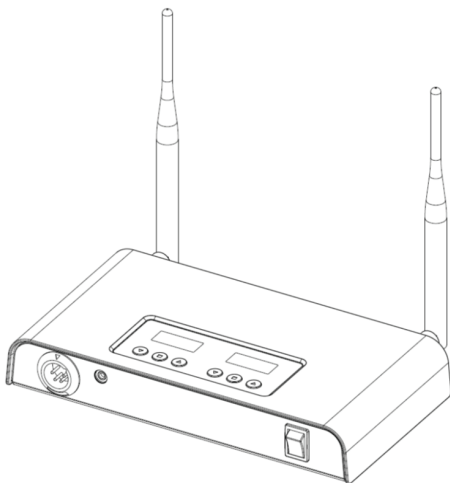# User Manual

MULTICOM REPEATER 900MHz

USER'S MANUAL

(MR-900)

Ver. 1.10

1. General Information

1.1 Introduction

The "Multicom Repeater 900MHz" is designed by using the most advanced Self-Repeating communication technology. It serves user-friendly features and also extremely convenient to expand the communicating coverage of Multicom.

It gives expanding of communicating coverage around 2.1km~3.0km typically by consist of 2 Repeaters with up to 8 users multiplex communication excluding Reprater itself.

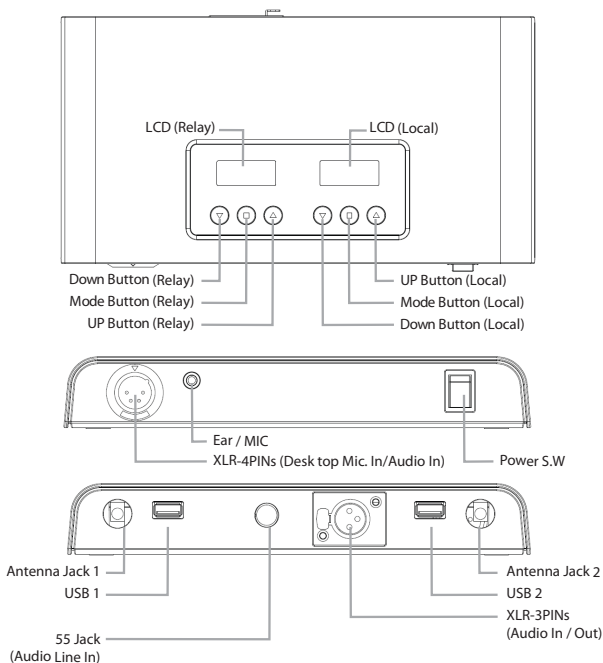Furthermore, it is available to expand the talk range by cable connection between Repeater.

In this case, the talk range is dependant on the cable length and maximum available handsets are 16 units in full duplex excluding Repeater itself.

It is recommendable you read the user's manual thoroughly to enjoy its maximized performance and features this repeater has to offer.

1.2 Main Features

* Long distance communication coverage over 2.1km ~ 3.0km typically
* 39 different Group communicating selection per Repeater
* Audio output HI/Low selection
* Audio volume control with 9 steps
* Side tone On/Off selection
* Direct microphone sensitivity control with 5 steps
* Convenient USB power source for the purpose of its portable using by connection Mobile phone Power bank into it or DC 5.0V adapter via AC input
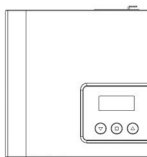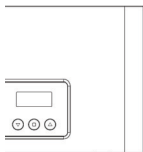
2. Controls and Indicators

LCD (Relay) — LCD (Local)

Down Button (Relay) — UP Button (Local)
Mode Button (Relay) — Mode Button (Local)
UP Button (Relay) — Down Button (Local)

Ear / MIC
XLR-4PINs (Desk top Mic. In/Audio In) — Power S.W

Antenna Jack 1 — Antenna Jack 2
USB 1 — USB 2
55 Jack (Audio Line In) — XLR-3PINs (Audio In / Out)

Power S.W	Upward : Power Turn ON / Downward : Power Turn OFF
Mode Button	Selection of Group Number, Device ID, Side Tone On/Off, Mute Mode, Microphone Sensitivity level and Audio Output Loud
Up Button	Control to be Up the level in the selected mode
Down Button	Control to be Down the level in the selected mode
EAR/MIC	3.5mm External Headset Boom Microphone Jack(EHR-01)
XLR-4PINs	XLR Headset Jack (Mic In / Audio In)
Antenna Jack	Long diversity Antenna Jack
USB	USB Jack. compatible with Power Bank for mobile phones
55 JACK	55 Jack Audio Line In
XLR-3PINs	XLR Jack Audio In / Out

3. How to use

The Multicom Repeater is consist of two parts, Relay part for repeating between repeaters - Left side LCD and Local Communication part for communicating between Repeater and its belonging up to 4 Multicom handsets - Right side LCD.

Left side LCD
- Relay part

Right side LCD
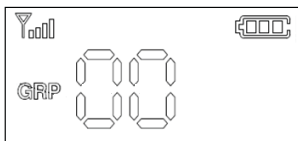- Local Communication part
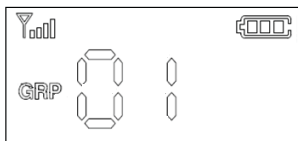
3.1 Relay Part

1) Power On/Off

Press the "Power S.W" switch to the upward to turn the stationary power on.
The LCD display is on and shows the default volume level with "VOL 03".
If you pressed the "Power S.W" to the downward, the stationary power is turned off.

2) Group selection

Press and hold the "Mode" button longer than 3 seconds after turn the device power on. The "GRP" symbol on the LCD is blinking. Select the Group number 0~2 as you desire by press "▲" or "▼" button and then release all the buttons longer than 5 seconds to fix it.

Show the selected Group Number "00"

Show the selected Group Number "01"

Note; It is required to have the same group number between the repeaters you want to relay the communication consecutively in a relay system and also keep a distance longer than 10m between repeaters.
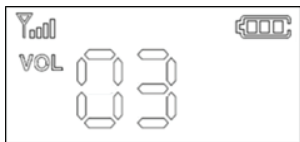
3.2 Local Communication part

1) Power On/Off
Press the "Power S.W" switch to the upward to turn the stationary power on.
The LCD display is on and shows the default volume level with "VOL 03".
If you pressed the "Power S.W" to the downward, the stationary power is turned off.

2) Volume Up / Down
It gives you to adjust the hearing volume level with 9 steps as per you prefer.
Press "▲" button to control volume up and "▼" button for volume down after turn the device power on.
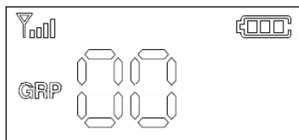It is available to adjust the volume level 0~9 from low to high.

Note; The default volume level is 3 and the volume level returns to 3 all the times whenever you power switch turned off and on.
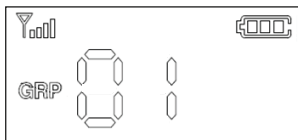
3) Group selection
Press and hold the "Mode" button longer than 3 seconds after turn the device power on. The "GRP" symbol on the LCD is blinking. Select the Group number 0~39 as you desire by press "▲" or "▼" button and then release all the buttons longer than 5 seconds to fix it.
Every radio needs to have a same Group number to communicate each other in a group.

Show the selected Group Number "00"

Show the selected Group Number "01"

4) ID selection

In a group, every Multicom devices needs to have each different ID per device from "00" to "99".
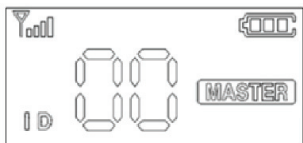
The ID "00" becomes a master device in a group and every group needs to have a master device with ID "00" per group without alternative. The "MASTER" is displaying on the LCD as soon as the ID "00" is set.

Press and hold the "Mode" button longer than 3 seconds after turn the device power on. The "GRP" symbol on the LCD is blinking.

And press the "Mode" button one more time instantly.

The "ID" symbol on the LCD is blinking.

Select the ID number to "00" per Repeater by press "▲" or "▼" button so that every Repeater becomes a master station in a group and release all the buttons longer than 5 seconds to fix it.
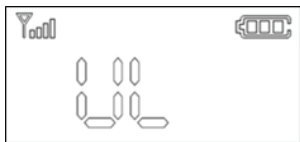

And Multicom handsets who belong to the Repeater station need to tune the same group number as the Repeater has and set every different ID from "01" to "99" per Multicom handset in a local communication group.

5) Audio Output mode High / Low

It serves you to choose higher audio output or lower beside of Volume Up / Down. The higher audio output is effective when you listen to the device at the heavy noise place. Press and hold the "Mode" button longer than 3 seconds after turn the device power on.

The "GRP" is blinking on the LCD. Press the "Mode" button 6 times instantly. Select either "UH" for higher audio output or "UL" for lower audio output by press "▲" or "▼" button and then release all the buttons longer than 5 seconds to fix it.

Normal Audio Output mode

Loud Audio Output mode

Note; 5.1) Its default setting is "UL".

    5.2) There might be a kind of white noise creation when you set the audio output at "UH".

    Hence, it is recommendable to set the audio output at "UL" except using the device at the heavy noise surround place.

6) Microphone sensitivity level control

It is available to select the microphone sensitivity up to 5 steps according to the environment you have. Press and hold the "Mode" button longer than 3 seconds after turn the device power on.

The "GRP" is blinking on the LCD. Press the "Mode" button 5 times instantly. Select the microphone sensitivity level 1 ~ 5 as per you desire by press "▲" or "▼" button and then release all the buttons longer than 5 seconds to fix it.

Note; 6.1) The "C 1" is the lowest microphone sensitivity level and "C 5" is the highest.

    6.2) Its default setting is "C 1".

7) Portable using

It is available to use the Repeater as a portable device rather than the fixed station.

Please connect the Power bank for Mobile phone into the USB port of Repeater. After that, place the Repeater wherever you prefer

4. Specifications

ITEM	SPECIFICATION
Radio Frequency Type	ISM 903MHz ~ 926.5MHz
Type	Wireless Microphone/Receiver Unit
Radio Interface	FSK Modulation with Frequency Hopping
Voice Codec	16bit/8KHz
Tx Max Output Power	18 dBm Typical
Rx Sensitivity	-95dBm
Voice Latency	< 35ms
Num. of Frequency Channel	48 CH
Channel Spacing	500KHz
Data Rate	2 Mbps
Freq. Bandwidth	300KHz
Power Supply	5V, 3A DC USB adaptor or External Battery
Antenna	External Dipole Antenna
Power Consumption	Avg. 180mA
Distance Range(LOS)	1.0 Km
Frequency Response	50 Hz ~ 4 KHz

Compliance Statement
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.

CAUTION
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

WARNING
While this equipment is in operation, a separation distance of at least 20 centimeters (equal to 8 inches) must be maintained between the antenna inside the equipment and the bodies of all persons exposed to the antenna in order to meet the FCC RF exposure guidelines. Making changes to the antenna or the equipment is not permitted. Doing so may result in the equipment exceeding the FCC RF exposure guidelines. This equipment must not be co-located or operated in conjunction with any other antenna or radio transmitter.

5. How to install
5.1 Single block repeating with two repeaters

Relay part	Local part
ID : 00	ID : 01
Group : 00	Group : 09

Repaeter 1

700~1,000 m

700~1,000 m

700~1,000 m

Repaeter 2

Relay part	Local part
ID : 01	ID : 01
Group : 00	Group : 19

<Expanded communication coverage around 2.1km~ 3.0km total>

* The group number in a relay part between Repeater 1 & Repeater 2 needs to be the same.
* The group number in a local communication part between Repeater 1 & Repeater 2 needs to be different.
* The group number between Repeater 1 and its belonging 4 Multicom handsets need to be the same.
* The group number between Repeater 2 and its belonging 4 Multicom handsets need to be the same.
* The ID number of Repeater 1 and Repeater 2 need to be "00".
* The ID number of each repeater's belonging 4 Multicom handsets per group need to be different.

5.2 How to set between Repeater 1 and Repeater 2

1) Relay part

Tune the group number "00" on Repeater 1 and Repeater 2.
Even it is available to use any other Group number, It is required to tune the same group number between Repeater 1 and Repeater 2.
Set the ID "00" on the Repeater 1 and set the ID "01" or any other number except "00" on the Repeater 2.

2) Local part

Set the Group number "09" on Repeater 1 and its ID number "00".
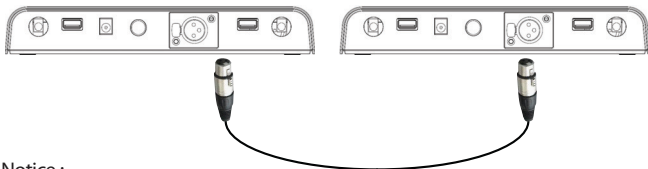Set the Group number "19" on Repeater 2 and its ID number "00".
Even it is able to use other Group number on Repeater 1 & 2,
It is recommendable to set the Group number far from "00" and also different each other between Repeater 1 & 2 as many as possible to minimize the mutual interference.

5.3 Line repeat communication between Repeater and Repeater(To be confirmed)

It is available to repeat the communication in one Repeater to the other Repeater by cable connection between two Repeater.
Please connect to two XLR 3 port of Repeater by using "XLR Repeater only cable". In this case, each Repeater are able to do full duplex communication with 9 Multicom handsets per Repeater, Which means total 18 people in full duplex.

Notice ;
It is required to keep a distance longer than 10m at least between Stationary and Stationary. Otherwise, it might cause the interference each other and the drop of performance on both stationeries.