

R-80 DMR Repeater
IP Network Module
NL-001
User Manual

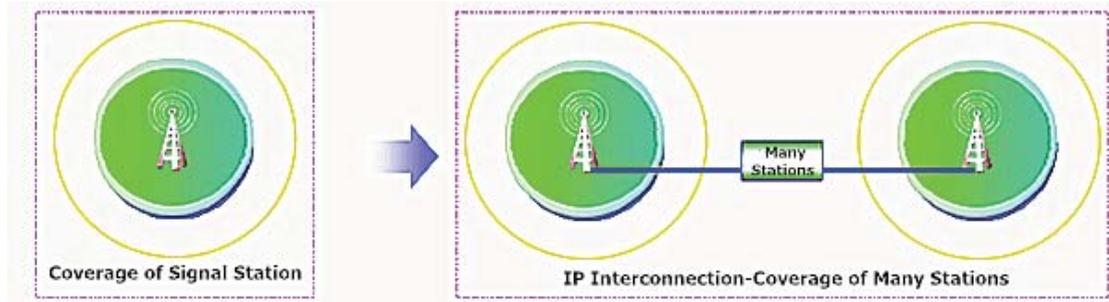
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1. Brief Instruction

IP network module one part of the R-80 DMR repeater, used to expand the R-80 DMR repeater networking capabilities. Through the installation of NL-001 module on R-80, more R-80 DMR repeaters can be connected by the Ethernet based on the TCP / IP protocol to realize the remote IP intercom function and expand the wireless communication coverage.



IP interconnection mode in the process of TCP / IP transmission layer is used in the UDP protocol, DMR protocol is carried by ABELL own transmission protocol in the application layer. At the network layer and the physical link layer, different protocols and equipment can choose to achieve IP interconnection according to the actual needs. Therefore, in the IP Internet, IP interconnection can only be considered to change the DMR transmission medium, DMR protocol business supported by DMR mobile terminal or relay station will not be affected.

The parameters of IP network module can be configured through the remote WEB.

In single station mode or network mode, you can also specify the target device and the target time slot for voice forwarding, as well as change the direction of voice forwarding, to achieve the purpose of grouping and coverage of the dynamic free adjustment.

Here are some application solutions:

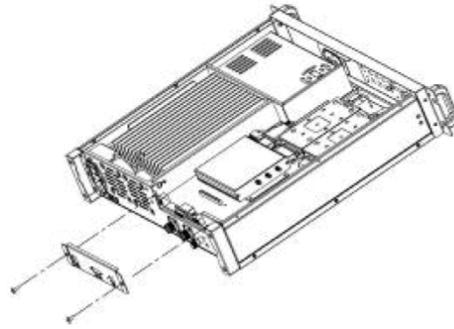
- A. Connect two or more decentralized conventional communication systems to build larger and more efficient communication coverage;
- B. Connect the R-80 repeaters of different bands at the same location or at different locations;
- C. Connect IP-based applications such as dispatchers, manual service agents, voice recording servers, GIS systems, etc. (to be developed).

2. How to Installation

IP networking module plays its network expansion role by being installed on R-80 DMR repeater. To add it to the R-80 DMR repeater, you need to go through the following steps:

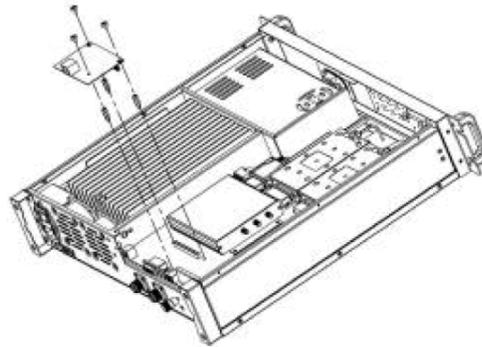
- 1). Turn the R-80 DMR repeater first, open the bottom cover of the chassis, and remove the rear

panel;

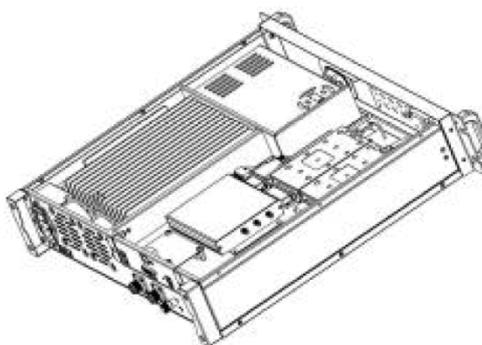
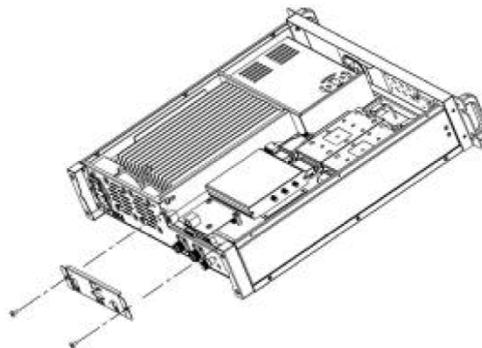


2). Remove the screws from the two ends of the expansion socket on the main board and replace the copper studs attached to the module package and tighten it.

3). Align the IP network module pins with the expansion sockets on the main board, press and lock the screws;



4). Install the new rear panel included with the module package;

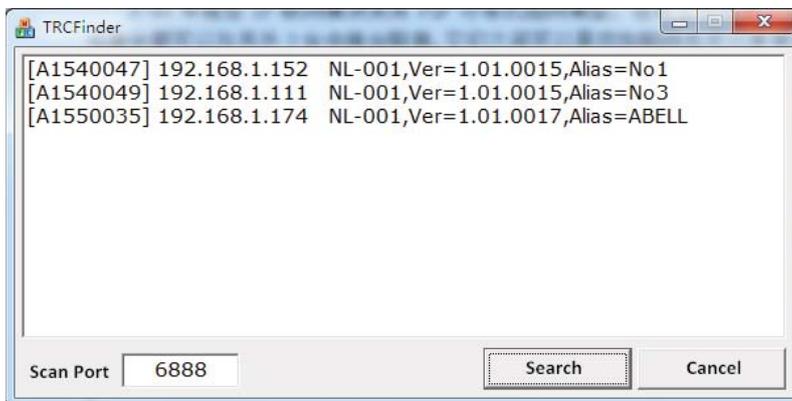


5). Cover the chassis under the bottom cover, and reverse back to the host, then you can test the machine.

3. Parameter Configuration

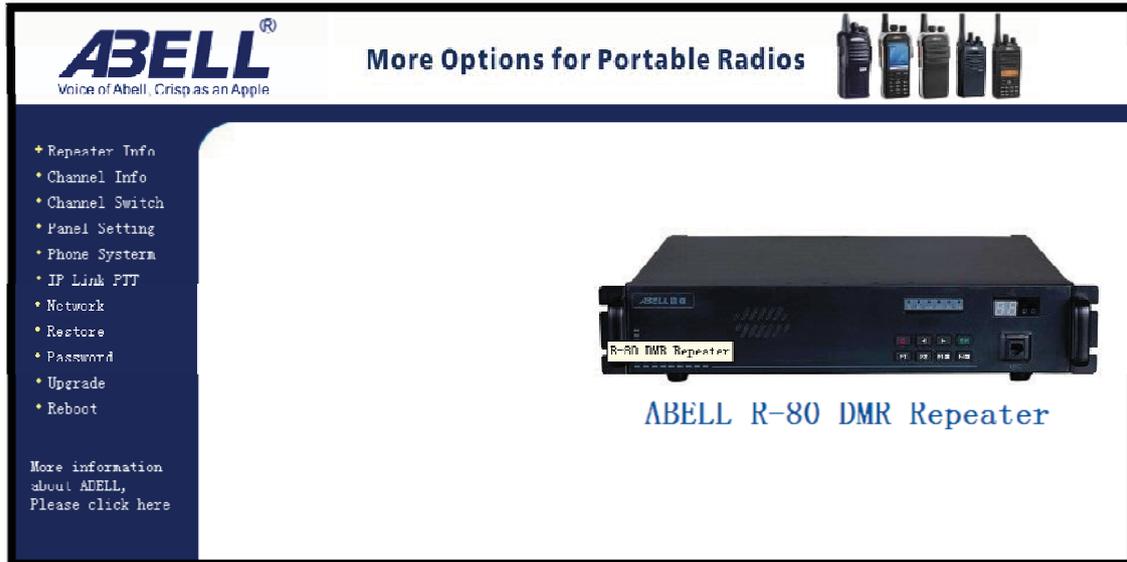
1) Remote WEB Configuration Management

Using the device search software, you can find the R-80 network repeater in the same LAN as the administrator PC.



According to the information listed in the figure, enter the IP address of the repeater you want to configure in the web browser, it will prompt the authentication, enter the correct user name and password to log in to the background configuration management interface of the repeater (Factory default password is admin).





In the R-80 DMR repeater remote configuration management interface, you can view and set the parameters related to the repeater, and control the repeater to switch channels. In addition, you can manage the IP network module remotely to upgrade firmware, configure network parameter, restore factory settings and restart the device and so on.

2) Repeater User Programming System

This system can remotely view the basic information and capability parameters of the device and each unit module.

A. Host Information

Device Information

Name:	<input style="width: 80%;" type="text" value="Get Info Error"/>
Model:	<input style="width: 80%;" type="text"/>
ESN:	<input style="width: 80%;" type="text"/>
Date:	<input style="width: 80%;" type="text"/>
Version:	<input style="width: 80%;" type="text"/>

Specifications

Frequency Range:	<input style="width: 20%;" type="text" value="0"/> - <input style="width: 20%;" type="text" value="0"/> MHz
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In this interface, you can view the R-80 host name, model, electronic serial number, production date, software version and supporting frequency band information.

B. Stimulating Module Information.

TX Module Information

Name:

Model:

ESN:

Date:

Specification

System Support: Analog Digital

Bandwidth Support: 12.5kHz 25kHz

Frequency Range: - MHz

C. RX Module Information.

RX Module Information

Name:

Model:

ESN:

Date:

Specification

System Support: Analog Digital

Bandwidth Support: 12.5kHz 25kHz

Frequency Range: - MHz

D. Power Amplifier Information.

Power Amplifier Module

Name:

Model:

ESN:

Date:

Specification

Power Range: - W

Frequency Range: - MHz

E. Duplexer Module Information.

Duplexer Configuration

Duplexer Status:

Max Power:

Rx Center Frequency: MHz

Tx Center Frequency: MHz

Bandwidth: MHz

F. Channel Parameter Configuration.

Add Channel Info

Enable

Channel:

Type:

RX Frequency: MHz

TX Frequency: MHz

TX Power: W

RX CC:

TX CC:

Hang Time: s

Monitor: Enable

Hand Mic PTT: Enable Only for Digital Mode

Forward PRI: Hand MIC
 Wireless

Hand MIC TOT: s

From the remote WEB interface, you can configure the channel parameter information of the R-80 DMR repeater. You can add channels, delete channels, or modify channel parameters. You can add a digital channel, an analog channel, or a hybrid channel.

Channel Switch Control

Current Working Channel:

Available Channel:

The interface of channel switching control can display the currently active channel and can also control the repeater to switch to other channels that have been added to work.

G. Phone System Parameter Configuration.

Telephone System Configuration

Call Function:	<input type="text" value="Disable"/>	
Inbound Passcode:	<input type="text"/>	(Only for Number 0-9)
Outbound Passcode:	<input type="text"/>	(Only for Number 0-9)
Hang up Code:	<input type="text"/>	(Only for Number 0-9)
Def. Outbound Number:	<input type="text"/>	

H. Other Parameter Configuration.

Host Panel Parameter Configuration

Keyboard Lock:	<input type="text" value="Disable"/>	
Auto Lock:	<input type="text" value="5s"/>	
Password:	<input type="text"/>	6 numbers between 1 to 4, blank for no change
Speaker:	<input type="text" value="Disable"/>	
Volume:	<input type="text" value="Level 1"/>	Higher level, higher volume

3) Network Intercom Configuration

IP networking module using P2P peer-to-peer networking model, no master and slave device points. Each R-80 DMR repeater can be connected to another three repeaters, which can be either a two-way network or a one-way network to forward intercom voice.

Each repeater can choose its own channel voice to forward to the other three destination repeater equipments, and can choose a peer end slot channel as a downlink channel.

Each IP networking module has a unique identifier, which is used for other repeaters access for network configuration.

In the configuration parameters, you need to know the identification code of the peer end repeater, and its IP address and service port number. If the other party is in the same local area network and the IP address can be set as the broadcast address, the system will search to the other side and establish a connection.

IP Link PTT Service Configuration

Link Mode	<input type="text" value="Local Only"/>
My ESN:	<input type="text" value="A150002B"/>
Alias:	<input type="text" value="test"/>
Service Port:	<input type="text" value="6888"/>

Peer 1	
ESM:	<input type="text"/>
IP:	<input type="text"/> Auto Search
Port:	<input type="text" value="6888"/>
Slot 1:	<input type="text" value="To Peer Slot 1"/>
Slot 2:	<input type="text" value="To Peer Slot 2"/>

Peer 2	
ESM:	<input type="text"/>
IP:	<input type="text"/> Auto Search
Port:	<input type="text" value="6888"/>
Slot 1:	<input type="text" value="To Peer Slot 1"/>
Slot 2:	<input type="text" value="To Peer Slot 2"/>

Peer 3	
ESM:	<input type="text"/>
IP:	<input type="text"/> Auto Search
Port:	<input type="text" value="6888"/>
Slot 1:	<input type="text" value="To Peer Slot 1"/>
Slot 2:	<input type="text" value="To Peer Slot 2"/>

4) IP Networking Module Configuration

A. Network Parameter Configuration

Network Configuration

MAC Address: 82-20-13-50-00-2B

Type:

Before selecting DHCP, make sure that the current network has a DHCP server that can be accessed to assign an IP address to your computer. Otherwise, the following default parameters will be used to configure the device.

IP :

Mask:

Gateway:

DNS:

In the network parameter configuration page you can set the address parameters of the networking module in the network. The address type includes static IP address and DHCP dynamic IP address.

If the user chooses a dynamic IP address, it is necessary to ensure that the DHCP server in the network has an IP allocation service. If the device is not available, the device will have to use the default parameters in the following column to configure its address parameters, which may cause conflict with other network equipment and cannot communicate.

When using a static IP address, please make sure that the parameters are correct and cannot conflict with other devices in the network.

B. Restore Factory Defaults

Restore Defaults

Clicking this button will restore the Network Extension Module to the default setting.

The function of restoring factory settings can restore the information in network module to the factory state including network parameters, networking intercom parameters, WEB authentication information and so on.

C. Modify Login Password.

Modify Login Password

Modify system administrator user name and password in this page.

Old User Name:

Old Password:

New User Name:

New Password:

Confirmed:

Factory default user name: admin, password: admin, user name and password can be modified; the length does not exceed 16 characters The English character combination string.

D. Firmware Upgrade

Firmware Upgrade

By upgrading the firmware, you will get new features.
Just for the Network Extension Module.

File:

Firmware Ver: NL-001, Ver=1.01.0021, Date=Jun 16 2017
Hardware Ver: 1.0

Notice: When upgrading, select the firmware that is consistent with the current hardware version. The power can not be off during the upgrading process, otherwise it will cause the equipment to be damaged and can not be used.

Before upgrading the firmware, please make sure that the current hardware version and the software to be upgraded are compatible. If the upgraded software is not correct, the module will not work properly and maybe broken.

The upgrade process will take some time (within 20 seconds). The module will automatically restart after the upgrade, please be patient, not to submit upgrade requests consecutively. Do not power off during the upgrade process.

It is recommended that only latest versions of the software be upgraded higher than the current version.

E. Reboot

Reboot

Click the button below will reboot the Device.

Reboot the Device

Click the button below only reboot the Network Extension Module.

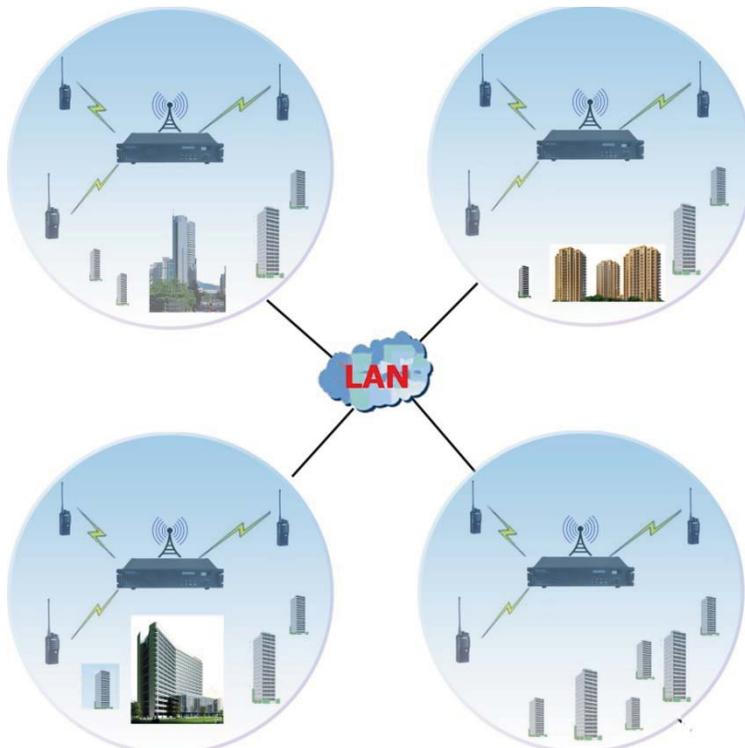
Reboot the Module

You can restart the host or network module.

The "Restart Host Device" button only restarts the R-80 host and the network module will not reboot; "Restart the network module" only to restart the NL-001 network module and the host will not restart. If you want to restart the machine, you need to operate twice, or direct power off to restart. After restart the device, you can make other operations.

4. Network Solution

IP network module using P2P networking model, there is no master-slave device points. Each R-80 DMR repeater can be connected to another three repeaters, which can be either a two-way network or a one-way network to forward intercom voice.



1) Constraints

A. R-80 DMR repeaters connected by IP network must be configured for digital mode.

IP network application is not supported when the current channel mode is analog channel.

B. The IP network mode is constrained by the R-80 DMR repeater configuration.

When the current channel is a digital mode channel, the networking function cannot be used if the networking mode is set to "local single station relay mode" in the network intercom service configuration page. Or the destination device is not set or not set by another device; the device will not be able to use the networking function.

C. IP network mode will be restrained by network type and network equipment configuration.

If two R-80 DMR repeaters are in two separate LANs, and no other network equipment to help them route to each other, it will not be able to use the networking function.

IP Internet can be a proprietary network (LAN) or Ethernet provided by an Ethernet service provider (ISP), and ISPs can provide a lot of technical support.

D. So the IP network requires the following supports:

- a. In the IP Internet, sufficient bandwidth resources must be provided
- b. In the IP internetwork, each repeater must have a static IP address or a DHCP server with IP address assignment on the network, as well as a known UDP service port.
- c. R-80 DMR repeater can be located behind a firewall, router, or NAT, but needs to be configured accordingly.
- d. IP Internet access to the way the WAN cannot use a proxy server, can only use direct IP access

2) Networking Equipment Required

- A. Relay station (R-80 DMR Repeater);
- B. Terminal equipment (A-510T, A-518T and other DMR terminal products);
- C. Network switching equipment;
- D. Routing equipment;
- E. Broadband wireless access equipment;
- F. Cable.

5. Fault Handling

Fault	Possible Causes	Solution
1. No light on front panel of LINK.	The current channel is analog.	Change the current channel to digital.
	The intercom mode is configured as "local single repeater mode".	Modified to "local priority network mode" or "Remote priority network mode".
2. No IP addresses are scanned.	The cable is not connected.	Make sure the network cable is connected properly and the network port indicator light is on.
	No DHCP server in the network.	Make sure that the network has a DHCP server and that the IP of the computer is in the same segment as the repeater's IP.
3. No voices are forwarded.	Network is unavailable, communication cannot be established.	Both devices in the same LAN and the same IP address.
	The slot forwarding settings in the intercom configuration are incorrect.	Make the slot forwarding settings to be correct.

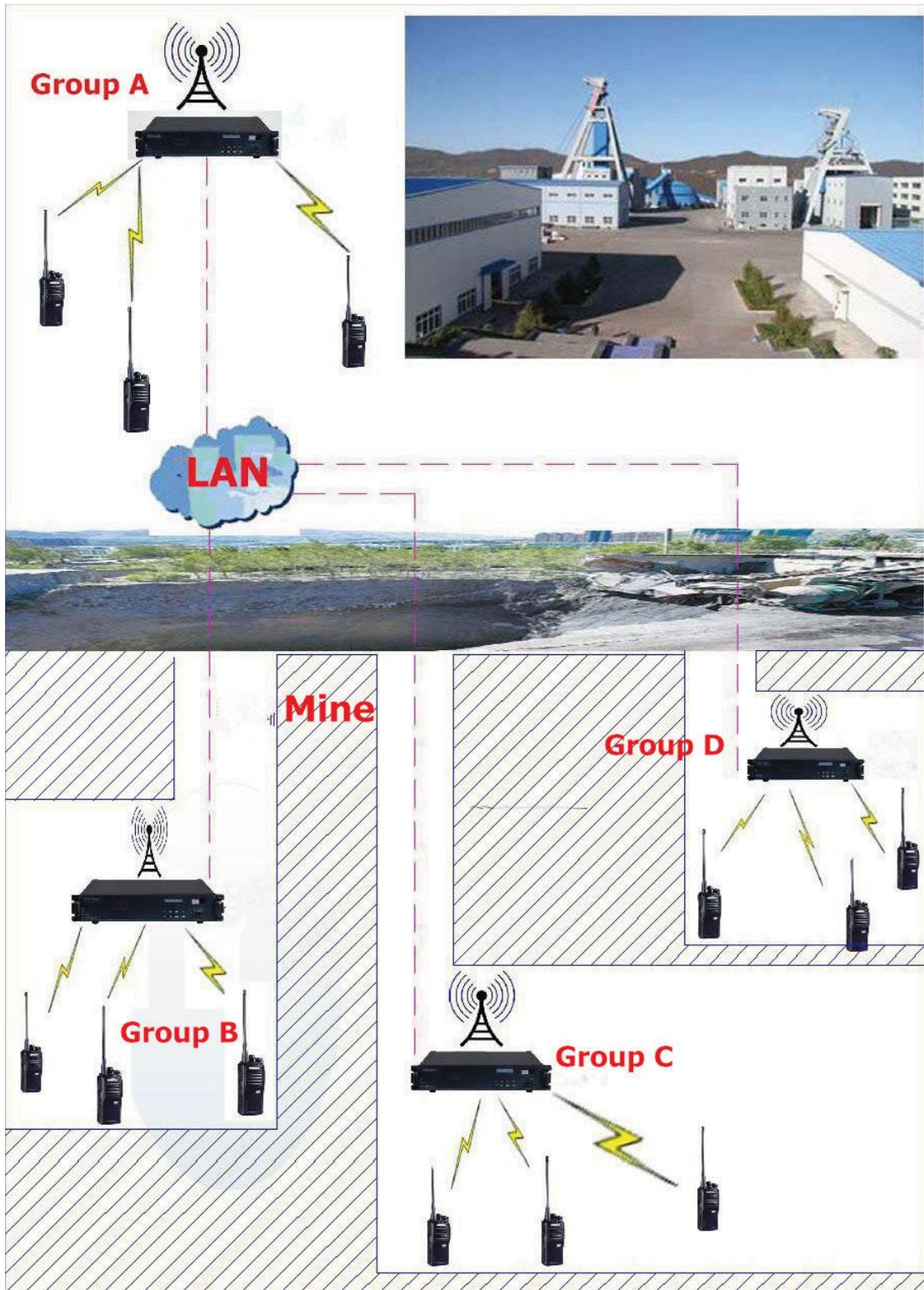
6. Application

1). LAN interconnection

A. Large business building, shopping mall, underground parking: usually the repeater coverage area can't reach the basement; through the IP network you can connect the entire basement with ground floor.

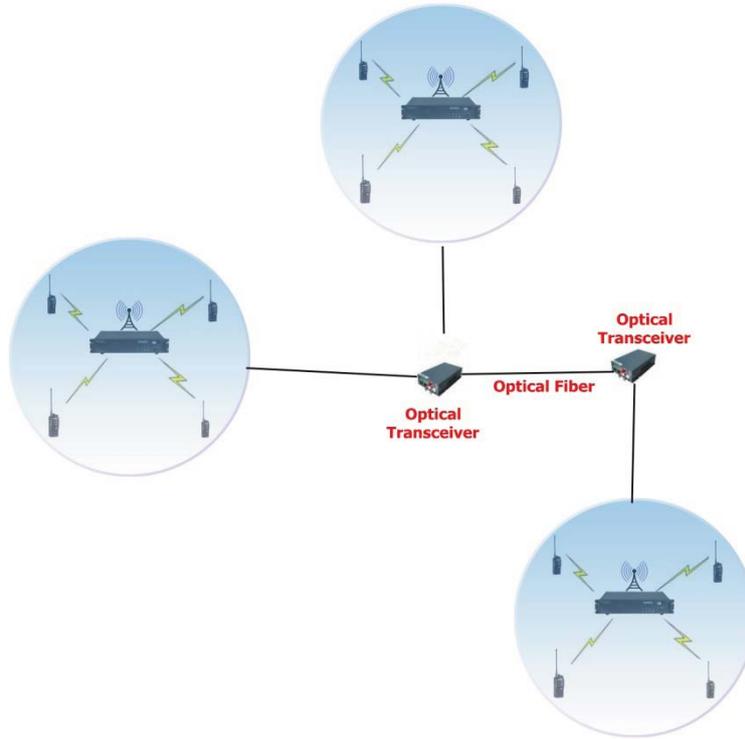


B. Mining enterprises also can through the IP network to realize ground work and underground mine connection at different frequency.



2). Private Network Interconnection System Coverage in Large Area

A. Oil field, mine, forest, and railway tunnel.



B. Forestry, farm.

These areas all have their own private network, through IP network repeater; they can implement the intercommunication at a long-distance.

