

Cross-Network Gateway (Radio, VoIP, Public Announce)

User Manual

ROIP102 Series

Version: 1.0

2011-4-9

For environmental protection, please view this manual electronically and only print the pages you need



- RoIP-102 -

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I. Important Notices

i. This product is used to link up the civilian radio network,internet,and cellular phone network.Its operation and performance rely on the broadband network connections via private and/or public networks and the cellular phone networks.Due to the stability and reliability of these networks,this product may not be able to link up all the networks connected without any interruptions.Therefore,it is not recommended to use this product in an emergency system or a communication system with zero-failure.

ii. This product can bridge and extend radio networks all over the world.Please consult your local regulations in order to use this product legally.

iii. This product requires the use of dynamic DNS(DDNS) service.For testing purpose,this DDNS service is temporary provided for free by DBL Technology(Hong Kong).How ever,this service is not guaranteed without any interruptions.Customers are urged to build their own DDNS server or obtain this service from a DDNS provider.Free DDNS server software may be obtained freely from your local network service provider.

iv. Customers and/or users are taking full responsibilities and all risks in using this product.We are not responsible for any direct or indirect losses caused by,but not limited to,communication failures as a result of product failure or network problems.

CUSTOMERS ARE ASSUMED TO HAVE READ AND ACCEPTED WITH FULL UNDERSTANDINGS OF THE IMPORTANT NOTICES STATED ABOVE.

II. Gift Box Check List

Upon unpacking the gift box, please check carefully that all items listed below are included. Please report to your supplier for any missing items immediately.



1×PPT Adapter Cables



1×AC/DC Adapter

Input: 110/220 VAC

Output: 12VDC, 2A



1× Main Unit



1×Ethernet Cable

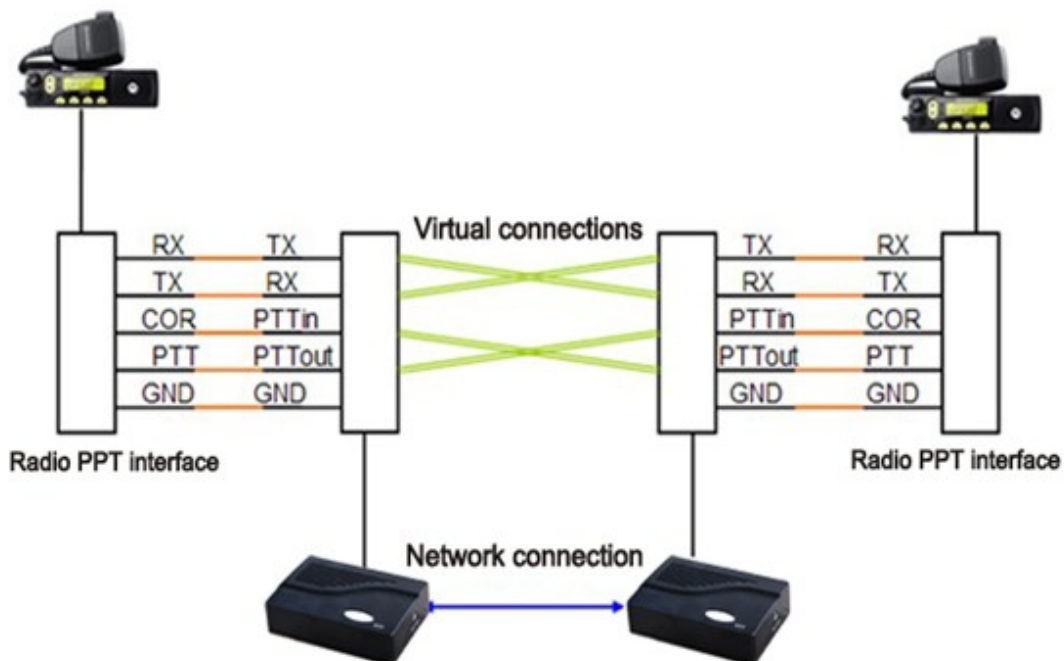
III. Overview

The fundamental of RoIP Radio over IP technology is to convert the audio and PTT signals in a radio terminal into IP packets and then transmit the data via the IP networks. The challenge in this technology is to insure that the audio is transmitted in real time and the PTT control signal is transmitted immediately and reliably. The radio range is general limited by the restricted transmitting power, the antenna sensitivity, and other environmental factors. The success deployment of this technology extends the coverage of a radio network without using expensive repeaters or links up multiple radio networks in the world. In addition, this technology can also link up the radio world to the VoIP world and the cellular world easily. It truly makes voice communications across multiple networks possible.

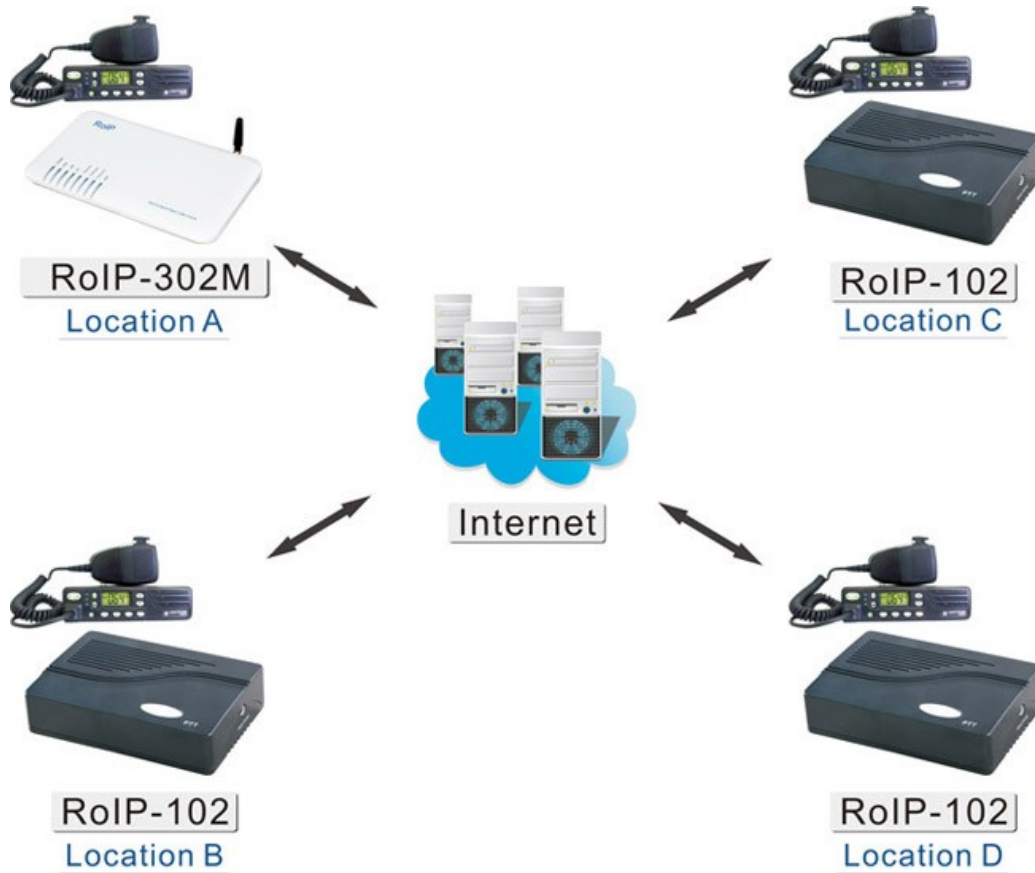
RoIP 102 basic version is a more compact, more practical high-tech multiple network (Radio, Cellular, VoIP) equipment, which access to a group, no GSM module, simply complete the radio voice signals into IP signals, access to the Professional Edition or Standard Edition RoIP 302M group, to achieve the client and the central station intercom communication. Also has a remote control switch interface, which enables remote control.

RoIP102 gateway can be installed in IP networks with intranet or internet connections via ADSL modem, Cable modem, or Local Area Network (LAN). The unique built-in DDNS client can help to simplify the installation and configuration without relying on a voice relay server in order to achieve interconnections among RoIP Series gateways.

i. Basic link diagram

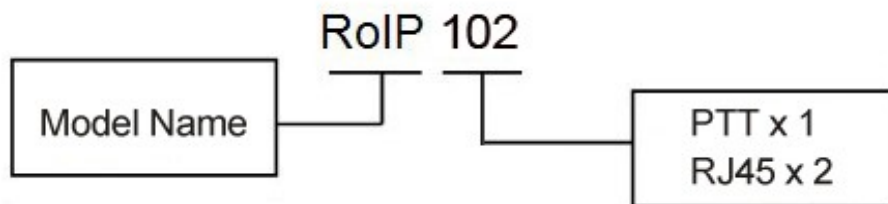


ii. Basic networking:multi-region over internet



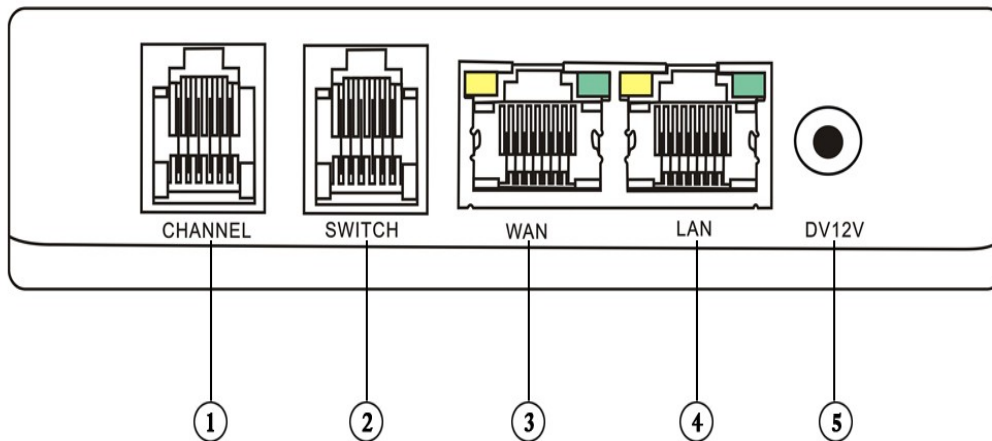
The diagram above demonstrates A to use with the conference system RoIP302M as a central switching point,the other three regions using RoIP102.Through this link,ABCD four areas to achieve multi-region interconnections among RoIP Series gateways.

iii. Model Nomenclature



IV. Installation

i. Back Panel



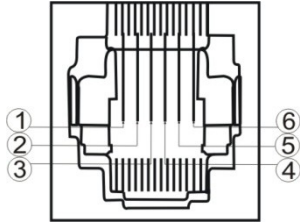
Label	Name	Description
1	PTT1	6-pin RJ11 port for PTT Adapter Cable
2	Reote Switch	Relay switch with 220VAC input and 500 mA load current.
3	WAN	10/100Base-T WAN connection for external
3	LAN	10/100Base-T LAN connection
5	Power	12V 1A

ii. LED Indicators

LED	Function	Description
Power	Pwoer	Lights up when the power is connected
RUN	RoIP Status	Flashes every 4 s indicates the device is not ready Flashes every 2 s indicates the device is ready
LAN	LAN port status	Lights up when the LAN port is connected Blinks when there are data transmissions.
PC	PC port status	Lights up when the PC port is connected. Blinks when there are data transmissions.
Channel 1	Channel 1 Tx/Rx status	Channel 1 is receiving / transmitting.

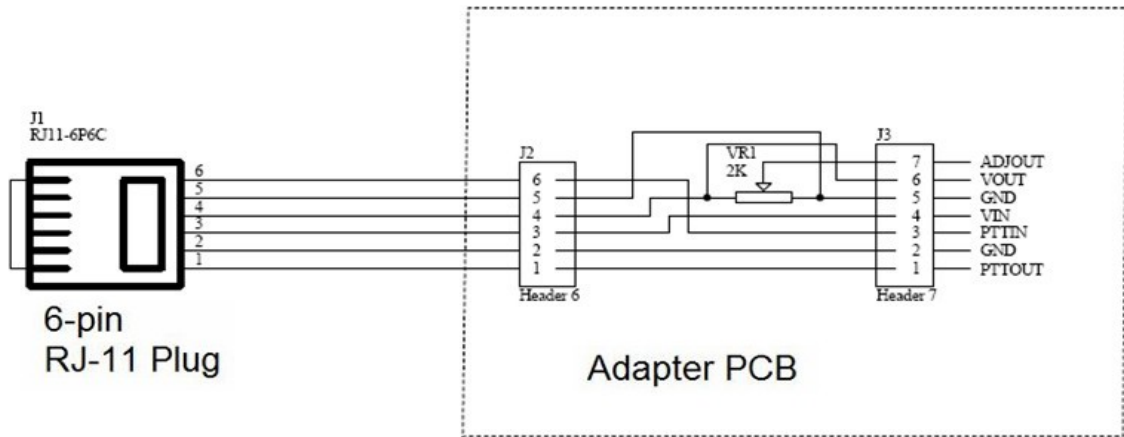
iii. Channel Port Pin Assignment

The channel port is 6-pin RJ-11 Socket

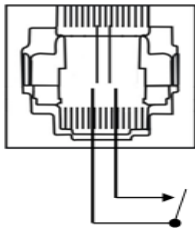


1、PTTOUT	2、GND
3、Vin (RX)	4、Aout (TX)
5、GND	6、PTTIN

iv. PTT Adapter Cable wiring Diagram

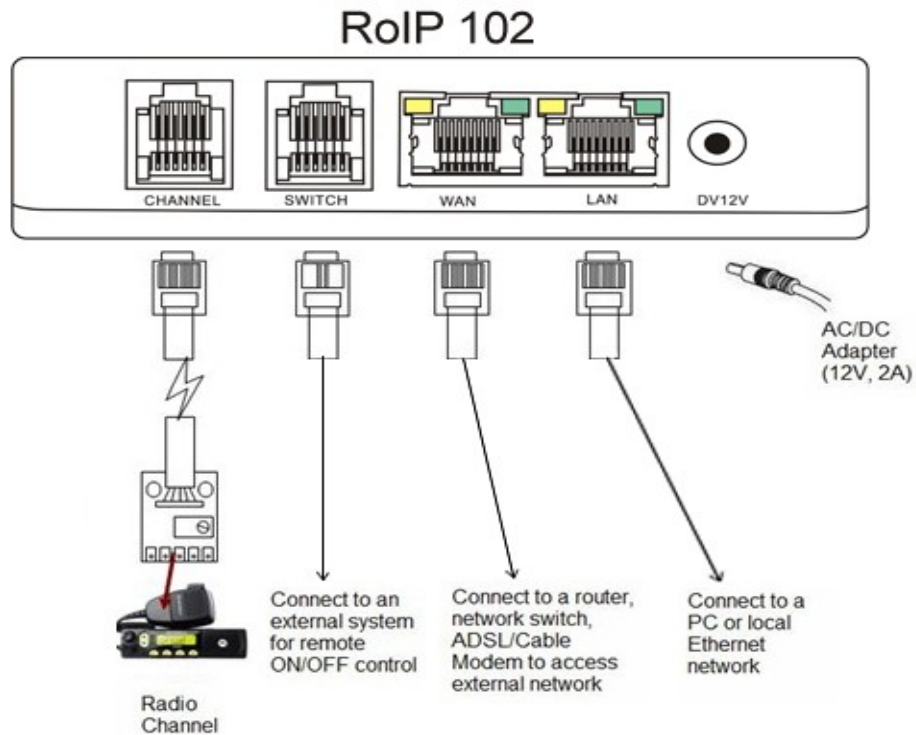


v. Switch Port



The built-in relay switch is connected to the middle two pins of the RJ-11 socket. It acts as an ON/OFF switch for the external system connected.

vi. Main Unit Setup



Connect the Channel Port to a Radio Channel via the PPT Adapter Cable provided. Up to 1 channel is supported.

Connect the WAN Port to a router, network switch, ADSL/Cable Modem for access an external network or the public network.

Connect the Switch Port to an external system for remote control. It can be used to switch on and off a Public Announce (PA) system to instant broadcast. If the relay switch is connected to high voltage load. The maximum rating for the internal relay is 240VAC and 500 mA load current.

Connect the LAN Port to a local PC or a local Ethernet network (LAN). This allows sharing the external network connected to the WAN Port with the local network. However, the shared network is intended for configuration of the device and is best not used for high data traffic applications in order for the device to insure the best voice quality.

V. Default Factory Settings

The table below shows the factory default settings. There are two ways to reset to the factory default settings:

- i. Press the RESET switch for more than 15 seconds.**
- ii. In the Configuration page, select Tools and then Reset Config.**

Item	Factory Default Settings	Range
Login ID	admin	
Login Password	admin	Programmable(16 characters in the ASCII table)
WAN Port Setting	DHCP	
LAN Port Setting	192.168.8.1	
PTT State	“0” is active	“0” is active low “1” is active high
PTT maximum duration	60 seconds	Less than 600 seconds
Jitter Delay	60 milliseconds	20-220 milliseconds

VI. Device Configuration Via Built-in Web Server

The built-in web server provides a comprehensive way to fully program the device manually

i. Web Server Login

There are two methods to access the built-in web server.

Method 1 is to access the built-in web server via the LAN port. Connect a computer to the LAN port of the RoIP102 and configure its IP to 192.168.8.x(x=2 to 254). Type the IP address 192.168.8.1 in the address field of a web browser. The following login window is then displayed.



Enter the User name and the password now. The user name for the administrative level is “admin” and the default password is “admin”.

Please make sure to click on “Save Changes” after configuring the device.

Method 2 is to access the built-in web server via the WAN port. The WAN port is set to DHCP mode as a default factory setting. When it is first connected to a network with a DHCP host, it obtains an IP address automatically from the host. In order to listen to the IP obtained, make a call to the PSTN number. Once the call is answered, the device plays a voice prompt to ask for password. Dial “*00” and the device then reads out the WAN port IP address.

Enter this IP in the address field of a web browser to get a login window as described in Method 1.

ii. Network settings:

The network settings determine the work’s normal and stable of RoIP102. The network

connection's optimal environment is private network with static IP route, followed by a dynamic public IP, such as ADSL, Radio and TV network, under the shared router IP network is relatively unstable. If you must use the network shared line, strongly recommended the router set to DMZ to RoIP102 used IP.

Setting up a network first used to confirm the network status, the general recommendation to use a fixed IP. Choose a fixed IP, WAN port on the network set the bar drop-down menu to select "Fixed IP", in accordance with the network administrator to provide the IP, subnet mask, default route (gateway), DNS server, fill in the correct column in the network settings, Below:

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 you are using ADSL dial-up needed line, select the WAN port to PPPoE, the corresponding username and password to complete the following chart:

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

iii. DDNS Settings:

If you use dynamic IP does not depend on the exchange server, the user can use the DDNS service. is provided free of charge's dynamic IP address resolution services by DBLTEK.

If you use dynamic IP does not depend on the exchange with server, the user can use the DDNS service. DDNS service is a dynamic IP address resolution services is provided free of charge by DBLTEK. Use of the function, any RoIP device can be used body No as domain name. Through the DDNS server for the called party's IP (both sides are using DDNS) setting mode as shown below. First select the DDNS, and then accordance with existing service providers addresses to fill out "DDNS server address" hk.ipcn.com, port:39980, update time:600 (second) and the device serial number (see bottom bar code paper machin SN:).

After using DDNS, the connected address will be

www.device serial number.com。

DDNS Address	<input type="text" value="hk.ippcn.com"/>
DDNS Port	<input type="text" value="39980"/>
Update Interval	<input type="text" value="600"/>
Domain Name	<input type="text" value="ROIP20100609001"/>

Remote Control>>

VII. Call settings

i. Call Logic :

RoIP can be connected between each other by SIP server as a proxy,can also be used independently by the way point to point.Because communication through the server will reduce efficiency and increase instability,it is strongly recommended to use the way point to point network.Therefore,this guide focuses on telling point is configured.

ii. Log in and call logic

Between the different RoIP102 need to know each other's IP and the attribution,so you need to login.In the case of using the SIP server mode,all terminals connected in network must be log in to the SIP server,Phone number is allocated by the SIP server.

When using point to point connection,any RoIP102 as a Host to other terminal login,and the host itself need to log into owns IP address.Host set up own's phone number to be called by another terminal.The terminal need to log in to the host must have to set themselves phone number for identification.

iii. Call Settings

Call Settings	
<input checked="" type="radio"/> Group 1	
Group SIP Number	101
SIP Proxy	192.168.2.215
Register Expiry(s)	300
Authentication ID	
Password	
Auto Dial Number	

Advanced>>
Media Settings>>

Group 1 : is to set the group number.Each RoIP1102 need to set a number.

Group SIP Number : is connected to the PPT group and the group's unique identifier,if using a SIP server provided by the server end.If use of point to point connections from their own layout manager.

SIP Proxy : is the SIP service address.When using point to point connection,if RoIP102 as a host,you need to fill out themselves IP address or DDNS address.If as a terminal,fill the host should be log in whos IP address or DDNS address.

Auto Dial Number : is a appropriate number in the terminal it self to call the host automatically.

When registered successful after start up,the terminal will automatically calls the number corresponding to a connection.

iv. PTT Settings:

PTT setting is to determine each PPT input and output Active level RMS value.PTT settings determine each of the input and output RMS level,set “0” represents the effective interface potential efficient PTT is low,is set to “1” indicates that the PTT interface is high potential effect.For different types of radio stations require accurate selection.

PTT Output Expiry (second) is to protect the station will launch as a means for long,press the specific needs of the setting

v. Recorder Settings

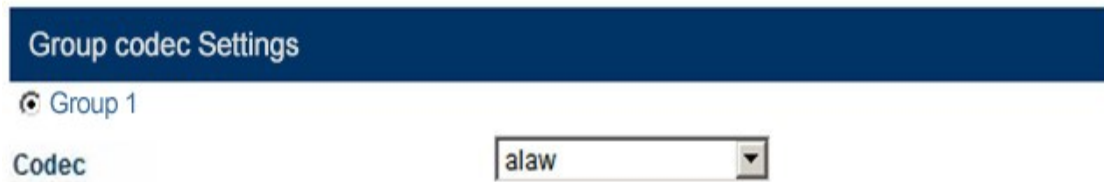
Redorder Setting is set for each group recording audio server address need to recording,refer to the recording software instructions.

vi. Broadcasting Settings

Broadcasting Settings is actually setting the password for Radio remote switch,when the switch is opened and not receiving the turn off password,then the Radio by the length of time to decide when to switch off automatically(time in seconds).

Remote switch can only be control by a member of a group,so please select the which group is radio remote switch belonged to.

viii. Public Announce (PA) Settings



The RoIP302 provides a relay switch to control a PA system. When the RoIP302 receives the PA ON Password, it turns on the relay to activate the PA system. Audio is transmitted to the PA system at this time. When the RoIP302 receives the PA OFF Password, it turns off the relay to deactivate the PA system. The duration for the relay to be in the ON state is limited by the value set in the parameter PA ON Expiry. This mechanism shuts down the PA System automatically. The PA Control Group defines which group has the control over the relay switch. Only the radio terminals in the group specified can broadcast to the PA System.

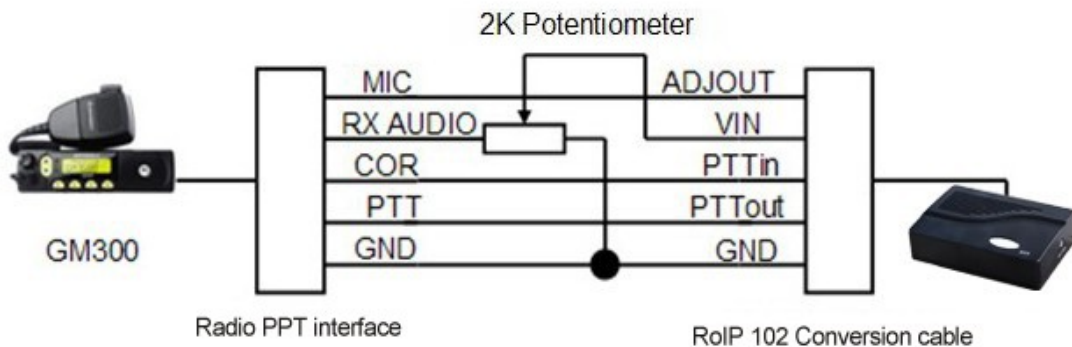
All those terminal involved in the same group must use the same Announce coding.

VIII. Application Examples

Example 1: Linking up two MOTO GM300 Radio terminals in peer-to-peer mode with two RoIP102. The network access method is ADSL.

Operating procedures:

- i. Connect the PTT Interface of the radio terminal (GM300) with the PTT Interface Cable as shown in the diagram below. Connect the RJ-11 plug of the PTT Interface Cable to PTT1 port of the RoIP102.



- ii. Connect the RoIP302 LAN port to an Ethernet port of the ADSL Router
- iii. Assign a fixed IP to the RoIP302 LAN port. This fixed IP must be in the same segment as the LAN port of the ADSL Router. For example: if the LAN of the ADSL Router has an IP 192.168.1.1, then the LAN port RoIP302 could be set to 192.168.1.101.
- iv. Configure the DMZ mode of the ADSL Router to fixed IP assigned to the RoIP302 LAN port. For DMZ configuration, please refer to the User Manual of the Router.
- v. Login to the RoIP Webpage and program the Network Settings as shown below. Please note that the DNS addresses should be programmed as provided by from your local ISP

Network settings:

Network Configuration			
LAN Port	Static IP	PC Port	Static IP
IP Address	192.168.1.101	IP Address	192.168.8.1
Subnet Mask(optional)	255.255.255.0	Subnet Mask	255.255.255.0
Default Route	192.168.1.1	DHCP Server	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Primary DNS	202.96.134.133		
Secondary DNS (optional)	202.96.128.68		

Domain name server address on the above map according to local service providers' domain name server address (DNS) to be adjusted.

GM300 in the PTT (COR) is low input and output RMS,so PTT settings are :

PTT Settings	
<input checked="" type="radio"/> PTT1	
Input Active Level	0
Output Active Level	0
PTT Output Expiry(s)	60

A: set for the host,the number is set to 101,the body number is : ROIP2010060005,DDNS,and call setup is as follows:

DDNS Address	hk.ippcn.com
DDNS Port	39980
Update Interval	600
Domain Name	ROIP20100610005

Remote Control>>

DDNS Settings

Call Settings:

Call Settings	
<input checked="" type="radio"/> Group 1	
Group SIP Number	101
SIP Proxy	192.168.1.101
Register Expiry(s)	300
Authentication ID	
Password	
Auto Dial Number	

Advanced>>
Media Settings>>

B: body number ROIP20100610006,the DDNS and call settings is as follows:

DDNS Address	hk.ippcn.com
DDNS Port	39980
Update Interval	600
Domain Name	ROIP20100610006

Remote Control>>

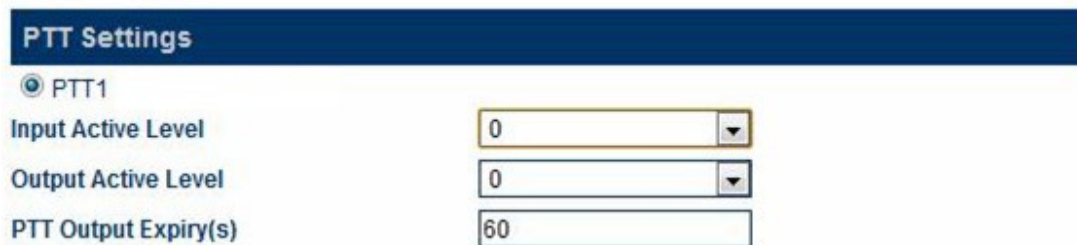
DDNS Settings



The screenshot shows the 'Call Settings' configuration page. At the top, there is a dark blue header with the text 'Call Settings'. Below the header, there is a radio button labeled 'Group 1' which is selected. To the right of this radio button are two links: 'Advanced>>' and 'Media Settings>>'. Below the radio button, there are several input fields: 'Group SIP Number' with the value '102', 'SIP Proxy' with the value 'www.xxx.com', 'Register Expiry(s)' with the value '300', 'Authentication ID' (empty), 'Password' (empty), and 'Auto Dial Number' with the value '101'.

where xxx in www.xxx.com is host A inside the body number,such as ROIP20100610005

Connected to only one radio in two side,so the group set as follows:



The screenshot shows the 'PTT Settings' configuration page. At the top, there is a dark blue header with the text 'PTT Settings'. Below the header, there is a radio button labeled 'PTT1' which is selected. Below the radio button, there are three input fields: 'Input Active Level' with a dropdown menu showing '0', 'Output Active Level' with a dropdown menu showing '0', and 'PTT Output Expiry(s)' with a text input field showing '60'.

Choose the best sound quality for Communications,so both sides have chosen alaw as speech coding:



The screenshot shows the 'Group codec Settings' configuration page. At the top, there is a dark blue header with the text 'Group codec Settings'. Below the header, there is a radio button labeled 'Group 1' which is selected. Below the radio button, there is one input field: 'Codec' with a dropdown menu showing 'alaw'.

Complete the connection,save the configuration after the restart RoIP102,open the Radio,the two place can Communications,After connecting through the respective end of the potentiometer adjustment adjust the volume to the best sound quality (DMZ's Settings,please refer to the router manual).

IX. Hardware Specifications

i. Physical and Operating Conditions

- Dimension: 25 x 14 x 3 cm
- Main Unit Net Weight: 380 g
- Storage Temperature: -40°C - 80°C
- Operating Temperature: 0°C - 40°C

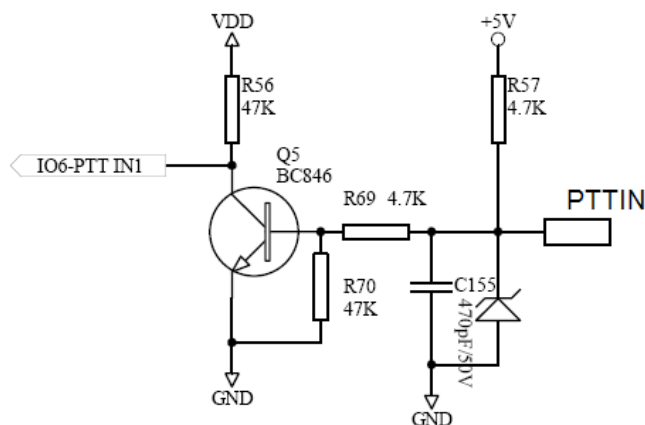
ii. Core Design

- CPU: ARM9
- RAM: 16MB
- FLASH: 4MB
- DSP: 116 MHz, 16 Bit Bus

iii. T Interface

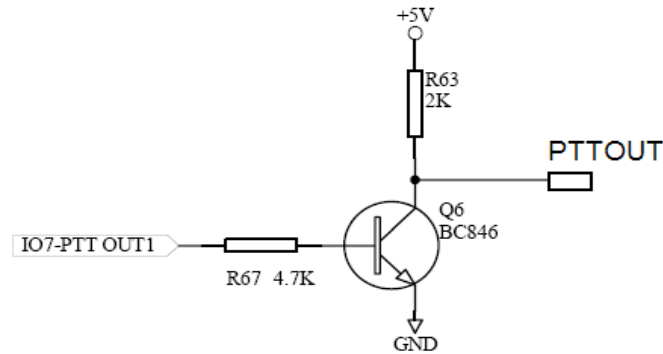
- PTTIN Active Low: <0.7V (4.7K Ω load)
- PTTIN Active High: >1.2V
- PTTOUT High Output: 5V (4.7 K Ω load)
- PTTOUT Low Output: 0V
- APUT Output: 8 Ω 750mW 5V P-P
- AIN Input: 600 Ω Internal Impedance, 0 – 0.6Vp-t-p
- ADJOUT (on the Adapter Cable): 2K Ω Potentiometer
- RAM: 16MB

PTTIN Circuit:



***Based on the circuit above, the PTT Input level is high when it is open ended.**

PTTOUT Cicuit:



iv. Network Port

- Ethernet Port:10/100 Base-T
- Standard Supported:IEEE802.1p
- IP Standard:IPV4

v. Firmware

Item	Description	Remark
OS	Linux	Version 2.6
IP Voice Protocol	SIP 2.0	Include SIP INFO extension
Network Protocol	IP、TCP、UDP、HTTP、ICMP、DHCP CL & SRV、NTP、TFTP、ToS、telnet	
Codecs	G.711 a&μ G.729A G.729AB G.723.1 GSM	
Configuration GUI	Html XML2.0 JAVA	