

Radio Bridge User Manual

ROIP102 series

Version: 1.0

2011-4-9

For the sake of environmental protection, please try to use electronic version and select the page that you need before printing.



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I. Important Note

1. This product is used for link communication between regular radio station, network and mobile phone network. Since the product relies on Internet, dedicated network and mobile telecommunication network, which have stability issue, so it is not sure that the product can link smoothly at any time. The product can only be used in regular communication system, but not **Zero Fault Emergency** System.
2. The product can extend the radio communication unlimitedly, so please get a clear understanding of the local radio regulations and use it legally.
3. The product involves dynamic DNS (Domain-IP Name Resolution), which is now temporarily provided by Hong Kong DBLTEK for free. If you need this function, you must be aware that it is not sure that this function can be used without any fault forever. If you need to establish IP name resolution server by yourself, you can ask the supplier for free software of DDNS resolution server-end.
4. Our company is not responsible for any loss or collateral loss caused by communication failures including but not limited to product fault, communication fault, etc.

Once the user uses the series of products, it means that the user has read, understood and accepted the important note.

II. Open-Package List

When receiving the series of products, please check whether you have the following products or accessories.

PTT Conversion Wire



×3

12V 2A Transformer



×1



Host

×1



CAT5 Network Cable

×1

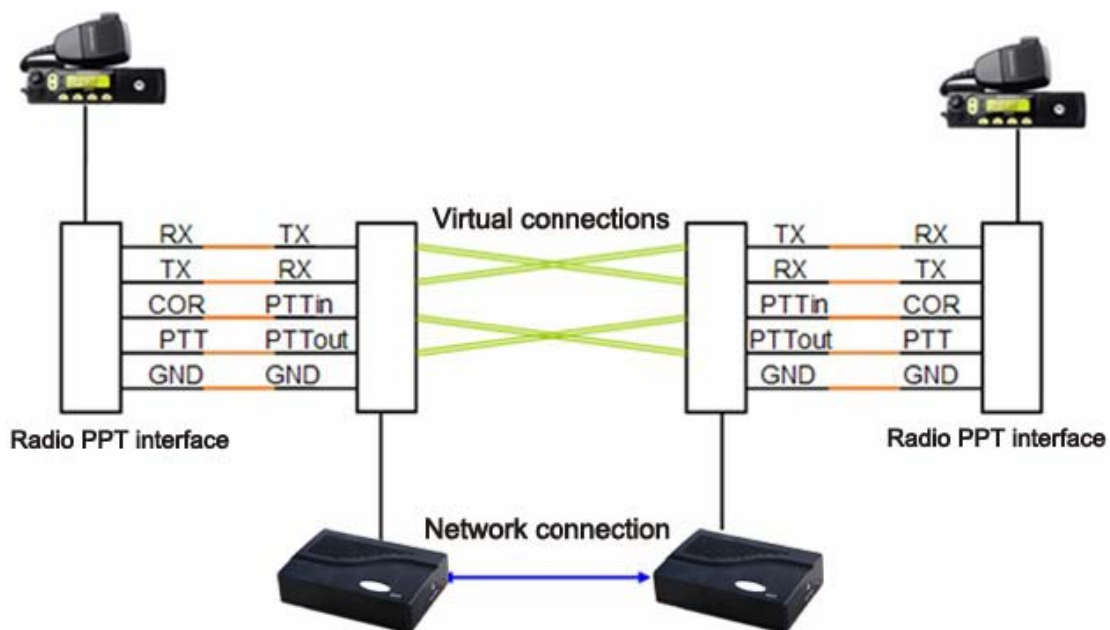
III. Introduction to Basic Functions

RoIP(Radio over IP) technology is a kind of technology that transfers audio signal loaded by Radio signal through IP net. It mainly fixes the issue of real-time and PTT signal no-fault transfer, thus eliminating such restrictions to transfer distance as transmission power, antenna sensitivity. It realizes no relay interconnection in the super long distance.

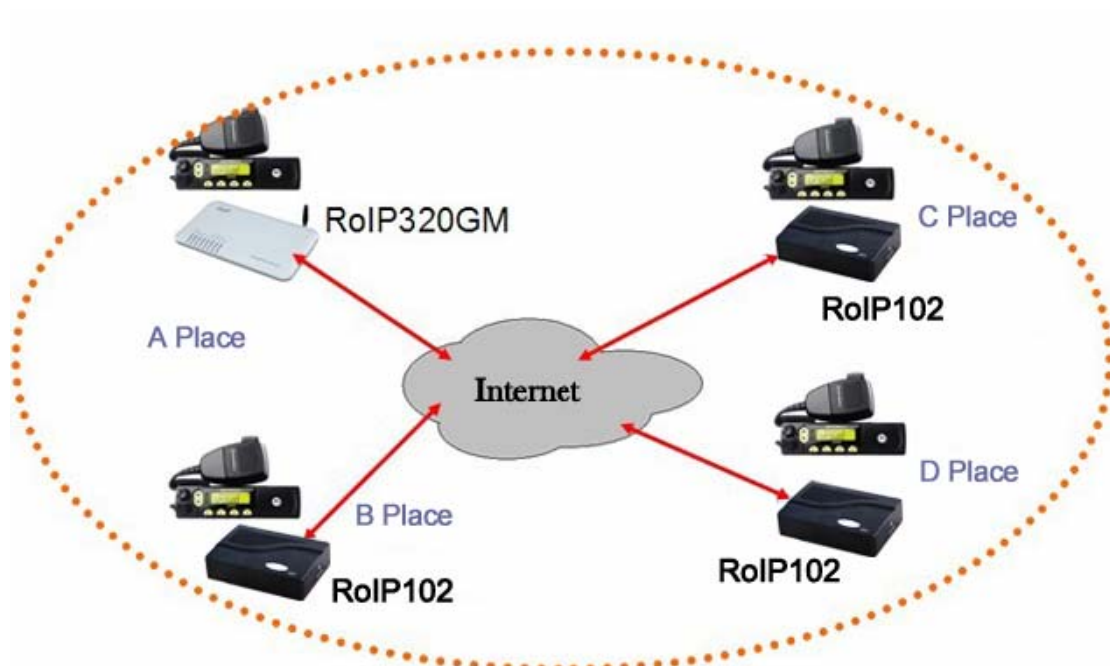
RoIP 102 basic version is a small and more practical high-tech cross-media communication device with standard configuration of one PTT port, to which only one group can be connected. There is no GSM module. It just transfers the interphone's audio signal to IP signal and then connects it to professional or standard RoIP 302M group, thus realizing the inter-communication between user-end and the central station. Besides that, there is remote control switch connector, which can realize remote control.

RoIP102 series multi-media network bridge can be installed in all kinds of current network, such as ADSL, Radio and Television IP network and the company's internal network besides dedicated IP network. Its unique DDNS (Dynamic Domain Name-IP Resolution) simplifies the user's installation and configuration, which can realize interconnection without any audio transmission server.

Basic link logic diagram:



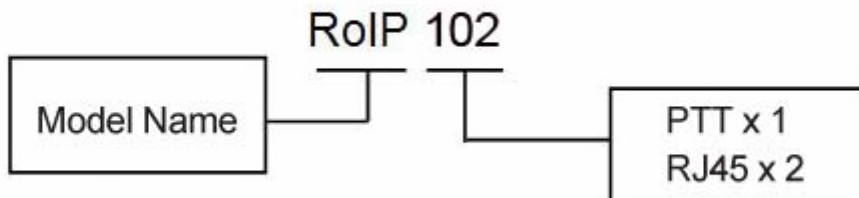
Basic network mode: Internet between multiple places



Seen from the diagram above, in Place A, RoIP302GM with conference system is used as

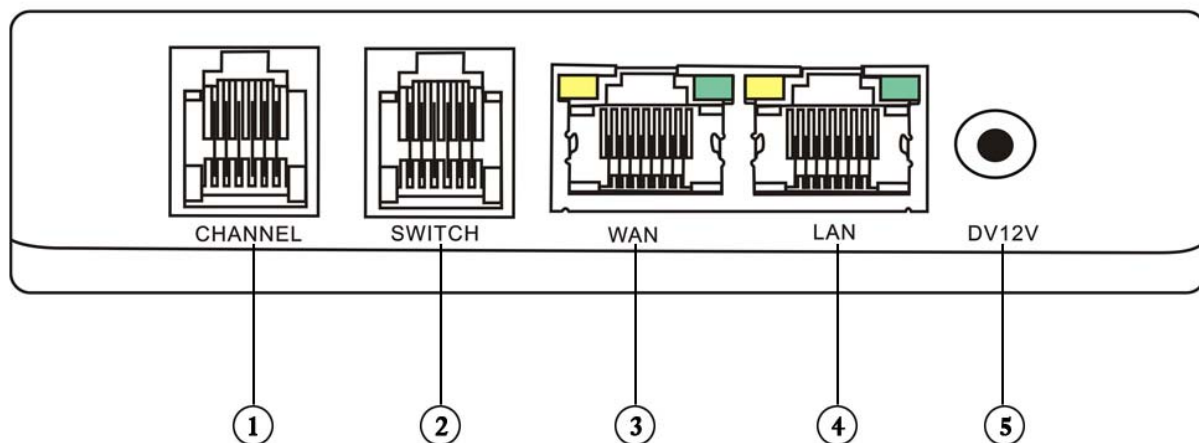
a central switching point. The other three places use RoIP102. Through this link, the radio network in places ABCD can be interconnected.

Model Name



IV. Link and Installation

1). Port Definition

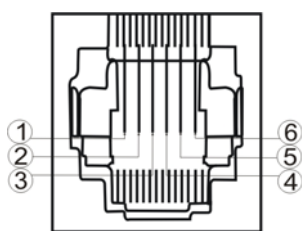


Port	Name	Function/Parameter
1	PTT1	6-needle RJ11 port
2	Remote control switch	220V 500mA switch(relay segregation)
3	WAN port	Connecting network input 10/100Base-T
3	LAN port	Connecting network output 10/100Base-T
5	Power socket	12V 1A

2). LED Display Definition

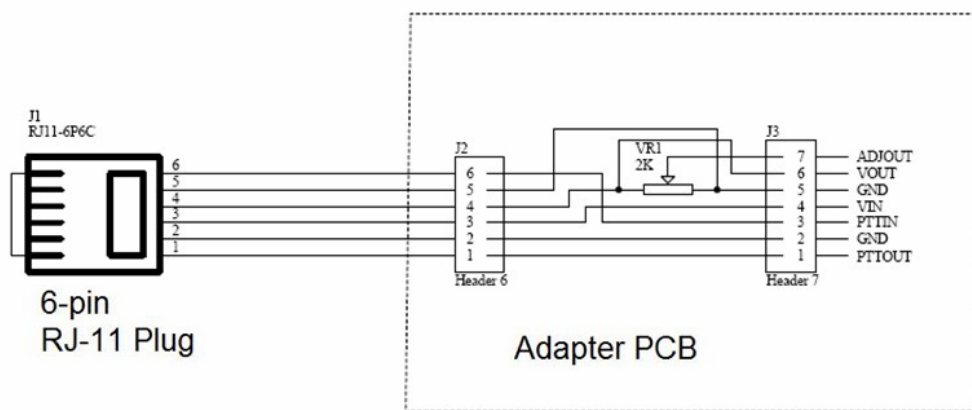
LED indicator	Function	Description
RUN	Operation status indicator	4 times/second indicates no connection. Twice/second indicates normal operation.
Channel 1	Channel 1 status	Channel 1 is receiving or transmitting.

3). PTT Port Wire Diagram

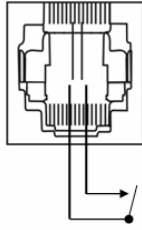


1. PTTOUT	2. GND
3. Vin (RX)	4. Aout (TX)
5. GND	6. PTTIN

4). Connecting Cable Circuit Diagram

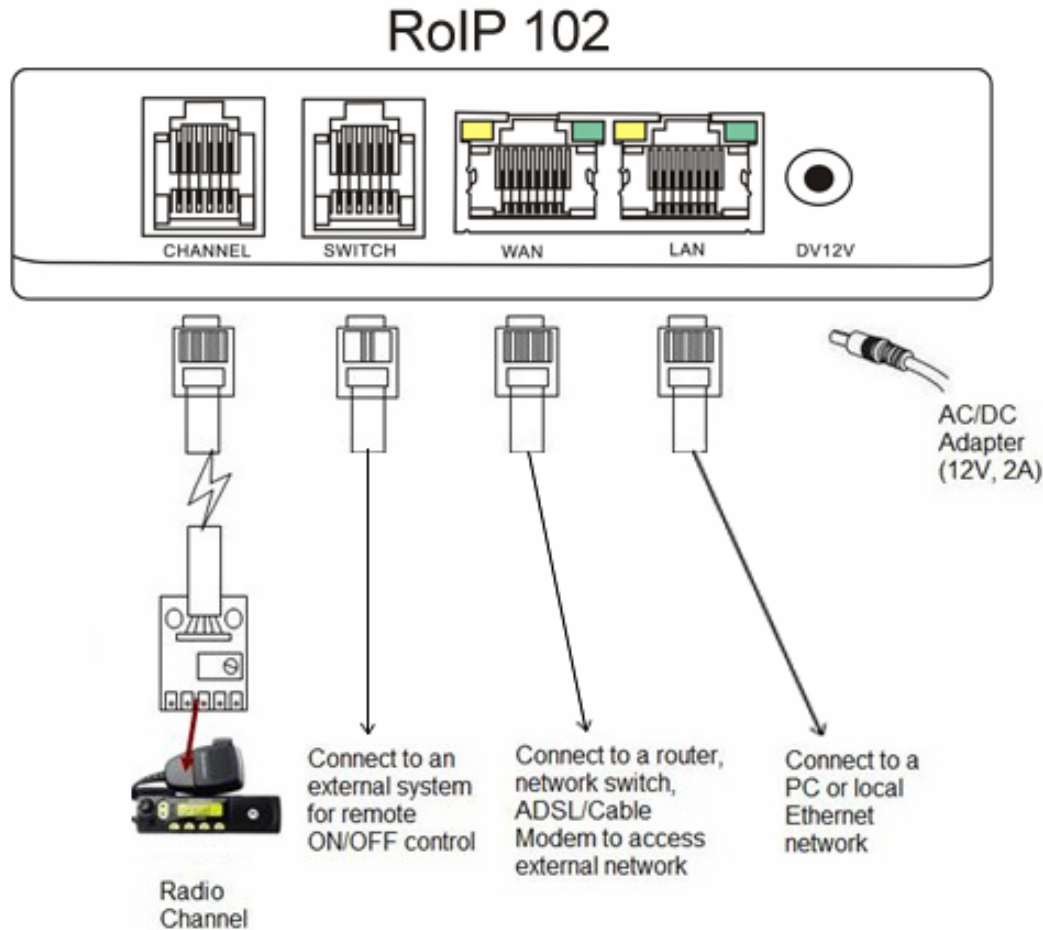


5). Remote Control Switch Connection Diagram



To put RJ11 crystal plug into RoIP102 switch socket, with two centers in the middle as two ends of the switch. Starting is normally open status.

6). Host Connection



While connecting, plug the radio station and remote control switches into RoIP102 and set port respectively as required.

WAN port needs to be connected to the devices that have link to IP network, such as ADSL Modem, network router, dedicated network router or network switch.

If remote control switch is needed to control high-voltage equipment, the cables that are used must be able to withstand the voltage. The maximum voltage that internal relays can withstand is AC 240V.

For the computers that share the network can be used for network sharing and device setting. In order to make the best audio effect, please try not to use the computers that share the network for surfing on the Internet.

V. Delivery Setting List

The following table is the basic delivery setting of the device. When you need to recover the delivery setting, you need to press RESET for 15 seconds or select the item of recovering the delivery value in the tool selection on the configuration page.

Item	Delivery Setting	Setting Range
Log-in user	admin	
Log-in password	admin	User can modify (16 or less characters and numbers)
WAN port status	DHCP	
LAN port status	192.168.8.1	Can be configured to be C-period IP
PTT status	"0"valid	"0" is low-potential valid, and "1" is high-potential valid
Maximum PTT validation period	60 seconds	Less than 600 seconds
Jitter Delay	60 milliseconds	20-220 milliseconds

VI. Initial Setting

- 1). Enter RoIP102

Set IP of the computer connected to LAN port as 192.168.8.x (x=2-254). Input 192.168.8.1 in the address bar of the browser, then the following enter frame will be shown.



Input user ID and password to log in to the configuration interface (the initial user ID and password are respectively admin and admin)

*After modifying the setting, please click “save modification” to save the setting.

2. Setting Network:

Network setting is critical to whether RoIP102 can work normally and stably. The best environment for network connection is dedicated network cable with static IP, and then the dynamic public IP, such as ADSL, broadcast and television network, the IP in internal network with shared router is relatively unstable. If the internal network sharing wire is a must, we strongly recommend setting the router with IP from DMZ to RoIP102.

When setting network, confirm the used network status first. We usually advise you to use static IP. If selecting static IP, you should select “static IP” from the down menu of the network setting column WAN port and input correct IP, subnet mask, default route (gateway), DNS server provided by the network administrator in the network setting columns as follows:

Network Configuration			
LAN Port	Static IP	PC Port	Static IP
IP Address	192.168.2.197	IP Address	192.168.8.1
Subnet Mask (optional)	255.255.255.0	Subnet Mask	255.255.255.0
Default Route	192.168.2.3	DHCP Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Primary DNS	202.96.134.133		
Secondary DNS (optional)	202.96.128.68		

If lines that need number dialing like ADSL are used, in WAN port, you should select PPPoE, and then input user ID and password as follows:

Network Configuration			
LAN Port	PPPoE	PC Port	Static IP
User Name	test@163.gd	IP Address	192.168.8.1
Password	●●●●●●●●	Subnet Mask	255.255.255.0
		DHCP Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

3). Setting DDNS:

If you use dynamic IP and do not rely on the server to exchange, then you can use DDNS service, which is the dynamic IP address resolution service provided by DBLTEK for free. While using this function, any RoIP can use the serial number as the domain name, and get the called party's IP by DDNS server (both parties use DDNS). The setting method is as shown in the following diagram. First, to select DDNS, and then according to the current service supplier's address, to input hk.ippcn.com as "DDNS server address", 39980 as the terminal, 600 seconds as the update time.

After DDNS is being used, the linked address will be www.serial_number.com

DDNS

DDNS Address

DDNS Port

Update Interval

RoIP Work Mode

[Remote Control>>](#)

Serial number can be seen in the status page

Status

Phone Information

Serial Number R10210120006

VII. Call Settings

1). Call Logic:

RoIP102 can make interconnection by using SIP server as the agent or can be used independently to make point-to-point connection. Since the server will reduce communication efficiency and make network less stable, we strongly recommend network connection through point-to-point connection. Therefore, this user manual focuses on the point-to-point configuration.

2). Enter and Calling Logic

Since among different RoIP102 devices, the other party's IP and membership need to be known, so we need to log in. While using SIP server mode, all linked terminals will log in SIP server, and the phone numbers are distributed by SIP server.

While using point-to-point connection, any RoIP102 can let other terminals to log in as Host, and the Host needs to log in the IP of its own computer. Host sets its own

phone number and let other terminals to call. It needs to log in the Host's terminal to set its own phone number for identification.

3). Calling Setting

Call Settings

Group 1 [Advanced>>](#)
[Media Settings>>](#)

Group SIP Number

SIP Proxy

Register Expiry(s)

Authentication ID

Password

Auto Dial Number

Group 1 is to set the group number. Each RoIP102 needs to set one number.

Group number is the only identifier of this group connecting with PTT, if SIP server is used, then the server end determines, if the point-to-point connection is applied, then the administrator makes the decision.

Proxy server is the address of SIP service. While using point-to-point connection, it acts as the Host to input the server's IP address or its DDNS address. As the terminal, to input the IP address or DDNS address of the Host that needs to be logged in.

Automatic connected number is the number by which every terminal account can automatically call the Host. After the server is started and the terminal is successfully registered, it will automatically call the responding number to set up connection.

4). PTT Setting:

PTT Settings

PTT1

Input Active Level

Output Active Level

PTT Output Expiry(s)

PTT as Master

PTT setting is to determine the input and output electrical level valid value of each PTT, setting "0" valid means that the port's PTT is low-potential valid, and the setting "1" indicates the PTT port is high-potential valid. Correct selection should be made for radio stations with different models.

The maximum PTT output time (second) is a kind of method for protecting the radio station from long transmission, please set according to detailed demands.

Notice: Do Not select the PTT as Master choice in normal condition.

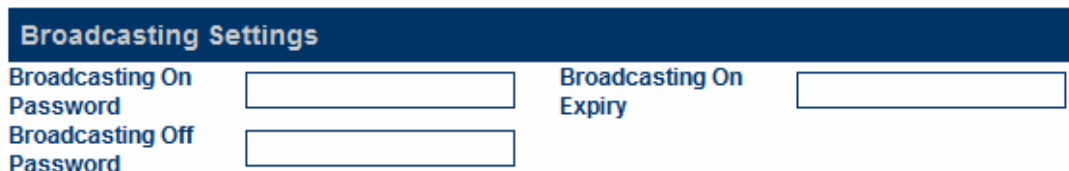
6). Recorder Setting



The screenshot shows a dark blue header with the text "Recorder Settings" in white. Below the header, there is a radio button labeled "Group 1" which is selected. Underneath, the label "Recorder Address" is followed by a white rectangular input field.

Recorder setting is to set the recording server address of each group for recording. Please refer to Recording Software Instruction.

7). Broadcast Setting



The screenshot shows a dark blue header with the text "Broadcasting Settings" in white. Below the header, there are four labels with corresponding input fields: "Broadcasting On Password" and "Broadcasting Off Password" are on the left, and "Broadcasting On Expiry" is on the right. Each label is followed by a white rectangular input field.

Broadcast setting actually is the password for remote switch. After switching on, there is no off verification password, then the automatic off broadcast time will decide when to switch off automatically (the time unit is second).

Remote switch can only be controlled by one group's members, so please select the group to which the broadcast switch belongs.

8). Group Voice Coding Setting



The screenshot shows a dark blue header with the text "Group Codec Settings" in white. Below the header, there is a radio button labeled "Group 1" which is selected. Underneath, the label "Codec" is followed by a white dropdown menu showing the value "alaw".

Voice coding is the voice compression technology used by IP phone. Using different voice compression technologies can reduce the occupation level of the network bandwidth. The higher the compression rate is, the worse the sound quality is. Usually we use alaw, ulaw or g729. Alaw and ulaw needs to occupy the bandwidth of 82KbPS for each, each g729 needs to occupy the bandwidth of 26KbPS. But when the radio station needs to transmit data, only alaw or ulaw lossless code can be selected.

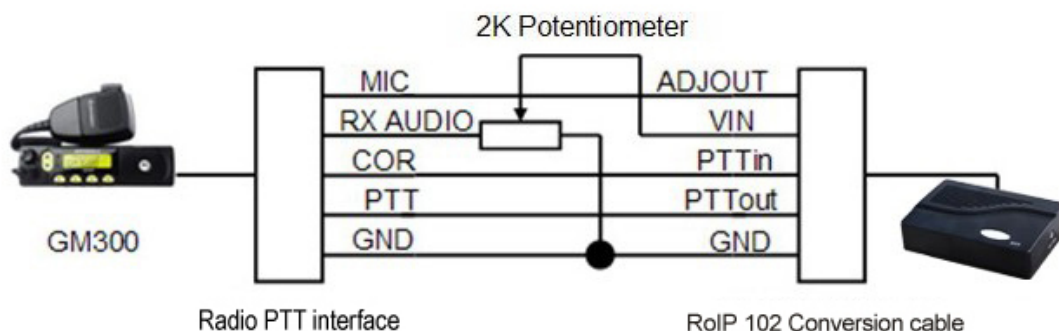
All terminals that join the same group must select the same voice code.

VIII. Application Example

1). Two-point single-channel direct connection. MOTO's GM300 radio stations are used in both places, where ADSL dialing network is used.

Hardware connection:

Use Channel 1 to connect the transition cable and GM300's conversion wire:



RoIP102 WAN port can be connected to any terminal of ADSL router. Fixed IP needs to be set, for example as 192.168.1.101. Router sets external network DMZ to be 192.168.1.101.

Network is set as:

Network Configuration			
LAN Port	Static IP	PC Port	Static IP
IP Address	192.168.2.101	IP Address	192.168.8.1
Subnet Mask (optional)	255.255.255.0	Subnet Mask	255.255.255.0
Default Route	192.168.2.1	DHCP Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Primary DNS	202.96.134.133		
Secondary DNS (optional)	202.96.128.68		

The domain name server address in the diagram above needs to be adjusted according to the local supplier's domain name server address (DNS).

GM300's PTT(COR) input and output valid value is low electrical level, so the PTT setting is:

PTT Settings

PTT1

Input Active Level

Output Active Level

PTT Output Expiry(s)

PTT as Master

Suppose Place A is the Host, whose number is 101 and serial number is ROIP20100610005, DDNS and calling setting is as follows:

DDNS

DDNS Address

DDNS Port

Update Interval

RoIP Work Mode

[Remote Control>>](#)

DDNS setting

Call Settings

Group 1 [Advanced>>](#)

Group SIP Number [Media Settings>>](#)

SIP Proxy

Register Expiry(s)

Authentication ID

Password

Auto Dial Number

Calling setting

Place B's serial number is ROIP20100610006, its DDNS and calling setting is as follows:

DDNS

DDNS Address

DDNS Port

Update Interval

RoIP Work Mode

[Remote Control>>](#)

DDNS setting

Call Settings

Group 1 [Advanced>>](#)

Group SIP Number [Media Settings>>](#)

SIP Proxy

Register Expiry(s)

Authentication ID

Password

Auto Dial Number

Call setting

Calling setting (xxx in www.xxx.com is the serial number set in Host A, for example, ROIP20100610005)

Only one radio station is connected on both sides, so the group is set as follows:

PTT Settings

PTT1

Input Active Level

Output Active Level

PTT Output Expiry(s)

PTT as Master

In order to select the best sound quality for interconnection, alaw is selected as the voice code on both sides:

Group Codec Settings

Group 1

Codec

After connecting and saving settings, to restart RoIP102 and turn on the radio station, then both sides can be interconnected. After connecting, the potentiometers on both ends need to be adjusted to the best sound quality. (Please refer to Router Instruction on router DMZ setting method).

IX. Hardware Characteristic Description

1. Mechanical and working environment characteristic

Dimension: 25×14×3CM

Host net weight: 380g

Storage environment temperature: -40°C - 80°C

Working environment temperature: 0°C-40°C

2. Main board parameter

CPU: ARM9

RAM: 16M

FALSH: 4M

DSP: 116M16Bit

3. Electrical property parameter of PTT terminal

PTT IN low-potential valid value: <0.7V (4.7K load)

PTT IN high-potential valid value: >1.2V

PTT OUT high-potential output: 5V (4.7K load)

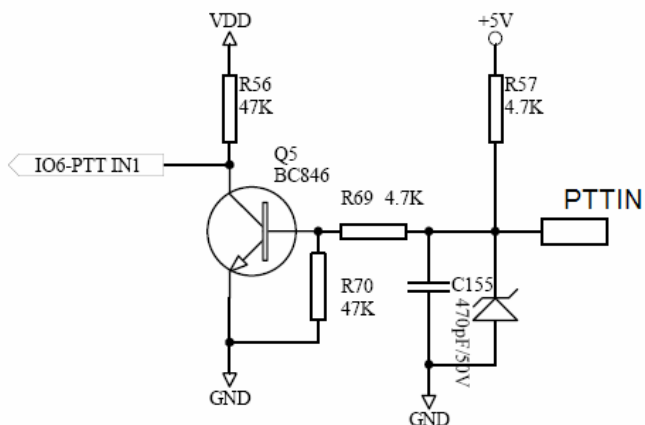
PTT OUT low-potential output: 0V

APUT output: 8Ω 750mW 5V P-P

AIN input: 600Ω internal resistance 0-0.6V P-P

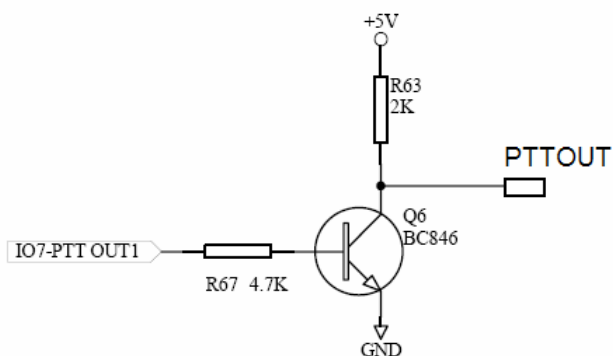
Conversion Wire ADJOUT: 2K adjustable resistance output

PTTIN circuit:



*** Based on the circuit above, when PTT input valid value is set as "1", no-link electricity can detect high potential.**

PTTOUT circuit:



4. Network port parameter

Network port amount: 2

Network standard: 10/100Base-T

Execution standard: IEEE802.1p

IP standard: IPV4

X. Software Characteristic Description

Item	Description	Note
Operation system	Linux	Version 2.6
IP phone	SIP 2.0	With extended SIP INFO

communication protocol		
Network protocol	IP, TCP, UDP, HTTP, ICMP, DHCP CL & SRV, NTP, TFTP, ToS, telnet	
Voice code	G.711 a&μ G.729A G.729AB G.723.1 GSM	
Setting page	Html XML2.0 JAVA	