original external signal source.

Emergency Broadcast Function

In emergency situations, the central dispatch platform at the monitoring center can remotely activate the emergency broadcast function. The sequence operates as follows:

- **Signal Override:** Upon receiving a command from the dispatch platform, the FM broadcasting host interrupts the regular FM signal and activates a pre-set emergency voice broadcast. The system forces the emergency broadcast signal into the coverage area, temporarily blocking the normal outdoor FM signal.
- **Live Voice Insertion:** Operators can use a microphone for live announcements. When live voice input is detected, the system automatically disables the pre-recorded alarm tone, allowing only the operator's real-time voice to be heard across the entire coverage area.

Flexible Frequency and Channel Configuration

- * Supports up to 16 frequency selection modes by default (customizable to 24 or 32 frequency points).
- * Supports forced insertion of up to 16 emergency voice channels for different zones or messages.

System Monitoring and Interface Options:

- Comes standard with local monitoring software for system diagnostics and control.
- Equipped with an LED LCD screen for real-time status display.
- Features both built-in voice playback and external audio input interfaces.



Specification

Description	Technical parameters
Specifications	8/16 frequency selection (including tight broadcast insertion)
Frequency range	87-108MHz
Maximum output	0dBm /40dBm adjustable
Maximum input power	-10 dBm
Gain	60dB ±5dB/90dB ±5dB
Intra-band fluctuations	≤2dB
Voltage standing-wave ratio	≤1.5
Intermodulation attenuation	≤40dBc/30kHz
Dorsal inhibition	Working frequency band edge ±5MHz: ≥70dBc
	Working frequency band edge ±10MHz: ≥70dBc
Humidity	5% to 95% RH
working temperature	-30°C to +60°C
Storage temperature	-40°C to +85 °C
Impedance	50Ω
Connector	N-K connector (female)
Size	2.5U

COUPLER/POWER SPLITTER

Coupler and Power Splitter are widely used microwave components in microwave systems. Their primary function is to divide or distribute microwave signals according to specific ratios. Common coupling and power division specifications include 3 dB, 6 dB, 10 dB, and 15 dB, allowing flexible signal distribution tailored to system requirements.



Frequency range	88-108/136 -174/350 -390/400 -470/800 -900MHz
Impedance	50Ω
Standing-wave ratio	≤1.15
Insert loss 6dB/10dB/15dB/20dB	≤1.5/≤1/≤0.5/≤0.1
Insulation	≥20dB
Power capacity	100W
Temperature range	-30℃ to +60℃
Working humidity	-40℃ to +85℃
Size (including joints)	216* 35* 17 mm

Frequency range	88-108/136 -174/350 -390/400 -470/800 -900MHz
Impedance	50Ω
Standing-wave ratio	≤1.3
Insertion loss	≤3.3
Insulation	≥20dB
Power capacity	5/50/100W is optional
Temperature range	-30℃ to +60℃
Working humidity	-40℃ to +85℃
Size (including joints)	



ANTENNA

Outdoor fiberglass reinforced plastic antennas and indoor antennas are designed for transmitting and receiving radio frequency (RF) signals. They come in a wide range of specifications to suit different applications and environments, offering reliable performance for both exterior and interior installations.



Frequency range	350-370/400 -470/800 -900MHz
Impedance	50Ω
standing-wave ratio	≤1.4
gain	2.15dBi
Polarization mode	perpendicular
Lightning protection	DC grounding
wire length	30mm
Resilience	50W
Connector	NK
Size	Rim:165mm in diameter and 140mm in height
	Suction cup:150MHz, diameter 80mm, height 450mm
	Suction cup:400MHz, diameter 80mm, height 200mm
Temperature range	-30℃ to +60℃
Working humidity	-40℃ to +85℃

Frequency range	350-370/400 -470/800 -900MHz
Impedance	50Ω
standing-wave ratio	≤1.4
gain	5/7/11dBi
Polarization mode	perpendicular
Lightning protection	DC grounding
wire length	30mm
Resilience	200W
Connector	NK
Size	1200/2700/4300mm
Temperature range	-30℃ to +60℃
Working humidity	-40℃ to +85℃

