Kirisun

INSTRUCTION MANUAL

TR850
DMR Repeater

DIGITAL

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Instruction Manual
TR850
DMR Repeater

We are very grateful for your purchasing TR850 produced by Kirisun Communications Co., Ltd. We believe TR850 can bring great convenience to your life and work.
TR850 DMR repeater which always incorporates the advanced technology and exquisite craft, we hope that the quality and function of this product could make you feel satisfied.

Notice to User

◆ Please read this Instruction Manual carefully before any operation to this product. When you start to use the product, we deem that you have read this manual carefully.

◆ Please save this Instruction Manual in a safe place for inference in need.

◆ In order to preserve your rights and interests, please fill in the Warranty Card seriously and actually when you purchase this product, and ask for the valid purchasing certificate.

◆ Kirisun and the authorized parties own the related intellectual property of all the product parts include accessories. Any design and materials may not be modified, copied, extracted or translated without the authorization of Kirisun or its authorized parties.

◆ Due to the update or modification of the product, Kirisun owns the right to change the specifications of software and hardware described in this manual without further notice. Specifications and information contained in this manual are for reference only.

◆ All described information in this manual are verified, if any missing or mistakes, Kirisun reserves the rights to the interpretation of this manual.

Safety Information

In order to use the indoor digital repeater effectively, please read the following information.

◆ This product can only be maintained by the professional technicians. Do not disassemble the radio by yourself.

◆The repeater setting and mounting must be approved by the local Radio Management Departments.

◆Installing the antenna of repeater must be do well of lightning protection, otherwise life or property damage may be occurred.

◆Please use the qualified power, antenna, lightning protection device, power divider and corresponding accessories and make sure they are installed correctly, otherwise repeater damage will be occurred.
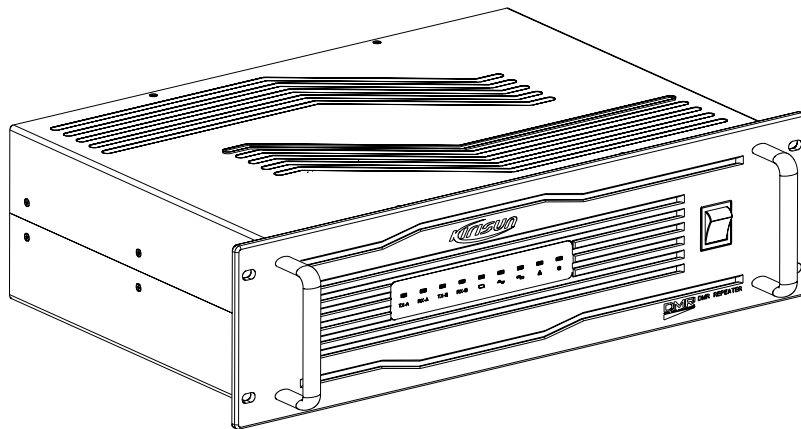
Contents
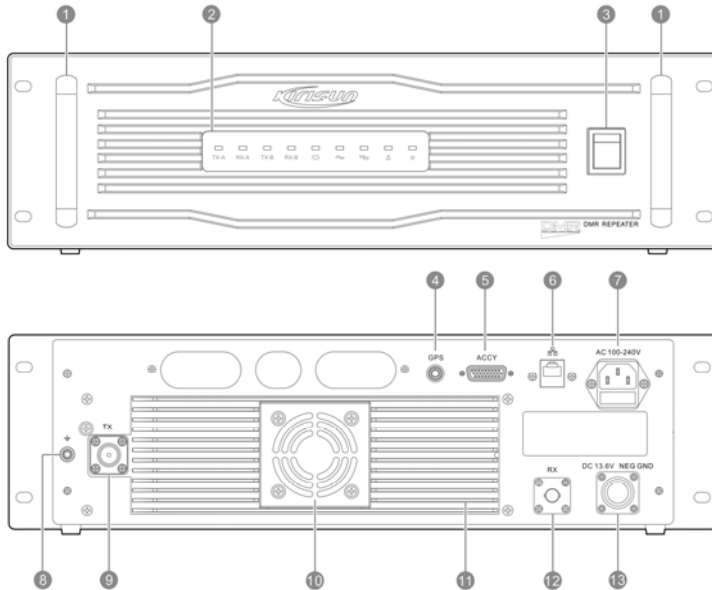
1   **Unpacking and Checking**

Please unpack carefully and check all the items listed in the following table before discarding the packing material. If any damage or loss occurs during shipment, please contact your dealer.

1.1 **Standard Accessories**

Item	**Quantity**
Repeater	1
Foot pad（4 pcs）	1
Instruction Manual	1

2   Radio Overview

No.	Part Name
1	Handles
2	Frond Panel LED Indicators
3	Power Switch
4	GPS Antenna Connector
5	ACCY Connector
6	Network Connector(IP)
7	100-240V AC Cable Connector
8	GND Screw
9	Tx Connector
10	Fan
11	Cooler
12	RX Connector
13	13.6V DC Connector

2.1   Power On/Off Button
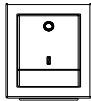
Power on/off the repeater.

2.2   ACCY Connector
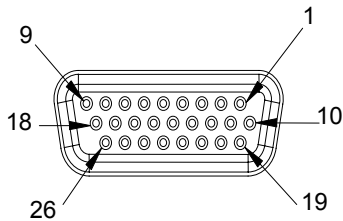
2.2.1   Pin Instruction

Pin	Instruction
PIN1	Undefined
PIN2	Undefined

PIN3	Undefined
PIN4	GND
PIN5	ACC_MAP_ID2: It is used for test.
PIN6	ACC_MAP_ID1: It is used for test.
PIN7	Undefined
PIN8	GND
PIN9	+SPEAKER
PIN10	-SPEAKER
PIN11	MIC
PIN12	GND
PIN13	Undefined
PIN14	Undefined
PIN15	Undefined
PIN16	GND
PIN17	External PTT，High level is effective
PIN18	GND
PIN19	Undefined
PIN20	Undefined
PIN21	Undefined

PIN22	PRGM_IO_7, External high level signal input
PIN23	Undefined
PIN24	Undefined
PIN25	Undefined

2.2.2   External Connector Instruction

◆ The method to activate external PTT：

Short connect the Pin17 with Pin22 of VGA to activate external PTT. It can test the transmitting signal of repeater.
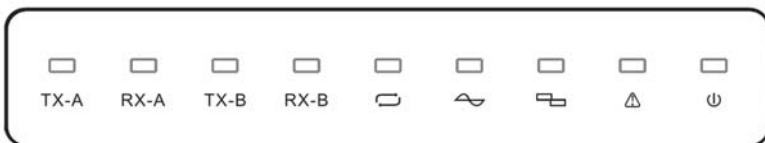
◆ Test Analog Receiving：

Short connect Pin5 with Pin22 of VGA.

◆ Reset IP address：

Short connect PIN6 with PIN22 of VGA to reset the IP and gateway address to the IP address on the label, but it will not change data of IP address and gateway address, The IP address and gateway address will recover to configure address after restart.

2.3 LED Indicators

No.	Indicator	Description
1	TX-A	Slot 1 transmitting indicator
2	RX-A	Slot 1 receiving indicator
3	TX-B	Slot 2 transmitting indicator
4	RX-B	Slot 2 receiving indicator
5	⟲	Repeater signal indicator
6	⌇	Analog mode indicator
7	⎍	Digital mode indicator
8	⚠	Alarm indicator
9	⏻	Power indicator

3   Basic Operations

3.1 Powering On/Off

When the repeater is turned off, press the power switch "□" to power on the repeater. Then the

light " ⏻ "is on. After the system working normally, the light " ⌔ "、" ⊟" indicates the

present working mode. Press □ to power off the repeater.

3.2 Voice and Data Transfer

The receiving and transmitting frequency are different on the repeater. Repeater will turn the weak receiving signal into strong transmitting signal and transmit on the same channel. When transmitting, the light ⌣ is on. If it is analog signal, ⌔ flashes, if it is digital signal, ⊟ flashes. The receiving and transmitting frequency and CDCSS/CTCSS can be set by CPS.
An analog channel or a smart analog/digital detecting channel can be programmed with one group of CDCSS/CTCSS encoding and decoding list. When receiving CDCSS/CTCSS on the channel, repeater will transmit according to preprogrammed CDCSS/CTCSS encoding and decoding list.

3.3 IP Connecting

Default IP address：192.168.1.100. Application update, parameters configuration and second

development can be made through this port.

3.4 Warning

When unusual situation happens, warning indicator light will be enlightened. For example, when Receiving Frequency unlocks, the warning light will flash once one second; Transmitting frequency unlocks, the warning light will flash once two seconds; When both transmitting and receiving frequency unlock, the alarm indicator will stay light on. When the repeater occurs unusual situation, please let the related professional to check and recover the repeater.

3.5 Programming Software

IP connecting status should be checked before programming. Make sure that the network button in the tools bar is pressed down, (If the button is not pressed down, the IP address bar will be grey, disabled), also need to make sure the connect button is pressed down (the default status of connect and network buttons are pressed down), under the status of connect button pressed down, the software will connect to the repeater by the IP in the address bar. While the connectivity is successfully built, the status bar will show "Network is OK", or the address bar will show "Network XX". If other programming software connects to the repeater, the late connect software will show"Repeater is busy", then the connect button will pop up automatically, and need to press the connect button to re-connect.

3.5.1   File Menu

New：Add new channel information, repeater will create new channel configuration files, a default analog channel, and set the default configurations,

Open: Open a configuration file that saved in the storage device.

Save: Save the current channel configuration, in order to open the file conveniently next time.

If a new created channel or a channel read from the repeater, when saving them, you need to select a new save path (similar with "save as").

Save as: Select a new path to save the current configuration file.

Exit: Exit the software, if the configuration file has not been saved, software will ask user to save it.

3.5.2   Model Menu

Model Type: to select a model type, which includes the frequencies of 136MHz-174MHz, 400MHz-470MHz or custom frequency. The custom frequency cannot exceed the range of the frequencies the repeater provides.

3.5.3   Edit Menu

General Setting

Device ID：Sets an individual ID that uniquely identifies the radio. In the Multiple Site IP system,

this ID is used to uniquely the different repeater.

Working Mode：Now, it only supports working in the single site.

Work Alone：Work as single repeater, not networking with other repeaters.

Connect Working Mode：If exceed one single repeater's coverage, this mode enables the repeater to connect with other repeaters to expand the coverage.

Group Call Hang Time：When a terminal radio initiates a group call, and no PTT presses, repeater shall hang on for a period of time. During this time, the channel is being taken up, and communication is regarded still going, no accept to other signal relay. If any presses PTT, then the hang time recounts. Once the hang time is over, this communication is over too, channel will be released.

Value Range: 0~7000ms, the step is 500ms, the default value is 4000ms.

Individual Call Hang Time: When a terminal radio initiates an individual call and no PTT presses, repeater shall hang on for a period of time. During this time, the channel is being taken up, and communication is regarded still going, no accept to other signal relay. If any presses PTT, then the hang time recounts. Once the hang time is over, this communication is over too, channel will be released.

Value Range: 0~7000ms, stepping is 500ms, the default value is 4000ms.

Emergency Call Hang Time: When a terminal radio initiates an emergency call and no PTT presses, repeater shall hang on for a period of time. During this time, the channel is being taken up, and communication is regarded still going, no accept to other signal relay. If any presses PTT, then the hang time recounts. Once the hang time is over, this communication is over too, channel will be released.

Value Range：0~7000ms, stepping is 500ms, the default value is 4000ms.

Calling Hang Time: When a call ends, the repeater will hang on for a period of time, during this time, when a terminal radio presses the PTT, no need to build connect again, just communicate directly.

Value Range: 0~7000ms, the stepping is 500ms, the default value is 4000ms.

Network Setting: When networking, different repeaters can address to build a connecting by setting the network parameters.

Local IP: The IP address of repeater, like 192.168.1.100.

Local Port: The repeaters use the UDP local port to connect to the server. The range of the port is 0~65535.

Server IP: When networking, the IP of the server that repeater connects to.

Server Port: The repeater uses TCP server, TCP server connects needs a specific server port. The range value of the port is from 0~65535.

Gateway IP：When networking, the gateway IP that repeaters interconnect to each other.

Transmit Frequency: To set the transmit frequency in the current channel. The range cannot exceed what the repeater limits.

Receive Frequency: To set the receive frequency in the current channel. The range cannot exceed what the repeater limits.

Power: To select current channel's RF power level

Fan Control: User can set the Fan Work Threshold, Power Amplifier Protect Threshold and

Standing Wave Ratio.

Power Amplifier Protect Threshold: As long as the temperature is higher than the threshold value, it stops working , the default threshold value is 80℃

Fan Work Threshold: As long as the temperature is higher the threshold value, the fan starts working. The default threshold value is 45℃.

Fan Stop Work Threshold：As long as the temperature is higher the threshold value, the fan stops working. The default threshold value is 35℃.

Standing Wave Ratio: It is used to shows if it's the antenna match with the radio. The default value is 3.0

Bandwidth: It's used to select the channel spacing of the current channel. Options are, 12.5 kHz, 20 kHz, 25 kHz, the default option is 12.5 kHz.

Colour Code: It is used to select the colour code of the current channel. As long as the radios with same colour code in the same frequency can communicate with each other.

Value Range: 0~15, default value is 1.

Squelch Type: It is used to select the receive mode of current channel.

Options: CSQ, CTCSS, CDCSS, -CDCSS.

Default Option: CSQ

Squelch Level: It is used to set the squelch electrical level.

CTCSS: If select this option, needs to select a CTCSS value, or the transmitter and receiver

cannot communicate with each other.

Value Range: The CTCSS ranges from 0~254.1Hz, the stepping is 0.1 Hz, default value is 67 Hz.

CDCSS: If select CDCSS or –CDCSS, needs to select a CDCSS value, or the transmitter and receiver cannot communicate with each other.

Value Range: 0~777(octal number), the stepping is 1, the default value is 023.

Notes:

1. Squelch level only use for analog channel.

2. Mix channel cannot select CSQ, must select CTCSS, CDCSS or –CDCSS.

4   Program Menu

◆ Read Data：Read data from the repeater

When reading data, a bar pops up and shows the reading process. When finish reading, software will pop up a dialog box, shows "Read data successfully".

When you try to read data, tick the option "Exit after finish", when finish reading data, the dialog box will exit automatically. If not tick this option, users have to press "Exit" manually to close the box.

◆ Write Data: Write the configurations into the repeaters.

When writing data, a bar pops up and shows the writing process. When finish writing, software will

pop up a dialog box, shows" Write data successfully".

When you try to write data, tick the option "Exit after finish", when finish writing data, the dialog box will exit automatically. If not tick this option, users have to press "Exit" manually to close the box.

Notes

(1) When try to read data, have to check the network, make sure the program menu tick the "Network" option, make sure the IP on the tools bar is the IP of the repeater you are going to program.

(2) When the connectivity is successful, the top of the dialog box of "Reading data" and status bar will show "Network is OK", otherwise will be shown "Network XX".

Upgrade software: the main function is to download different function modules from PC to the repeater, then set the main parameters on them.

Under the "Program" menu, find "Program Download", then you can upgrade. But before upgrading, you should select the path of the update package. If is a standard update package, after select the path, each update file's paths will be auto filled.

◆ Upgrade Boot Loader

（1）Before upgrading, repeater should be power off, boot mode select 0101, select "Download boot loader" and find the correct serial port between PC and repeater. If necessary, select the boot loader file and uboot file.

（2）Press "Download" button, then a upgrade dialog box pops up, select "Yes".

（3）When the control program shows "Wait for boot me……" the interface power on (Note: if the

below interface flashes back, maybe fail to open the serial port. Please check the serial port connectivity, or other program takes up the serial port.

（4）if the update is finished, software will note that. Please don't forget to switch the boot mode back to 1000.

◆ Upgrading the System

（1）Boot mode should be 1000 while upgrading. Choose the system programs to be downloaded, and remove unnecessary components according to needs. (For example: if the repeater could work normally and connecting the PC network before upgrade, then you could remove the hook behind the environment variable).

（2）Click "download" button to proceed. When upgrading, there is a progress bar to show the upgrading status. And there will be a prompt message after the process is finished.

◆ Upgrading the system

（1）Boot mode should be 1000 while upgrading. Choose the system programs to be downloaded, and remove unnecessary components according to needs.

（2）Click "download" button to proceed. When upgrading, there is a progress bar to show the upgrading status. And there will be a prompt message after the process is finished.
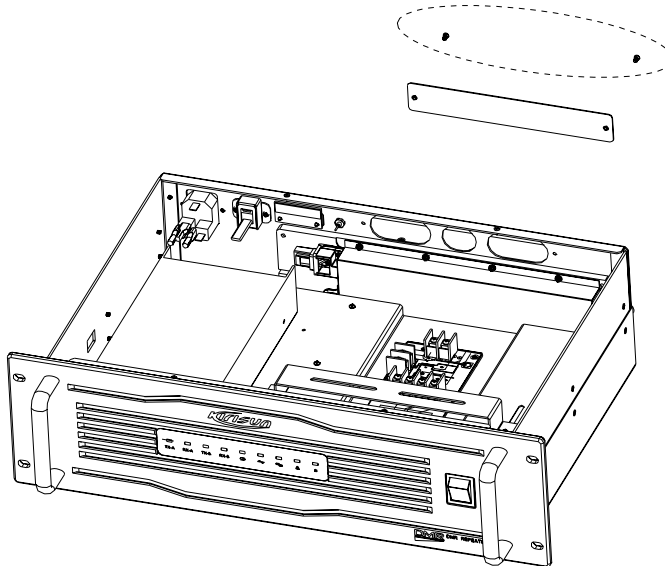
5   Installation Guide (refit guide)
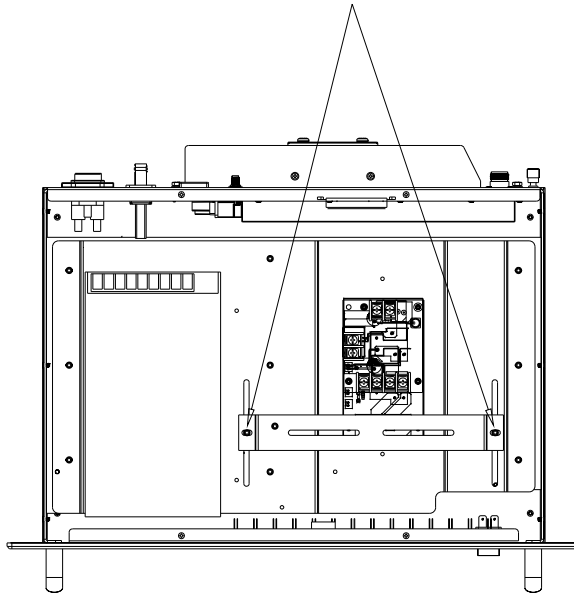
Duplexer Installation

（1）Disassembly：As the figure below, take off the 4 screws and 6 screws of two sides of the top cover, and then slightly open the top cover.
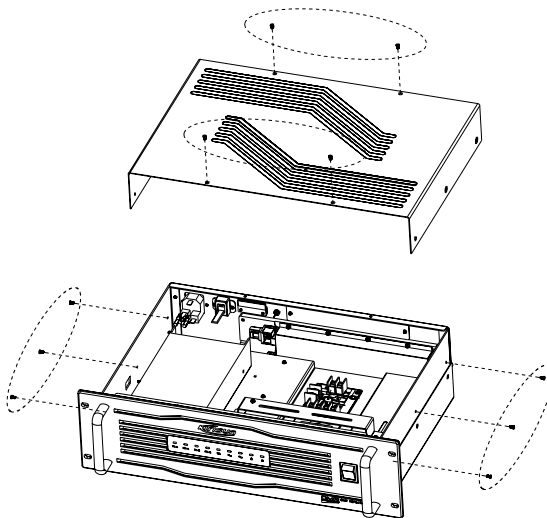
（2）Take off the two screws of duplexer baffle, remove the duplexer.

（3）Slightly loosen the two screws of fixed duplexer bracket on installed clapboard to the bracket, and do not too loosen. Refer to following figure.

（4）Fixed the duplexer tail screws to the duplexer bracket. Push the duplexer to the end three duplexer connection holes until the duplexer is locked. Then fasten the duplexer bracket and install screw. Refer to following figure.
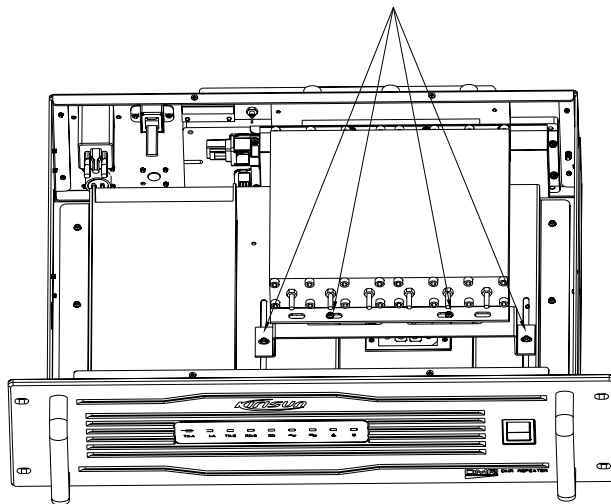
6   **Frequently Asked Questions (FAQ)**

◆   Can't connect to the PC programming software

The IP of repeater input is error in the programming software. Or the user forgets the IP of repeater.

◆   Can't transfer

Please confirm the frequency and the working mode of the radio is the same with the repeater.

7   **Recommend Duplexer Parameters**

Model	SGQ-450 A / D
Frequency Range（MHz）	380~520
Bandwidth（KHz）	±400
Frequency Spacing（MHz）	10
Insertion Loss（dB）	<1.0
Isolation (dB)	>80
Suppression(dB)	>80
V.S.W.R	<1.3
Normal Impedance（Ω）	50
Max Power Input（W）	30 / 50
Standard Termination	N/BNC
Dimensions（mm）	223×154×31.5 223×191×39
Weight（KG）	1.2 / 2.0