# USER'S MANUAL

# **Miracall Telephone System TS-208,308,416**

# Owner's Manual - Look Inside For:

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# Warning

- WHEN A FAILURE OCCURS WHICH EXPOSES ANY INTERNAL PARTS, DISCONNECT THE POWER SUPPLY CORD IMMEDIATELY AND RETURN THIS UNIT TO YOUR DEALER.
- DISCONNECT THE TELECOM CONNECTION BEFORE DISCONNECTING THE POWER CONNECTION PRIOR TO RELOCATING THE EQUIPMENT, AND RECONNECT THE POWER FIRST.
- THIS UNIT IS EQUIPPED WITH A GROUNDING CONTACT PLUG. FOR SAFETY REASONS, THIS PLUG MUST ONLY BE CONNECTED TO A GROUNDING CONTACT SOCKET WHICH HAS BEEN INSTALLED ACCORDING TO REGULATIONS.
- TO PREVENT THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.
- TO PROTECT THIS UNIT FROM STATIC ELECTRICITY, DO NOT TOUCH ANY CONNECTORS OF THE UNIT.

1

# Installation & Product Structure

**1.1 Introduction:** The TS series PBX is of 2~4 trunk lines,8~16 extension lines. System support strong protection in lightening weather. The model is most reliable and economical among our product list.

# 1.2 PBX Capacity:

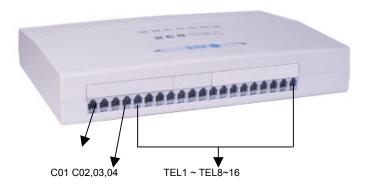
TS-208: Connect 2port PSTN Line, 8port extensions, do not expand.

TS-308: Connect 3port PSTN Line, 8port extensions, do not expand.

TS-416: Connect 4port PSTN Line, 16port extensions, do not expand.

#	Use the:	When you want to
1	Power	The power supply where to connect power cable
2	CO 1,CO2,3,4	The CO line which connect to tranditional PSTN line, total 2,3,4 CO Lines.
3	TEL1~TEL8,16	Extension port from 1~8, 8~16 port, default is 2-digit
4	Ground	For the cable ground connection of lightning protection

# 1.3 System Physical View



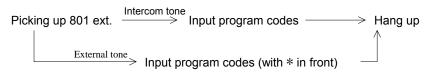
- 1. Check all parts to see whether it is fixed.
- 2. Connect PSTN line to CO ports, and regular phones to extensions.
- 3. Check and connect all cables in all ports to see if the ports workable.
- 4. When power on, the power lighter will turn in red.

# 2

# System Operation

# **Before Operation**

- First read what needs attention before programming (see Warning).
- Programming steps:



- Be sure to re-set the system before switch power on in 1st time.
- Basic Programs:
  - ① Modify the system password for keeping it secret
  - ② Class each extension according to actual needs
  - ③ Set incoming CO Line caller mode (Operator or auto-attendant)
  - $\textcircled{4} \quad \text{Self-recorded voice answer is required if system set in auto-attendant mode}.$
  - ⑤ Enable the CO Line port which connect with external PSTN lines.
- Basic functions:
  - ① Making outgoing/intercom call , Pick up call .
  - ② Incoming call transfer (with pressing the button 'R', hook-switch, or Flash button).

# **4** 2.1. Incoming Call

# 2.1.1 Operator Mode

When there's an incoming call and the desired operator extension rings. If someone pick up the ringing call, he can talk with the incoming caller directly.

#### 2.1.2 Auto-attendant Mode

The auto-attendant mode can receive incoming calls without operator assistant. The caller can dial to the company extension directly without hand-transfer. The function is very practical and useful.

Example: Company record OGM welcome message in PBX system, message like "Hello, it is MIRACALL company, please dial extension number, dial 801 for Sales, dial "0" for Operator ". Incoming caller hear the message and dial 801 or 802 can get the extensions ringing or "0" can reach to Operator extension.

- If no one pick up the ringing extension in 25seconds, system will cut off the line automatically.
- ☐ If caller dial "0" in auto-attendant mode, then the ringing default extension is 802.

# **4.** 2.2. When Making Calls

# 2.2.1 Make Outgoing Call Directly

System provide 4 way to make a call out, including Directly-dial, Dial "0", Press Hook-switch, and Select Desired Line Directly.

Directly dialing-out : Off-hook > on hearing outside tone > dial PSTN Line number. System default setting is in intercom mode when goes off-hook.

# 2.2.1 Make Outgoing Call by Dial "0"

Description	n: Off-hook >Hearing intercom dialing tone > Dial "0" within 5seconds > hearing outside dialing
tone > Dial des	ired PSTN Line numbers.
	System will select the idle free CO Line from CO1,CO2,CO3,CO4 . One by one until find the
	un-busy port.
	Within 8seconds, user should finish input 3-digit ,otherwise system will cut the CO Line
·	connection.
	If user need to Redial: user should input "0" + Pause + PSTN Line number. Otherwise Redial
	button will not be active.
	On hearing Outside line tone, press "*" key to return to Intercom mode.
2.2.2 Select I	Desired Line to Make Outgoing Call
	: Select the free CO Line directly by inputting some code.
•	nook,on hearing intercom dialing tone, input " # M" ,M=CO Line Number(from 1~4) .
	System will freely select the CO Line from CO1,CO2,CO3,CO4 . Such as to input #2 can select
	CO Line 2 or #3 can select CO Line 3;
	On hearing busy tone, the selected Line maybe busy or occupied.
	The feature provided by Telecom Carrier still be valid, like code "*57# or #57#"
2.2.3 Hook-sv	vitch to Make Outgoing Call
Description:	User goes off-hook, press the Hook-switch of the phone ,to select CO line and make outgoing
calls. On hearing	g outside line dialing tone, input the outside numbers or press Redial button.

Hook-switch key: same like **R** key or **FLASH** key.

# 2.2.4 Intercom Call

**Description:** The call between two extensions.

**Example:** Extension 802 off-hook> Hearing intercom dialing tone > input extension number like 806. Then 806 extension will ring. Pickup extension 806,then the two extensions can talk. If 806 is busy then it maybe occupied.

# 2.2.5. Call Splitting

# **Description:**

There's 2<sup>nd</sup> incoming call from same CO Line. The called party will hear a reminding tone. He can hold the 1<sup>st</sup> line and switch to talk with 2<sup>nd</sup> caller. When 2<sup>nd</sup> conversation finished, the called party still can return to talk with holding 1<sup>st</sup> line party.

# Operation:

Hook-switch + "#99"

- ☐ This feature related with service provided by Telecom Carrier.
- The user should be familiar to control Hook-switch time. Otherwise may cut off the line.

# 2.2.6. Boss-secretary Call

**Description:** The Secretary make an outside call reservation for the Boss. Then transfer this conversation to Boss, so that to save the valued time for Boss.

Format: Hook-switch + extension number of Boss

**Operation:** We suppose Secretary extension is 802 (Hereinafter we call A), Boss is 807(Hereinafter we call B), Outside line party is Line C (Hereinafter we call C).

B is Boss and busy every day. A make a call reservation of B. And take some time to connect Line C. A get connected with C then transfer this conversation to B: During conversation with C > FLASH or Hook-switch + B . After transferring the call:

Situation 1.: A still off-hook, and B pick up the ringing extension . Then B talk with A, C hear the on-hold music. When any party of A or B goes on-hook, another party will revert to talk with C.

Situation 2.: A still off-hook, in 25seconds B do not pick up the ringing extension. A will talk to C again. The ringing in B will stop.

Situation 3.: A on-hook, B pick up the ringing extension. Then B will talk to C.

Situation 4.: A on-hook , B do not pick up the ringing extension within 25seconds.

- \* Now if A is free, then the call will ring to A again and B stop. A pick up the ringing extension within 25seconds and conversation with C continue.
- If A is busy then the line C being cut off.

	Whe	en transfer	conversation	with	C to	Party	B, in	5seoncds	Party	A sh	nould	finish	inputting	the
numbers	of Par	ty B, other	wise system w	ill auto	matio	cally re	vert to	o conversat	ion wit	h out	side L	ine C.		

If find problem to Flash or Hook-switch, please refer to Flash-time-setting features.

# 2.2.7. 3-Party Conference Call

**Description:** To establish a conference meeting between 1 CO Line party and 2 extension party.

Format: Hook-switch + \* + Extension number

**Operation:** Extension A connect a conversation with outside CO Line C. Then A press "\* + extension B". So Party A,B,C can call a meeting.

Like Boss-secretary Call feature. Party C will not hear the on-hold-music, but join the conversation with A,B.

If find problem to Flash or Hook-switch, please refer to Flash-time-setting features.

## 2.2.8. Call Pick Up

# **Description:**

Any extension need to pick up other ringing extension (from far away).

**Format: #7** (or \* # 7)

**Operation:** Secretary A is doing some Paper work at extension B which is far from the station. Secretary A can pick up the ringing extension A from extension B far away, by input "#7" only.

Can only allow to pick up external call ringing incoming ,can not pick up intercom ringing.

☐ If secretary A pick up extension B but it is in Outside Line dialing tone, the code to pick up should be

"**\*** # 7"

# 2.2.9. Interrupt & Monitor a Conversation

# **Description:**

The manager can insert into an existing CO Line conversation .

Format: #9M , (M=1~4, the CO Line number)

The code should be used in extension 801 only.

lt do not cut off the conversation.

# 2.2.10. Self-report the Extension Number

# **Description:**

To find the physical extension number in the phone set when some one do not know the actual extension number. The system use "beep" "beep" to act as digit or numbers.

For example: Extension 801, you will hear 8 "beep" ,after 1.5seconds ,you hear 10 "beep", then after another 1.5seconds, hear 1 "beep"

• Format: #81 (or \* #81)

System use 10 "beep" to stand for digit "10".

# 2.2.11. Call Forwarding

**Description:** In Auto-attendant mode, any call to Extension A can be forwarded to Extension B.

**To Set:** # \* abc , (abc=801~816, extension number)

**To Cancel:** Extension goes off then goes on-hook for one time.

The feature is un-valid in Operator status.

The feature is useful when the colleague leave the office A to office B. So the colleague can receive the calls to his original extension number.

# System Programming

#### **Remarks**

- 1. All program should be set in extension 801 only.
- 2. Can continuously input the system code or press "\*" to re-input code if find mistake ,without stop or without on-hook,.
  - 3. The program code start with "\*" and end with "#"
- 4. After the setting program, you will hear 1 "du..". If you hear "-du,-du, which means the input is wrong.
  - 5. During program, other extensions should stop use or disconnect with main PBX, to make sure the

success of the program.

# **3.1.** Login in System Program

**Description:** Extension 801 enter into system program mode to start system program.

# Setting code:

- \* \* 01ABCD #, (ABCD = 2008, original password),
- ☐ The system program extension should be "801".
- $\square$  If extension 801 goes on-hook, then system program is stopped . You need to input system password again.

# **4.** 3.2. Change System Program Password

**Description:** User may need to change the system password when get a new PBX for security matter.

# Setting code:

- \* 02ABCD #, (ABCD = new password),
- Suggest to change the password before program, and keep the new password safely.
- If forget new password, please contact local agent or factory for help.

**44** 3.3 Enable CO Line Port

**Description:** Allow you to open the CO Line port when need to connect physical PSTN Lines.

# Setting code:

\* 3M #, (M=1,2,3,4, the desired port which user want to enable)

**Operation:** Some company has 4PSTN Lines from Telecom Carrier and need to connect with TS-416.

- 1. Extension 801 goes off-hook, and input "\* \* 01 2008".
- 2. Input "\* 3 1234# ".
- 3. Goes on-hook after hearing 1 "-du"
- User can enable or disable the CO Line port freely.
- ☐ You can also disable all CO Line port, using code "\*\* 3 # ",so the PABX can use as Intercom System.

# **3.4.** CO Line Group

3.4.1: Setting Exclusive Line 1, exclusive line of some extensions

**Description:** Some extensions allow to use some fixed line only.

## Setting code:

\* 41M abc #, (M=1,2,3,4 CO Line port, abc = extension numbers),

Can set max. 4 extensions for 1 CO Line only;
$\square$ To cancel the exclusive authority, you need to use code $*$ 3M # to enable .
3.4.2: Setting Exclusive Line 2, some extension can only use some line
Description: Some extension allow to use some fixed line only.
Setting code:  * 42M abc # , (M=1,2,3,4 CO Line port, abc = extension numbers),
$\square$ To cancel the exclusive authority, you need to use code $*$ 3M # to enable .
3.4.3: Setting Ringing Extension
Description: To set which extensions to be ringing for incoming call.
Setting code:  * 1M abcd # , (M=1,2,3,4 CO Line port, abcd = last digit of ringing extension numbers),
<ul> <li>□ 801~804 will ring in factory setting .</li> <li>□ The ringing extensions can only be selected from extension 801~808</li> <li>□ Max. 4pcs of extension can ring at same time for 1 incoming call. If less than 4pcs, then use "#" as instead. Such as "* 1M abc# #", "* 1M ab## #" etc.</li> </ul>

# **3.5.** Setting Operator Mode

# 3.5.1: Operator Mode Setting

Description: The assigned extension will ring in Operator mode. You can pick up the call to answer or transfer it to another extension.

# Setting code:

\* 21 #

## 3.5.2: Set all Line in Auto-attendant Mode

Description: In auto-attendant mode, the caller can dial the extension directly when hear welcome message. No need the Operator transfer manually.

# Setting code:

\* 20 #

If dial "0" then the call will route to Operator extension.

#### 3.5.3: Set some Line in Auto-attendant Mode

Description: User can choose which line In auto-attendant mode, or which line in Operator mode.

Setting code:  * 20M # , M=1~4(CO Line number)
Suggest to use code "*21#" to enable all lines in Operator mode, then use "* 20M #" to set one line in Auto-attendant mode.
3.5.4: OGM Recording
<b>Description:</b> In auto-attendant mode, the incoming Caller will hear the welcome message, which is called OGM (Outgoing Message). User can use the handset to record the custom message.
Setting code:  * 22 #
You can record the message like "Hello,this is xx company,sales dial 802,technical 805, operator dial 0".  The duration for OGM record is 12seconds, user will hear "-du" before record and will hear another "-du" after 12seconds.  You can record the message in un-limited times, and the new record will cover the old message automatcially.

3.5.5: OGM Playing

If the caller start to dial number during the welcome message ,then the message play will stop.

Dial "0" when hearing message, the call will route to Operator extension 802.

<b>Description:</b> User can check the OGM record result by this feature.
Setting code:  * 23 #
The testing playing OGM is for reference only, which maybe different in actual situation.  After testing ok, you can set system in Auto-attendant mode. (code: * 20 #).
3.5.6: Music Playing
<b>Description:</b> User can check the On-hold music result by this feature.
Setting code:  * 24 #
3.5.7: Setting 1 <sup>st</sup> Operator Extension
<b>Description:</b> User can set the first ringing Operator extension for PBX.
Setting code:  * 25 abc # , abd=801~816 ( extension number)
The factory first Operator extension number is 802 .

# 3.5.8: Setting 2<sup>nd</sup> Operator Extension

**Description:** User can set the second ringing Operator extension for PBX,when first Operator is busy.

# Setting code:

- \* 26 abc #, abd=801~816 (extension number)
- When first Operator is busy, user dial "0" will switch the call to 2<sup>nd</sup> Operator extension.
- ☐ If the two Operators are both busy, then system will ringing to one of free extension among 802~808.
- For intercom call, the call to busy Operator 1 will not switch to Operator 2 but only hear the busy tone.
- System factory 2<sup>nd</sup> Operator extension is 803.

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# 3.6. Class of Service

# 3.6.1: Setting Service-class for Some Extension

**Description:** Allow to set different class of authority to dial make outgoing calls.

# Setting code:

- \* 51 abc n #, abd=801~816 ( extension number)
- n=1, the extension can make any long-distance call (free call);
- n=2, the extension can't make international long-distance call;

- n=3, the extension can't make national long distance call;
- n=4 , the extension can't make call starting with Restriction-Leading-Digit in Group A;
- n=5, the extension can't make call starting with Restriction-Leading-Digit in Group B;
- n=6, the extension can make intercom call only;
- n=0, the extension can only make call of specially-allowed digit;

# 3.6.2: Setting Service Class for All Extensions

**Description:** User can set the second ringing Operator extension for PBX,when first Operator is busy.

# Setting code:

- \* 51 n # , n=0~6 ( same as above at item 3.6.1)
- This code all user to set the extension class of service promptly.

# 3.6.3: Enable Civic-Leading-digit Call Restriction- Group A

**Description:** To set the restriction leading digit related with Class of Service 4.

## Setting code:

- \* 52 abcd # , ( abcd is the leading digit of the phone numbers)
- The digit can be 1~4 numbers,end of "#".
- Can restrict max. 10-group digits .

The restricted leading digit only available for class of service 4.
3.6.4: Disable Civic-Leading-digit Call Restriction- Group A
<b>Description:</b> To cancel the Group A leading digit restriction
Setting code:  * 52 #
Suggest to use this code to clear all setting before changing the restricted leading digit.
3.6.5: Enable Civic-Leading-digit Call Restriction- Group B
<b>Description:</b> To set the restriction leading digit related with Class of Service 4.
Setting code:  * 53 abcd # , ( abcd is the leading digit of the phone numbers)
<ul> <li>The digit can be 1~4 numbers,end of "#".</li> <li>Can restrict max. 10-group digits .</li> <li>The restricted leading digit only available for class of service 5.</li> </ul>

3.6.6: Disable Civic-Leading-digit Call Restriction- Group B

**Description:** To cancel the Group B leading digit restriction..

Setting code:  * 53 #
Suggest to use this code to clear all setting before changing the restricted leading digit.
3.6.7: Enable Assigned Leading-digit
<b>Description:</b> After restricted call service, like locking long-distance call in service 2, but you still want to dial some few special long-distance call numbers. Allow to open some part of authority within the closed service.
Setting code:  * 54 abcd # , ( abcd is the specially assigned leading digit)
The digit to lock long-distance call should be less 4 numbers, eg "0757", "075x", "07xx" using "#" to make up if less 4-digit.
The digit to lock civic call should be less 3 numbers, eg "800", "80x", "8xx" using "#" to make up if less 3-digit.
Example: Restrict 808 extension only can dial intercom, but need to dial some city like Pecking (area code 010). Guangzhou (area code 020).

- 1. Login in System Program Mode: Extension 801 off-hook, input " \* \* 01 2008 # ";
- 2. Restrict 808 in Service Class 0: input " \* 51 808 0 # ";
- 3. *Disable city code 010 in Pecking*: input " (\* 54) 010 # ";
- 4. Disable city code 020 in Guangzhou: input " (\* 54) 020 # ";

SO in extension 808, now it can only dial numbers like 010xxxxx, 020xxxxx.

# 3.6.8: Disable Assigned Leading-digit

**Description:** After restricted the assigned leading-digit, user want to change or cancel this feature setting.

# Setting code:

\* 54 #

Suggest to use this code to clear all setting before changing the restricted leading digit.

# 40

# 3.7. Extension Flexible Numbering

# 3.7.1: Change Extension Number

**Description:** Allow to modify the factory or existing extension number in PBX.

# Setting code:

\* 6 abc ABC #,

abd=801~816 (original extension number), ABC=100~999 (New extension number).

	The new extension number ,ABC ,should be within number "" The new extension number can not be same as existing one.
3.7.	2: Restore Extension Number
Des	<b>cription:</b> Allow to restore the extension numbers to factory status (from 801~816).
	ing code: 000 # ,
	You can restore all extensions number before you make modify or change .

# **3.8. Extension Flexible Numbering**

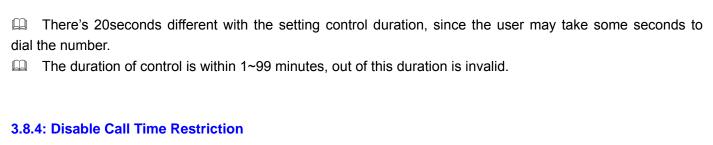
# 3.8.1: Dial-out Mode Assignment

**Description:** Allow to set the code/mode for extension to access Outgoing PSTN Calls.

# Setting code:

```
* 8 abc n # , abd=\mbox{ abd= extension number (801~816 \ ),} \\ n=\mbox{dial "0" out or Hook-switch out. (when n= "0").} \\ n=\mbox{directly dial out. (when n= "1").} \\
```

In factory	setting, all extension is in "Dial 0 out ", or "hook-switch out"
(Out" here	e means: the intercom extension user to dial outside PSTN number.
3.8.2: Restore	all Extensions Dial "0" Out
Description: A	Allow to re-set system dial out mode to factory status, that is "dial 0 or hook-switch out".
<b>Setting code:</b> * 8 000 # ,	
The code	is in fact part-reset system.
3.8.3: Call Tim	ne Restriction
Description: A	Allow to control extension users do not occupy the conversation and telephone line for long time.
Setting code: * 9 abc MN # ,	
	abd=801~816 (extension number which under call time control), MN=01~99 ( Minutes, time).
	/.



**Description:** Allow to cancel the call time restriction control.

# Setting code:

\* 9 abc #,

abd=801~816 (extension number which under call time control),

The setting should be done in extension 801.

# **3.9.** Setting Flash Time

**Description:** Allow to set flash time for call transfer or hook-switch.

# Setting code:

\* 81 m #,

m=300~2000ms (flash time), m=1 (750ms),

m=2 (1000ms), m=3 (1200ms), m=4 (1500ms), m=5 (2000ms), m=6 (300ms),	
The factory flash time is 1000ms.	
The code related with features like Call Transfer, Conference Call, Boss-secretary call ,which nee Hook-switch or dial Flash/ R key in the phone set.	ed to use
◆◆ 3.10. System Return to Factory Status	
<b>Description:</b> Allow to re-set system to default.	
<b>Setting code:</b> * 7000 # ,	
<ul><li>The code do not re-set the new extension number ,you can use code in 3.7.1.</li><li>The code will clear the CO Line Group setting.</li></ul>	



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# **4.1. Enable or Disable CO Line Port**

1	Operator Mode	Operator
2	Incoming call ringing extension	801, 802
3	CO Line Group	nil
4	Class of Service	2
5	Civic restrict leading digit	nil
6	Extension numbers	801~816
7	Extension dial out mode	Dial "0"

# **4.2.** System Program List

NΩ	Command	Function
1	**01 2008#	Login in system program mode by using password " 2008"
2	*02 ABCD#	Change factory password to new "ABCD"
3	*3M#	Enable CO Line Port, (M =1,2,3,4)
4	*41N abc#	Set CO Line "N" as exclusive line of extension "abc"
5	*42M abc#	Set extension "abc" can only use CO Line "M"
6	*1M abc#	Set incoming line "M" ringing to extension "abc"

NΩ	Command	Function
7	*21#	Set system in Operator mode
8	*20#	Set system in Auto-attendant mode
9	*20m#	Set line "m" in Auto-attendant mode
10	*22#	OGM/DISA Recording
11	*23#	To play OGM recording in phone set
12	*24#	To play on-hold music
13	*25 abc#	Set 1 <sup>st</sup> ringing Operator extension "abc"
14	*26 abc#	Set 2 <sup>nd</sup> ringing Operator extension "abc"
15	*51 abc n#	Set extension "abc" in Class of service "n"
16	*51 n#	Set Class of service for all extensions (class n )
17	*52 abcd#	Restricted leading-digit, Group A ("abcd" is the leading digit )
18	*52 #	Cancel Group A restricted leading digit
19	*53 abcd#	Restricted leading-digit, Group B, ("abcd" is the leading digit )
20	*53#	Cancel Group B restricted leading digit
21	*54 abcd#	Specially allowed leading-digit ("abcd" is the digit assigned)
22	*54#	Cancel the specially allowed leading-digit
23	*6abc ABC#	Change old extension "abc" to new extension number "ABC"
24	*6000#	Restore extension numbers

NΩ	Command	Function
25	*8abc n #	Set extension "abc" dial-out mode (n=0,1)
26	*8000#	Restore all extension dial "0" out
27	*9abc MN #	Set extension "abc" call time control for only "MN" minutes
28	*9 abc #	Cancel extension call time control
29	*81M #	Set hook-switch flash time (300ms ~2000ms)
30	*7000#	Reset system to factory status

# **4**0

# 4.3. Trouble Shooting

	Descriptions	Reasons Possible	Solutions
1	Operation lighter off	No power supply	Check the cable
2	No dialing tone for extensions	Cable or telephone set problem	Check cable and phone set
3	Phone set voice not good	Different phone set use together	Replace to better quality phones
4	Line cut off when talking	Set call time restrictions feature	Reset the feature
5	Others	others	Refer to agent or factory

# 40

# 4.4. Technical Specifications

Power supply: 220VAC,50Hz Power Consumption: less of 20VA

Type of phones: DTMF

Feedback power: DC48V,20~30mA Ringing-back tone: AC70V,50Hz

Intercom dialing tone: 450Hz, continuous

# **4**\$

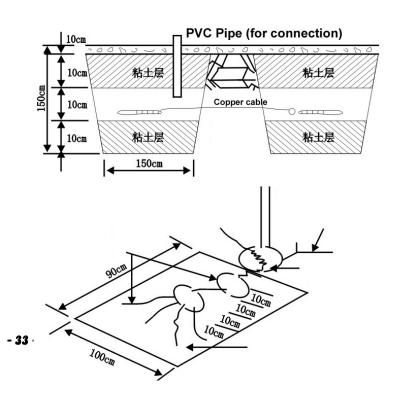
# 4.5. **Ground Connection**

System should work based on reliable voltage. Suggest to connect the PBX System with independently power supply.

Please use MDF case to connect with external line and external line part ,and arrange well with ground resistance (less than 50).

Solution A: by Copper Sheet, 90cm length, 2mm thickness. The ground and connection is suggested in beside picture:

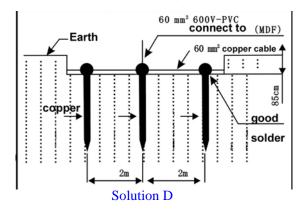
# Solution A

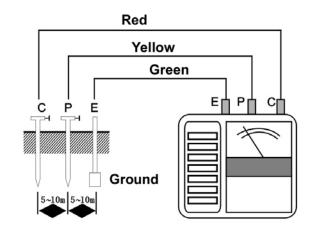


Solution B: Ground Resistance Testing. Testing machine: KYORITSU 4102 C,P,E should be in line

Solution C: By single Copper Stick , the stick should be 180cm length, 13mm diameter. Better to select some wet earth to make the ground. The joint of the stick and cable can use soldering with silver

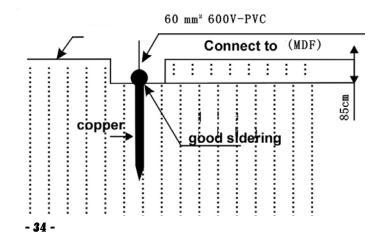
Solution D: By Copper Stick In Line, the stick should be 180cm length, 13mm diameter. The distance between the stick can be 2cm,Better to select some wet earth to make the ground. The joint of the stick and cable can use soldering with silver.





Solution B

Solution C



The serial number of this product may be found on the label affixed to the side of the unit. You should note the		
-		

The serial number of this product may be found on the label affixed to the side of the unit. You should note the model number and the serial number of this unit in the space provided and retain this manual as a permanent record of your purchase to aid in identification in the event of theft.
MODEL NO.:
SERIAL NO.:
DATE OF PURCHASE
NAME OF DEALER
DEALER'S ADDRESS