R50

Single Frequency Repeater

- Light weight,3.2Kg
- Smart size fast deployment
- ETSI TDMA DMR Protocol
- Bulit-in Power Supply
- No need duplexer
- 2.0-inch color IPS full-view LCD large screen display, soft keyboard operation
- Digital processed voice, clear and loud

Product advantages

Light weight

Only a quarter size of regular repeater, 3.2kg light weight, extremely light.

Further communication distance

Unlike traditional repeaters and low-power small repeaters, the R-50 provides 20W of output power without TX power lose , and the improved RX sensitivity of the whole machine which can reach further communication distance.

Convenient power supply, can be fixed both vehicle and mobile deployment

Built-in high-performance power supply, with 110V ~ 240V power supply, and can automatically switch between DC and AC power supply; also provides 12V power supply interface, easy to use removable battery;

Easy installation

ABELL provides an easy wall-hanging device for the R50. It can be installed on the wall at any time without a fixed chassis; at the same time, it provides a standard antenna interface, does not require a duplexer, and has a built-in power supply; whether it is a tall building, a weak electric well or a tunnel installation, it can achieve fast, convenient and low-cost installation in a simple way.

Support single frequency repeater mode, save frequency resources

Only one frequency is needed, the same frequency can be used to transmit and receive signals to achieve signal relay. It can save frequency resources and reduce the difficulty of applying for frequencies license. At the same time, it also saves frequency usage fees.

Support base station mode

The R50 can choose a palm microphone as optional accessory to support base station mode work.

With temperature power control to achieve super stability

When the repeaters temperature reaches 40 degrees, the built-in fan will automatically turn on; when the base station temperature reaches 70 degrees, the power will be automatically reduced

until the temperature decreases, which will provide guarantee for the high reliability of R50.

Support voice encryption and authentication

It supports signals transferred with AES256 and ARC4 encryption, also the authentication function based on ABELL encryption protocol. It can improve anti-interference performance, can also ensure the information security during communication.

2.0 inch HD large screen display

Using 2.0 inch high-definition full-view IPS screen, the display is clear and delicate, and it's visible in the strong sunlight.

1600 channels, 100 areas supported

Using large-capacity memory unit, 1600 channels can be stored, 100 zones to meet the needs of different users.

Data and audio signal transmit simultaneously

ABELL has developed the digital simultaneous interpretation function for professional users. During the communication, it supports data and audio signal transmit simultaneously.

Signal adaptation

In the single frequency repeater mode, the terminal adopts an adaptive protocol to receive the transferred signal or the terminal's signal automatically.

Individual call and group call supported

Support individual calls and group calls.

Advantages of ABELL single frequency repeater R50

The common repeater	ABELL SFR repeater R50
Big and heavy	Smart size and light
Occupy many frequencies, difficult to apply license	Occupy less frequencies, easy to apply license
Need a pair of frequencies	Need only one frequency
Need of duplexer	No need of duplexer
Difficult to change the frequency temporarily, and small frequency span	70M frequency range, switch frequency freely
Complex and expensive to install	Can be hung on the wall, simple install, saving cost and labor

Single frequency repeater mode : Common mode and SFR Enhance mode

Common mode

In common mode, the portable radio can receive both the signal from the repeater and the signal from the other radios. In this mode, both the radio and the repeater do not have fixed time slots for receiving/transmitting, which means, the repeater receives by slot 1, slot 2 for transferring, receives by slot 2, slot 1 for transferring. The portable radio can talk with the nearest radio without going through the repeater if the portable radio's signal coverage is enough.

SFR Enhance mode

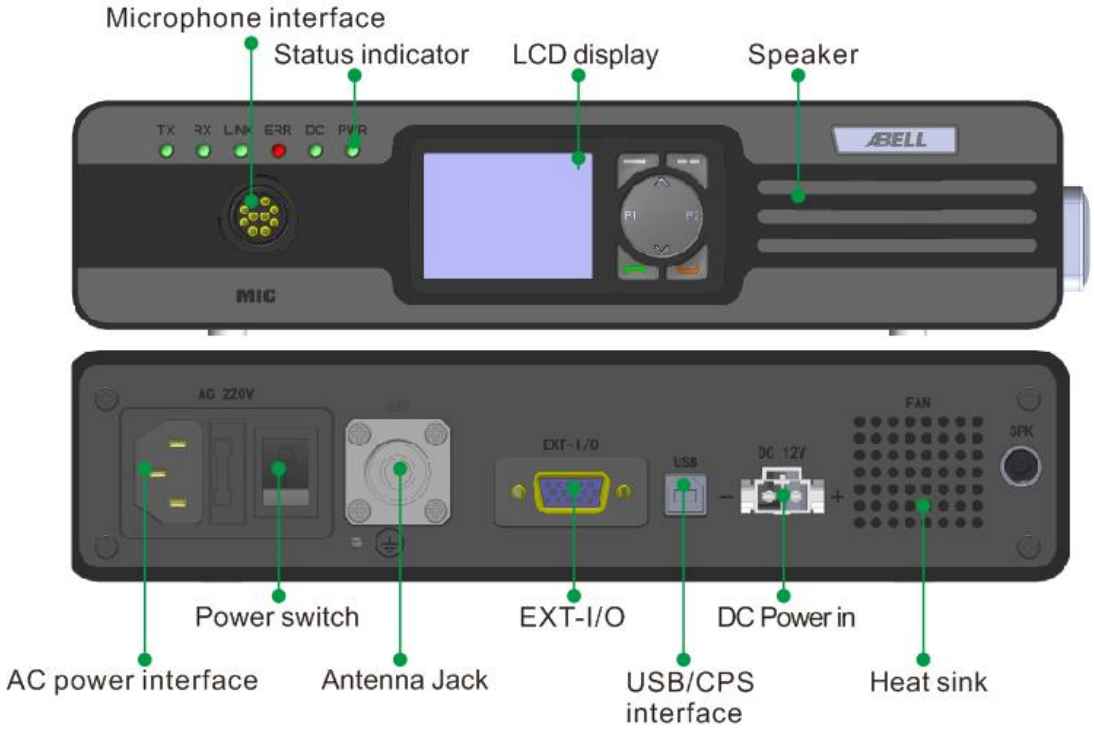
In ABELL SFR enhance mode, all portable radios can only receive the signal from repeater, to ensure the reliability and consistency of calls.

This mode specifies an receiving and transmitting slot for the portable radio, that means, transmitting fixed through slot 1 (or slot 2) and a receiving fixed through slot 2 (or slot 1).

This mode can avoid the problem which radios are in communication without transferring by the single frequency repeater, especially the receiving radio firstly receives the weak signal from the transmitting radio, but does not receive the strong signal from the repeater, causing a part of radios in the same system may not receive the transmitting signal from the repeater.

This mode need portable radio to be supportive.

Highly integrated design



Technical parameters

General Specification	
Frequency Range	UHF: 350-400 MHz, 400-470Mhz,
	450-520 MHz
Number of zones	100
Channel Capacity	1600
Channel Spacing	12.5KHz/25KHz
Working method	Semi-duplex or simplex relay
Operation Voltage	DC 13.8V(±20%); AC 100-240V
Frequency stability	±0.5ppm
Antenna Impedance	50Ω
Dimension	282(L)*241(W)*56(H) mm
Weight	3.2Kg

Transmitter	
Output Power	H:20W L:10W
4FSK Digital modulation	Only data:7K60FXD, data and voice 7K60FXE
FM modulation	12.5 kHz:8K50F3E; 25 kHz:16KΦF3E;
Modulation limitation	±2.5kHz@12.5kHz; ±5.0kHz@25kHz
FM modulation	-40dB@12.5kHz, -45dB@25kHz
Emission spurious	-36 dBm≤1GHz/-30 dBm≥1GHz

Adjacent channel power	≤-60dB/12.5KHz, ≤-70dB/25KHz
Frequency response	+1/-3 dB
Rated Audio Distortion	≤3%
Digital speech coder	AMBE+2™

Receiver	
Digital sensitivity	5% BER:0.225 uV
Analog sensitivity	0.225 uV (12 dB SINAD)
Intermodulation	≥65 dB
Adjacent Channel Selectivity	≥60 dB/12.5KHz, ≥70dB/25KHz
Spurious suppression	≥70 dB
FM noise	-40dB@12.5kHz, -45dB@25kHz
Frequency response	
Rated audio output power	3W(speaker)
Audio Distortion	3%(typical)
Conducted spurs	

Environmental indicators	
Range of working temperature	-30° C~+60 ° C
Storage temperature range	-40° C~+85 ° C
Moisture proof	According to MIL-STD-810C/D/E/F standard
Shock and vibration	According to MIL-STD-810C/D/E/F standard

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two

conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Energy Exposure Awareness and Control Information and Operational Instructions for Occupational Use

Notice: this radio is intended for use in occupational/controlled conditions where users have full knowledge of their exposure and can exercise control over their exposure to meet the occupational limits in FCC and International standards. This radio device is NOT authorized for general population consumer use.

Federal Communication Commission (FCC) Regulations

When DMR Digital Repeater used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirement. Exposure awareness can be facilitated by the use of a product label directing users to specific user awareness information. Your DMR Digital Repeater has a RF Exposure Product Label. Also, your DMR Digital Repeater user manual includes information and operating instructions required to control your RF exposure and satisfy compliance requirements.

Compliance with RF Exposure Standards

Your DMR Digital Repeater is designed and tested to compliance with a number of national and international standards and guidelines for human exposure to radio frequency electromagnetic energy. This radio compliance with the IEEE (FCC) and ICNIRP exposure limits for occupational/controlled RF exposure environments at operating duty factors of up to 50% talk – 50% listen and is approved for occupational use only. In terms of measuring RF energy for compliance with these exposure guidelines, your radio generates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode.

Your DMR Digital Repeater complies with the following RF energy exposure standards and guidelines:

● United States Federal Communications Commission (FCC), Code of Federal Regulations; ● Institute of Electrical and Electronic Engineers (IEEE) C95.1

● International Commission on Non-lionizing Radiation Protection (ICNIRP)

RF Exposure Compliance and Control Guidelines and Operating Instructions for DMR Digital Repeater Operations

To control your exposure and ensure compliance with the occupational/controlled environment exposure limits, always adhere to the following procedures;

● DO NOT remove the RF Exposure Label from the device

● User awareness instructions should accompany device when transferred to other users.

Operational Instructions and Training Guidelines

To ensure optimal performance and compliance with the occupational/controlled environment RF energy exposure limits in the above standards and guidelines, users should transmit no more than 50% of the time and always adhere to the following procedures;

● Gain of antenna must not exceed 5dBi.

● Using only approved supplied or replacement antennas, batteries, and audio accessories, use of non-approved antennas, batteries, and wired or wireless accessories may exceed the applicable RF exposure guidelines (IEEE, ICNIRP or FCC)

● To ensure optimal performance and compliance with the occupational/controlled environment

exposure RF energy exposure limits in the above standards and guidelines, users should transmit no more than 50% of the time and always adhere to the following procedures:

● Mobile antenna Installation: Install the mobile antenna at least 80 cm away from your body in accordance with the requirements of the antenna manufacturer/supplier.

Note: RF exposure decrease with increasing distance from the antenna.