TERRACOM™

SIP-Based Audio over IP

User Manual v5.03

Firmware Version
v3.0.3.2
v3.0.3.1
v3.0.2.81
v3.0.2.67
v3.0.2.57
v3.0.2.44

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1 About This Manual

This manual is intended to provide with the necessary understanding of our system architecture as well as guide users through the configuration process.

1.1 Safety Instructions & Declaration

- Do not expose the device to extreme temperatures, direct sunlight, humidity, or dust, which could cause fire or electrical shock hazard.
- Keep away water or other liquids from the device. Otherwise fire or electrical shock may result.
- Connect the power cord only to an AC outlet of the type stated in this owner's manual or as marked on the unit. Otherwise fire and electrical shock hazard results.
- Avoid touching power plugs with wet hands. Doing so is a potential electrical shock hazard.
- Take care for correct polarity when operating the device from a DC power source. Reversed polarity may cause damage to the unit or the batteries.
- Avoid placing heavy objects on power cords. A damaged power cord is a fire and electrical shock hazard.
- Do not cut, scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard. Ask your TERRACOM dealer for replacement.
- Turn off immediately the unit, remove the power cord from the AC outlet and consult your TERRACOM dealer in any of the following circumstances:
    - Smoke, odor, or noise getting out of the unit.
    - Foreign objects or liquids get inside the device.
    - The unit has been dropped or the shell is damaged.
    - The power cord is damaged.
    - If you continue using the device, fire and electrical shock may result.
- Do not drop or insert metallic objects or flammable materials into the unit as this may result in fire and electrical shock.
- Do not remove the device's cover, as there are exposed parts inside carrying high voltages that may cause an electrical shock. Contact your TERRACOM dealer if internal inspection, maintenance, or repair is necessary.
- Do not try to make any modifications to the device. This is a potential fire and electrical shock hazard.
- Avoid the device's ventilation slots to be blocked. Blocking the ventilation slots is a potential fire hazard.
- To prevent the unit from falling down and causing personal injury and/or property damage, avoid installing or mounting the unit in unstable locations.
- Leave enough space above and below the unit to provide good ventilation of the device. If the airflow is not adequate, the device will heat up inside and may cause a fire.
- Operate the device in an environment with a free-air temperature of between -5ºC ~ 55ºC (23ºF ~ 131ºF).

- Turn off all audio equipment when making any connections to the device, and make sure to use adequate cables.
- Do not use benzene, thinner, or chemicals to clean the device. Use only a soft, dry cloth.
- If the device is moved from a cold place (e.g., overnight in a car) to a warmer environment, condensation may form inside the unit, which may affect performance. Allow the device to acclimatize for about one hour before use.

1.2 Notice Signs

There are two types of signs can be used in this manual. The type is closely related to the effect that may be caused if it is not observed.

 Note: Containing additional information.

 Caution: The equipment or the property can be damaged, or persons can be lightly injured if the alert is not observed.

2 System Overview

- Why IP?

  The audio over IP technology has the huge advantaged to be able to use this existing network and to cross easily routers and even use the internet.

- Where to Use It?

  From the standard applications like shopping malls, hotels, museums, theme parks, hospitals, schools to more tricky and original applications, IP networks are everywhere.

- Powerful Platform

  The Terracom devices have a powerful processor. You will find a remarkable list of features like priority management, backup management, event management, scheduler, local channel and volume control, paging, echo cancellation, noise reduction.

- Audio Streaming

  Terracom offers the possibility to stream using the standard RTP protocol in unicast, multicast or broadcast. For some applications, like the In-store, the Terracom can stream using shoutcast/ icecast protocols.

- SIP Benefits

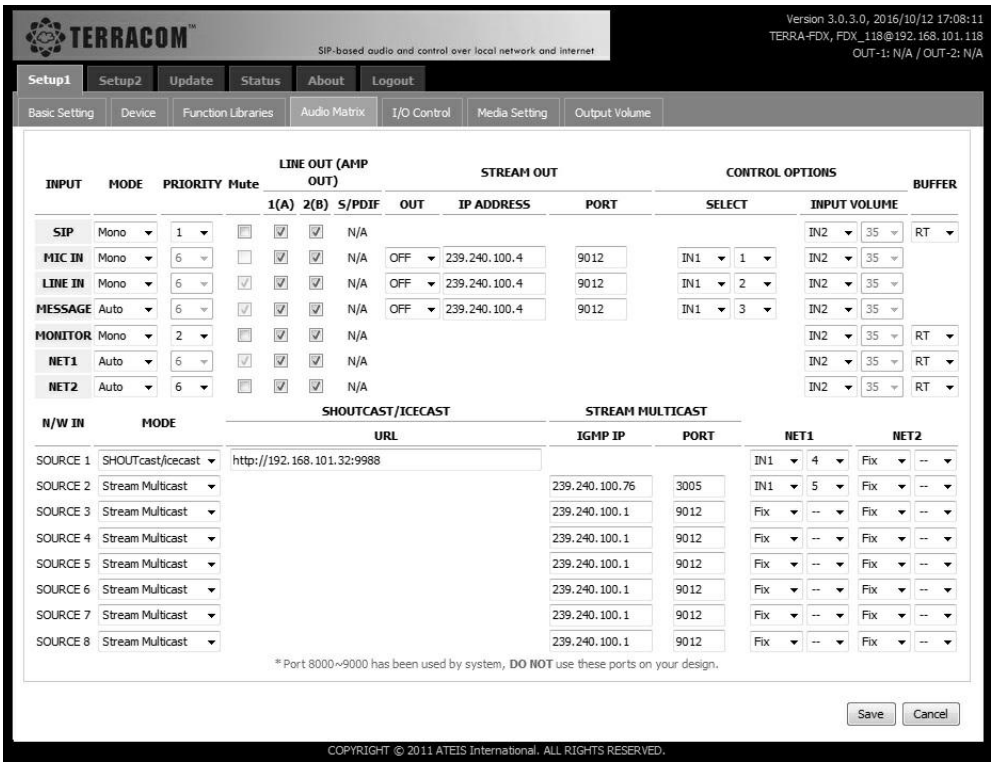
  All Terracom devices are using the SIP technology. It brings you the benefit to have a standard session protocol which can be compatible with IP PBX & soft phone.

- PoE Benefits

  All Terracom devices support the PoE (Power Over Ethernet). With PoE, the constraint of having AC power outlets is eliminated. This provides flexibility in placing Terracom devices in the most optimal locations instead of choosing locations where power is available. Optimal placement leads to more efficient network designs and better application performance. And if one day you want to change the location of your Terracom, it would be easier. The network installation can be accomplished easier, faster and for less cost. It is also safer because you can centralize the power management and protect it with an uninterruptible power supply (UPS). At last, use a manageable PoE network switch via web browser or SNMP allows the remote networking devices to be easily reset or shut down which saves the time and expense of dispatching a technician.

- Management

  Terracom embeds a web interface that enables you to control the Terracom through your favorite internet browser. For bigger system, you can use the SNMP protocol. For more complex system, the TerraServer will be your supervisor and the management solution of your installation.



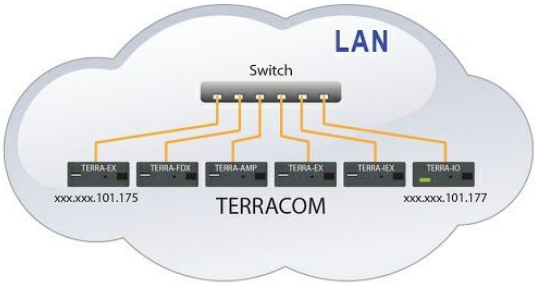
❖ Features

- 10/100MB Ethernet with RJ45 and CAT-5 connection.
- Power supplied via PoE or 24VDC power adapter.
- Simplify the installation, up to 9999 stations per system.
- Support TCP, UDP, SIP, RTP, IGMP, HTTP, DHCP, NTP and SNMP protocols management.
- G.711, G.722, G.726, G.727, G.729, MP3 audio codec and AAC+ decoder.
- Group calls, all call with or without chime.
- Manual and automatic call transfer from station to station and to telephone network.
- Multiple logic IO control.
- Integrated graphic user software-TerraManager for monitoring and fault reporting of all system components.
- TerraServer management software for site redundancy.
- Web browser interface for device control and monitoring.
- Logic input: pre-defined call, a contact output activation. RS232 serial string generation, an alarm. fault display.
- Access control (remote door lock down).
- Full duplex with echo cancellation.

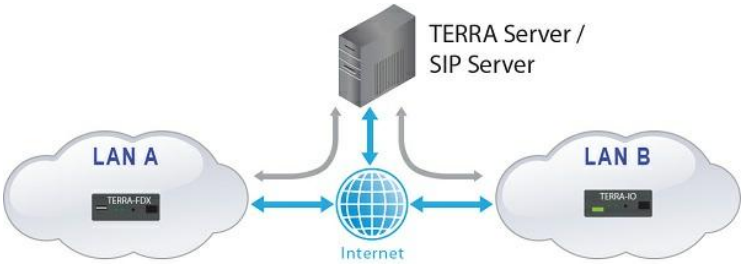
2.1 System Network

There are 3 ways for Terracom to communicate with each other.

LAN

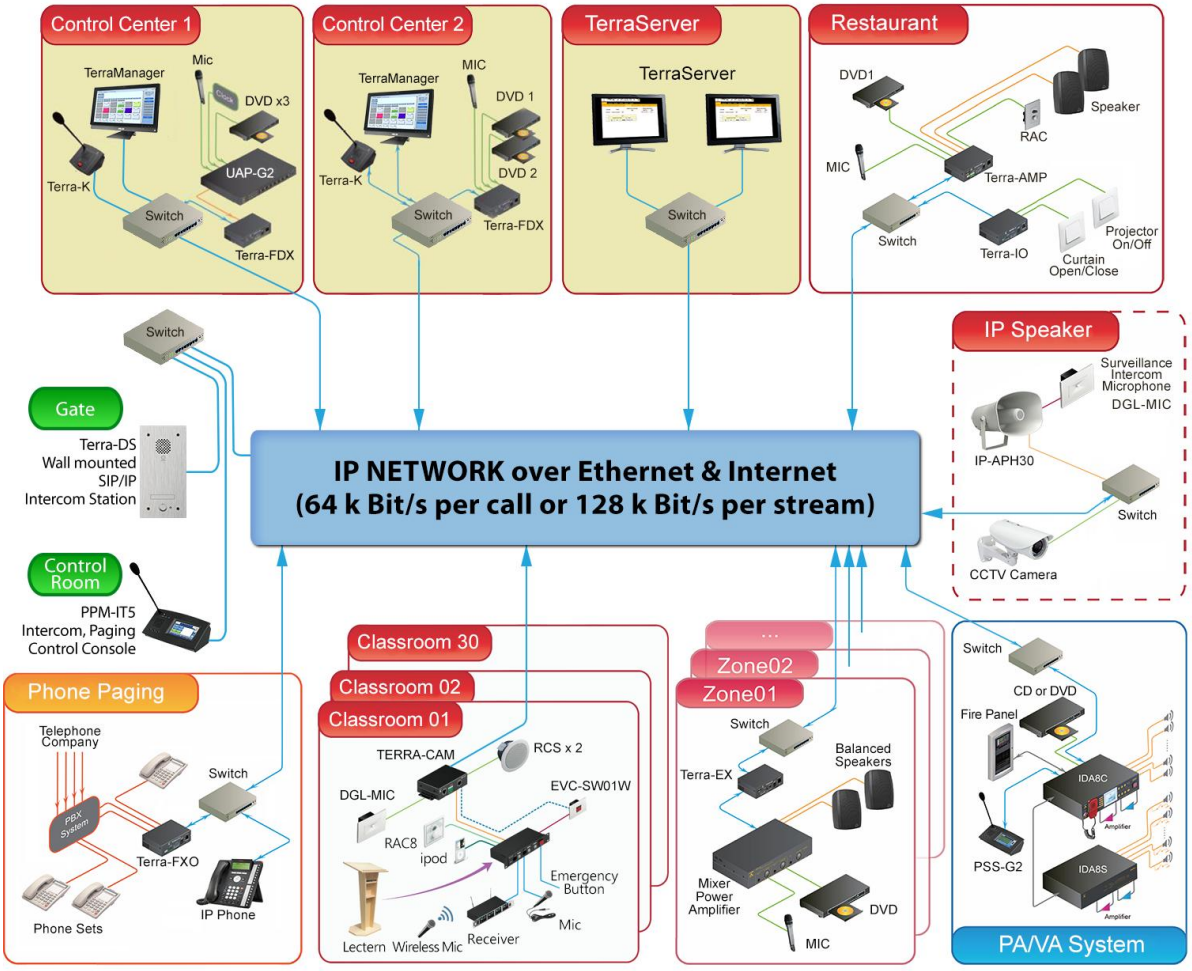


Over Internet



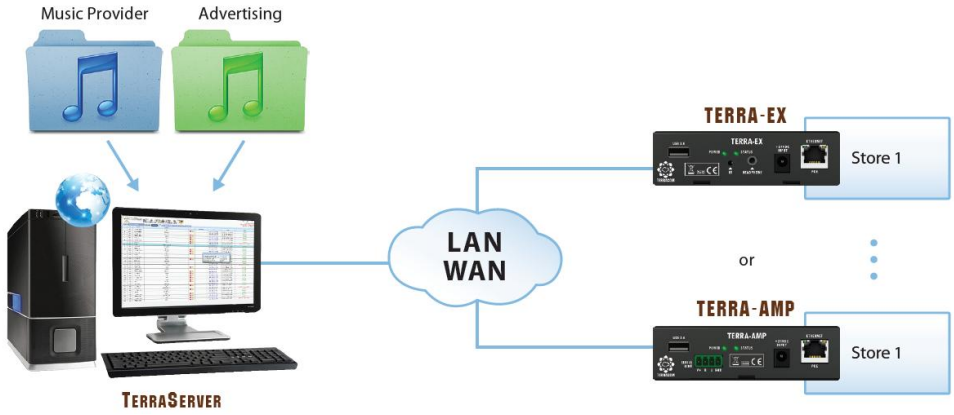
Over Internet via Static Routing Table in NAT

2.2 Applications



2.2.1 In-Store

Use the Terracom devices to perform music and advertising messages at each shop. The TERRACOM device will receive the messages and schedule from TerraServer, and store them on the USB flash memory and play the messages on time.



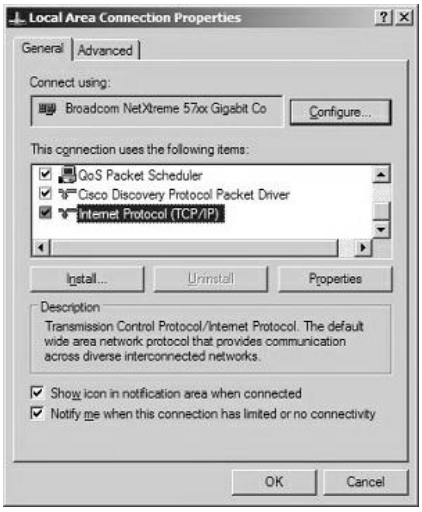
3 Quick Start

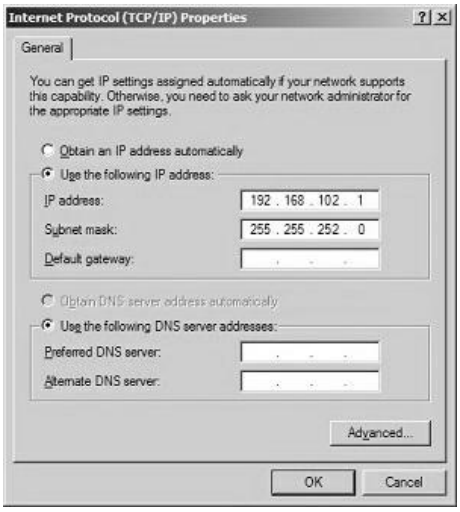
Here is a simple demonstration showing how to connect to your Terracom device and perform an IP call. Each Terracom device comes with a default configuration.

1. Assign IP address to PC:

   Each Terracom device is shipped from the factory with a default IP address of 192.168.102.10. For more information, see IP Address 40 chapter.

   Then, your PC must have an IP address like 192.168.102.x (x is a value between 2 & 254).





2. Power Connection:

   The Terracom device can be powered by PoE 48V via CAT-5 cable. For that you will need a PoE switch. Otherwise, the device can be powered by an external DC-JACK 24V-0.25A power supply. Once the unit is powered on, the Power LED on the device will light up.

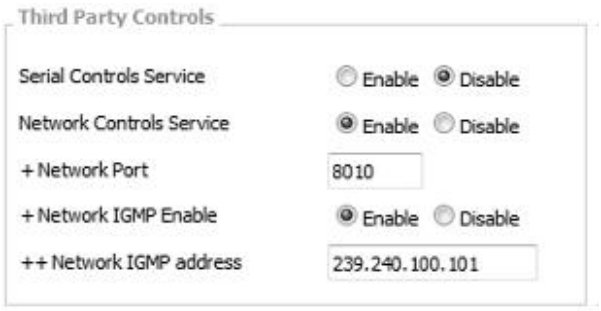
3. Network Connection:

   Use a straight CAT-5 cable to link your PC network card to the device. Open your favorite web browser (we recommend Mozilla Firefox). Type the IP address (By default: 192.168.102.10) into the address bar. You will be asked for a login. There are two default account settings, see as below. After login, you can start to operate the Terracom web inteface.

   - Login: admin
   - Password: admin

4. Assign IP address to Terracom Device:

- Change the IP address of your device at "Setup1 > Basic Setting > Network". After the settings has been saved, the Terracom unit will auto reboot.



Note: You might need to change the IP settings of your PC network card to be in the same network mask as the new IP address of your Terracom. To avoid the conflict issues when connecting multiple Terracom devices with the same IP address, be sure to only connect one Terracom device at a time to the Ethernet switch when assigning IP addresses.

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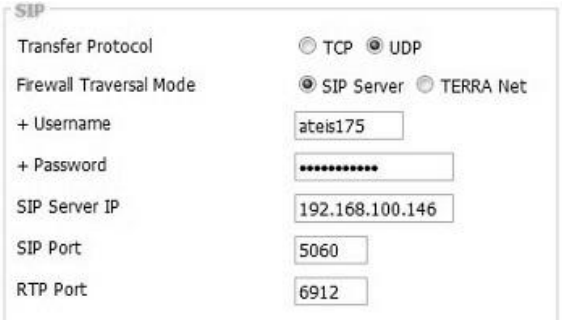
5. SIP Server Setting:

- With SIP server:

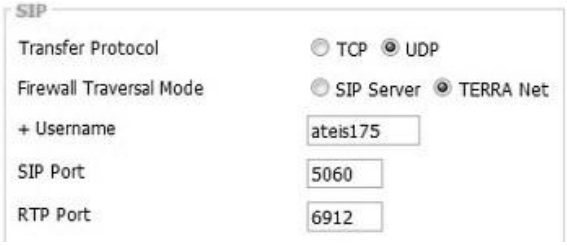
  The audio streaming can be done using a SIP Server. Go to "Setup >Basic Setting >SIP" and enter the settings of your SIP server.



- Without SIP server:

  If you don't have a SIP server, please follow the settings as below,

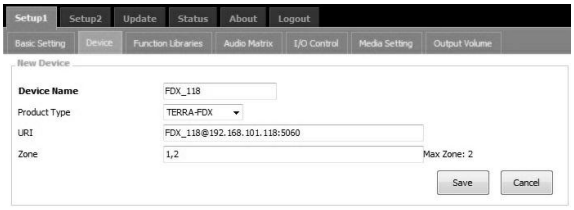
  - Firewall Traversal Mode: TERRA Net
  - SIP Port: 5060
  - RTP Port: 6912



6. Device:

   Add the Terracom device you want to call into the Address Book at "Setup1 > Device > Add New Device".

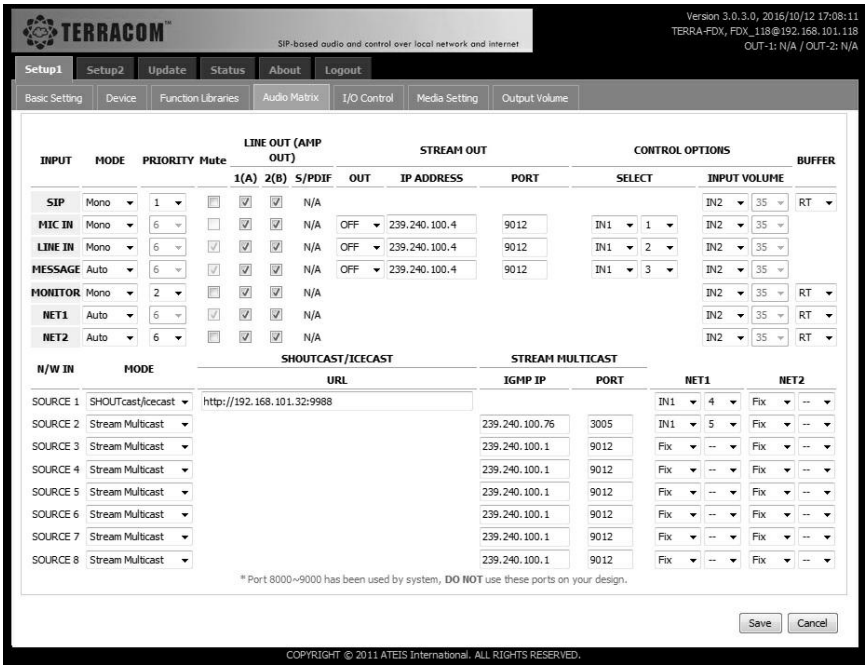
- Enter name_device@XXX.XXX.XXX.XXX:YYYY in the URI field.
  - For a SIP call: XXX.XXX.XXX.XXX = the SIP server IP address.
  - For a direct call: XXX.XXX.XXX.XXX= the IP address of the device we want to call.
  - YYYY= the SIP port number you have entered in the SIP settings.



7. Audio Output Matrix:

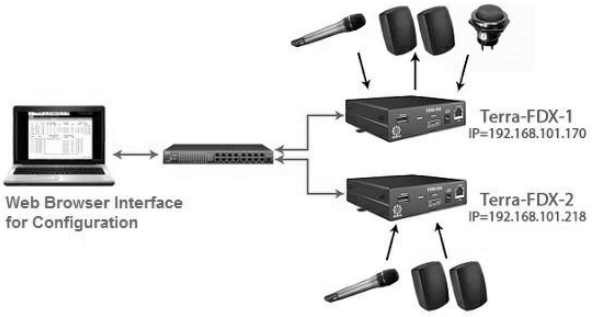
In the Terracom unit, there is a priority table. You can decide which inputs (SIP call, playlist stored on the USB key, IP streams, mic/line inputs) will be played on the output.

Always set the highest priority for SIP call.

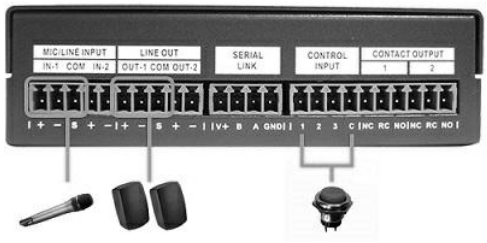


8. How to generate an IP Call:

- With the Terracom unit, you can also generate an IP stream. Here we use a simple example, one Terra-FDX call the other Terra-FDXs.



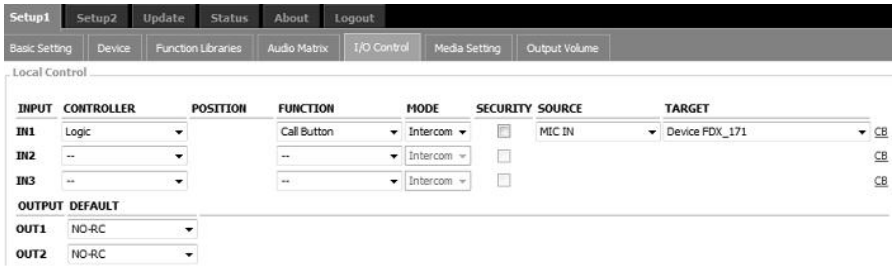
- Connect the Terra-FDX with the following: One mic to MIC-IN connector, one speaker to Line-Out connector and a push button to Control input (1 and GND) as shown in the picture below:



- Finished the step1-4 (IP setting) with two Terracom devices, now follow the steps below to perform an IP call:

1. Add Terra-FDX-2 into Terra-FDX-1's address book at "Setup1 > Device List", click the [Save] button.
2. Add a Call function at "Setup > Function Libraries > Device Group". Choose the device and click the [Save] button.

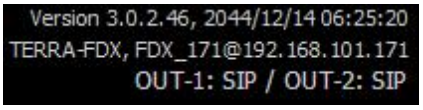
3. Set the button control as shown in the picture below at "Setup > I/O Control" and save the setting.



- Controller: Choose "Logic".
- Position: N/A.
- Function: Choose "Call Button".
- Source: Choose "MIC IN".
- Target: Choose the target.

4. Enable the "SIP Auto Answer" at the TERRA-FDX-2's "Setup1 > Basic Setting", here we choose "MIC" IN to fit the physical connection.

5. Press the button and the Terra-FDX-1 will call Terra-FDX-2, now you can hear from the speaker and speak to the Terra-FDX-2 through the mic, and vice versa.



6. During the SIP call, both two Terracom devices show the information at the upper-right part of the page.

4 System Hardware

4.1 TERRA IP Audio Decoder

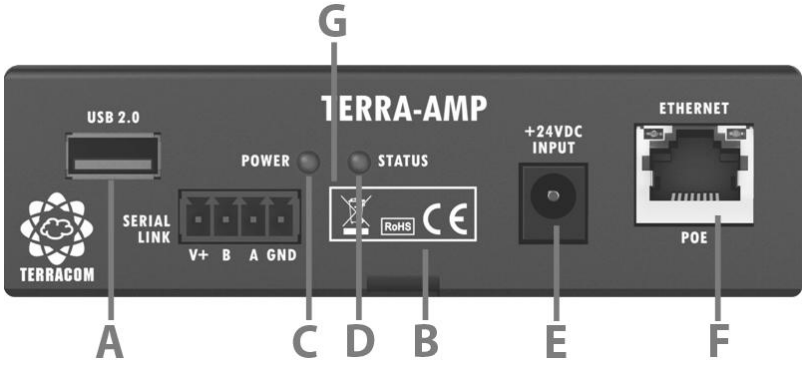
4.1.1 TERRA-EX

TERRA-EX is an IP audio decoder with an optional USB 2.0 interface for playlist backup or prerecorded announcement. The TERRA-EX has proposed as the most cost-effective output device which comes with 2 independent balanced line outputs, 1 contact output, 3 contact inputs, this makes TERRA-EX an ideal IP solution for any applications where you need a simple balanced audio output with some I/O contacts & relays.

The shoutcast/icecast decoding, USB backup, scheduler and the advertising management which make TERRA-EX is a perfect product for retail shops, too. The volume and the channel can be modified locally by connecting to a remote source selector such as RAC remote controller.

The TERRA-EX uses G.711, G.722, G.726, G.727, G.729, MP3 codec and AAC+ decoder. Network sources and volume controls can be implemented thanks to the analog inputs. Priority management, volume control, event management & scheduler can be easily setup via any of your favorite web browser.

4.1.1.1 Front Panel



Ⓐ USB Type A Female Connector:

2.0 USB interface for music, message and recording.

Ⓑ Power LED:

The power LED lights up when the TERRA-EX is powered on.

Ⓒ Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

Ⓓ Headphone Connector:

A stereo line output (3.5 mm mini jack) for headphone.

E 24VDC Input:

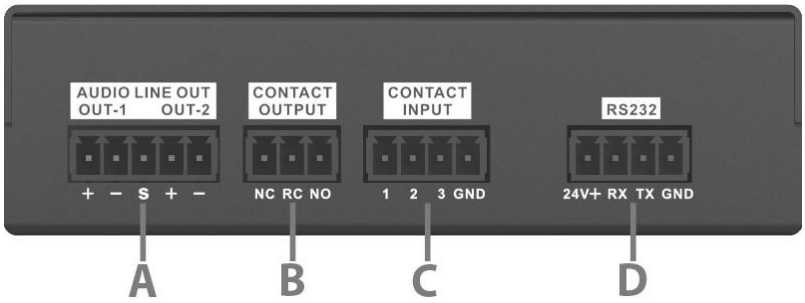
24VDC power supply input (if no PoE available).

F Ethernet/POE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

G IR Receiver [Not in Use]

4.1.1.2 Rear Panel



A Audio Line Out (balanced audio output):

If you want to use unbalanced signal, connect the Cold (-) pin with the Shield (S) pin.

S: Shield, +: Hot audio signal, -:Cold audio signal.

B Contact Output:

The contact output which can be programmed and send a pulse or a static closing/opening to an external device. When the device is powered on and working properly, the NC (normally open) contact is closed and the NO (normally open) contact is open.

C Contact Input:

The contact input is designed to work with a simple contact, button and RAC. For example, when connecting a button to GND-pin and 1-pin, it can trigger the setting function which is configured on the web browser interface.

D RS232 Connector:

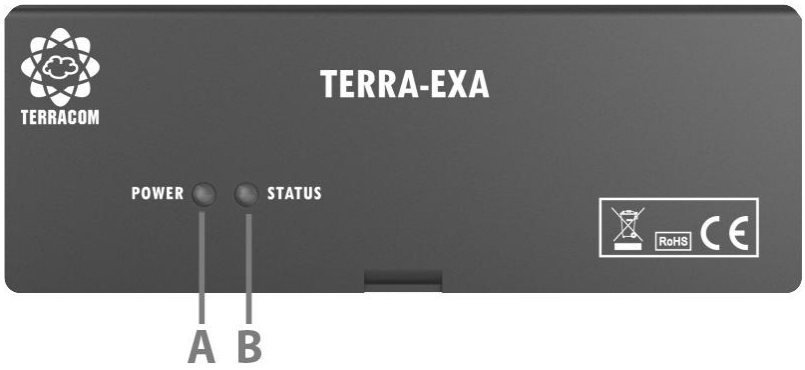
A RS232 for 3rd party control.

The RS485 connector is also available depends on the user's need for 3rd party control.

4.1.2 TERRA-EXA

TERRA-EXA is an IP audio decoder with a built-in 2 x 8W amplifier. It amplifies the IP terminal for 8ohm speakers. It also comes with 3 contact outputs and 1 contact input.

4.1.2.1 Front Panel



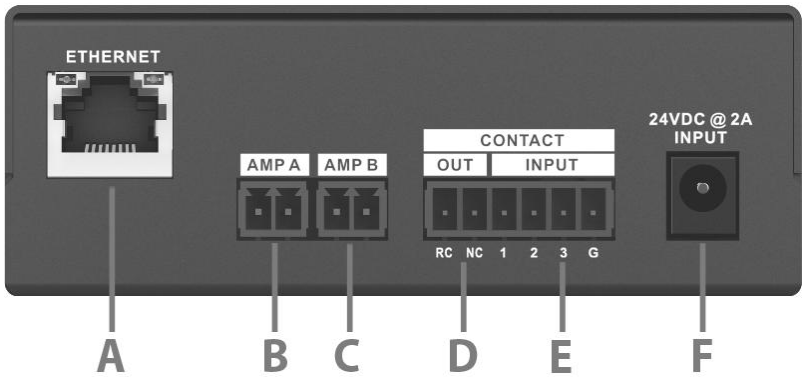
A Power LED:

The power LED lights up when the TERRA-EXA is powered on.

B Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

4.1.2.2 Rear Panel



A Ethernet Connector:

Ethernet connector (RJ45) for PC configuration and monitoring.

B C AMP Out A/B:

2 x 8W amplifier outputs for the IP terminal for 8ohm speakers.

D Contact Output:

The contact output which can be programmed and send a pulse or a static closing/opening to an external device. When the device is powered on and working properly, the NC (normally open) contact is closed and the NO (normally open) contact is open.

E Contact Input:

The contact input is designed to work with a simple contact, button and RAC. For example, when connecting a button to GND-pin and 1-pin, it can trigger the setting function which is configured on the web browser interface.

F 24VDC Input:

24VDC external power supply.

4.2 TERRA IP Encode/Decoder

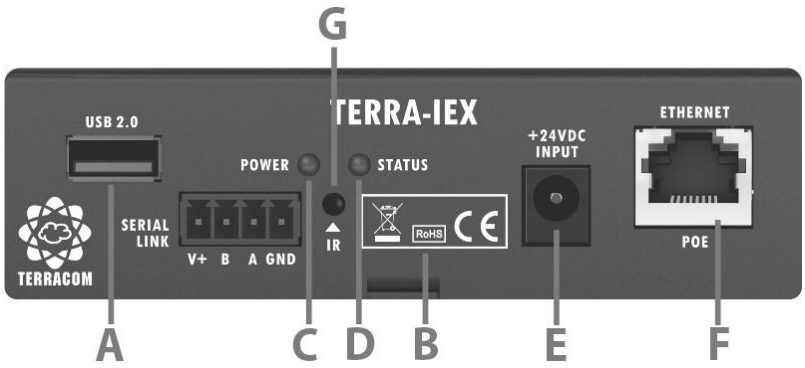
4.2.1 TERRA-IEX

The TERRA-IEX is a 2 channel audio over IP encoder/decoder which operates as an audio source for IP network such as a CD player or a sound card of a PC and be encoded in high quality MP3. A microphone can also be connected to the mic input and be encoded in G.722. An optional SPDIF input can also be used as a source. The TERRA-IEX streams its inputs in unicast or multicast. The same device also provides also 2 independent balanced outputs for full duplex communication or for local outputs.

By adding an USB memory stick, the playlists can be used as a backup of the decoded stream or as a source for the IP streaming. The volume and the channel can be modified by connecting to a low-cost source selector such as RAC.

The contact inputs offers various kinds of implement such as a push button to connect to the TERRA-IEX will broadcast the background music in pre-defined zones. Another button will send the mic input for general announcement. The priority management, volume management, event management & scheduler can be easily setup via web browser.

4.2.1.1 Front Panel



Ⓐ USB Type A Female Connector:

2.0 USB interface for music, message and recording.

Ⓑ Serial Link:

Either a RS232 or a RS485 for 3rd part control.

If using the RS232 port, the connector B is as the RX pin and A is as the TX pin.

Ⓒ Power LED:

The power LED lights up when the TERRA-IEX is powered on.

Ⓓ Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

Ⓔ 24VDC Input:

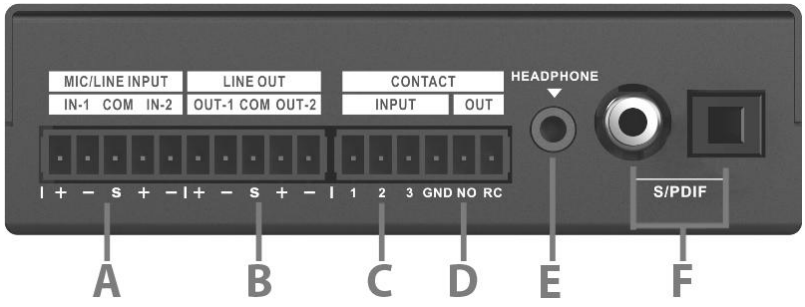
24VDC power supply input (if no PoE available).

Ⓕ Ethernet/PoE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

Ⓖ IR Receiver [Not in Use]

4.2.1.2 Rear Panel



Ⓐ Mic/Line Input:

2 Mic/line balanced inputs. S: Shield, +: Hot audio signal, -:Cold audio signal.

Ⓑ Line Out (Balanced Audio output):

2 balanced line outputs (1 stereo or 2 mono). S: Shield, +: Hot audio signal, -:Cold audio signal.

Ⓒ Contact Input:

The contact input is designed to work with a simple contact, button and RAC. For example, when connecting a button to GND-pin and 1-pin, it can trigger the setting function which is configured on the web browser interface.

Ⓓ Contact Output:

The contact output which can be programmed and send a pulse or a static closing/opening to an external device. When the device is powered on and working properly, the NO (normally open) contact is opened, and RC (relay common) contact is closed.

Ⓔ Headphone Connector:

A stereo line output (3.5 mm mini jack) for headphone.

Ⓕ+Ⓖ Optional S/PDIF Transceiver:

S/PDIF digital interconnect format.

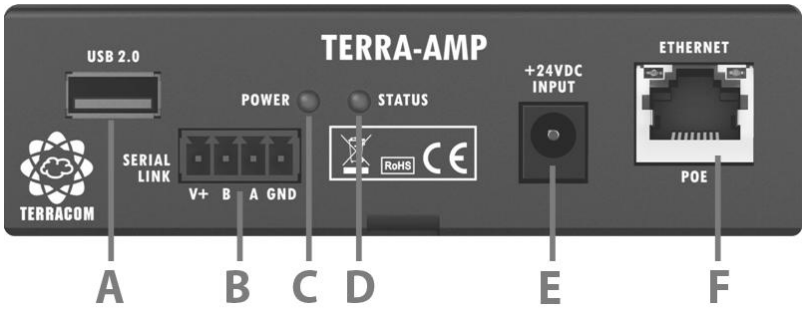
4.2.2 TERRA-AMP

TERRA-AMP IP audio terminal comes with a built-in 2 x 15W amplifier on two independent balanced outputs, USB 2.0 interface for playlist backups or prerecorded announcement, 1 mic/line balanced input, 3 contact inputs and 2 contact outputs.

In many applications, the TERRA-AMP amplified IP terminal for 8-ohm speakers will be a cost-effective solution for commercial audio & public address systems. The mic & line inputs can be played locally or can be used as a source for a network stream.

The TERRA-AMP uses G.711, G.722, G.726, G.727, G.729, MP3 audio codec, AAC+ decoder and in-box scheduler. Local sources and volume control can be implemented using the analog inputs. The priority management, volume management, event management & scheduler can be easily setup via any of your favorite web browser.

4.2.2.1 Front Panel



Ⓐ USB Type A Female Connector:

2.0 USB interface for music, message and recording.

Ⓑ Serial Link:

Either a RS232 or a RS485 for 3rd part control.

If using the RS232 port, the connector B is as the RX pin and A is as the TX pin.

Ⓒ Power LED:

The power LED lights up when the TERRA-AMP is powered on.

Ⓓ Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

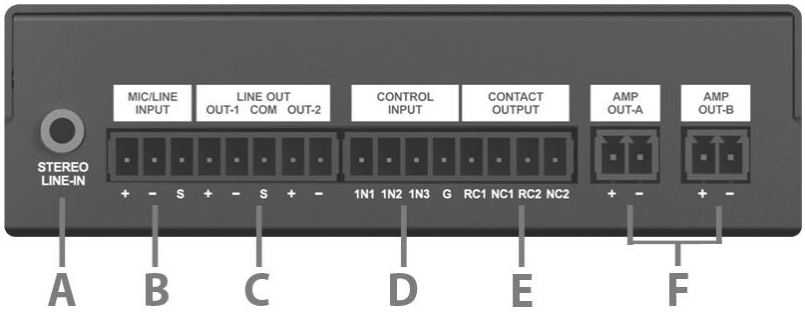
Ⓔ 24VDC Input:

24VDC power supply input (if no PoE available).

Ⓕ Ethernet/POE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

4.2.2.2 Rear Panel



Ⓐ Stereo Line-in:

A stereo line output (3.5 mm mini jack) for headphone.

Ⓑ Mic/Line Input:

A Mic/line balanced input. S: Shield, +: Hot audio signal, -:Cold audio signal.

C Line Output (Balanced Audio output):

2 balanced line outputs (1 stereo or 2 mono). S: Shield, +: Hot audio signal, -:Cold audio signal.

D Control Input:

The contact input is designed to work with a simple contact, button and RAC. For example, when connecting a button to GND-pin and 1-pin, it can trigger the setting function which is configured on the web browser interface.

E Contact Output:

The contact output which can be programmed and send a pulse or a static closing/opening to an external device. NC: normally close, RC: Relay common.

The NC (normally close) contact will be closed as soon as the device is powered on and working properly.

F AMP Out A/B:

2 x 15W (8 ohm) independent amplifier outputs. +: Hot audio signal, -:Cold audio signal.

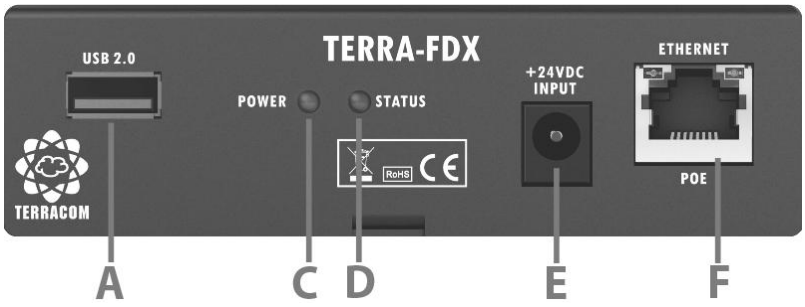
Note: 2 x 6W by PoE.

4.2.3 TERRA-FDX

The TERRA-FDX is design for paging and full duplex intercom system which offers the possibility to create bi-directional IP links for high audio quality and data transmission (G.711, G.722, G.726, G.727, G.729, MP3 audio codec and AAC+ decoder). Thanks to the standard SIP protocol, calls can be done by IP phones (AVAYA, CISCO, 3COM–).

The analog inputs, contacts and serial data are bi-directional and can be used in calling a device or a group of devices. The priority management, volume management, event management & scheduler can be easily setup via any of your favorite web browser.

4.2.3.1 Front Panel



Ⓐ USB Type A Female Connector:

2.0 USB interface for music, message and recording.

Ⓑ Power LED:

The power LED lights up when the TERRA-FDX is powered on.

Ⓒ Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

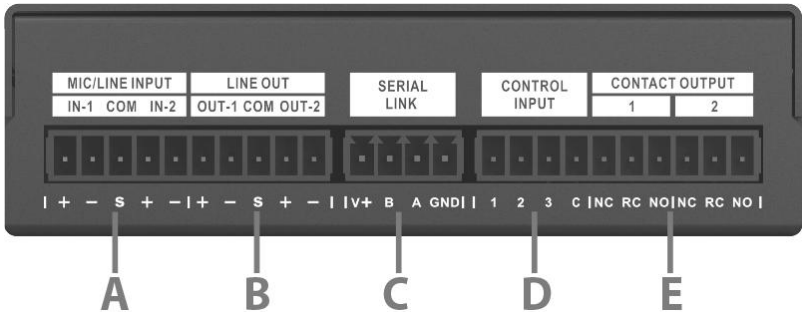
Ⓓ 24VDC Input:

24VDC power supply input (if no PoE available).

Ⓔ Ethernet/POE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

4.2.3.2 Rear Panel



Ⓐ Mic/Line Input:

2 Mic/line balanced inputs. S: Shield, +: Hot audio signal, -:Cold audio signal.

Ⓑ Line Out (Balanced Audio output):

2 balanced line outputs (1 stereo or 2 mono). S: Shield, +: Hot audio signal, -:Cold audio signal.

Ⓒ Serial Link:

Either a RS232 or a RS485 for 3rd part control.

If using the RS232 port, the connector B is as the RX pin and A is as the TX pin.

Ⓓ Control Input:

The contact input is designed to work with a simple contact, button and RAC. For example, when connecting a button to GND-pin and 1-pin, it can trigger the setting function which is configured on the web browser interface.

Ⓔ Contact Output:

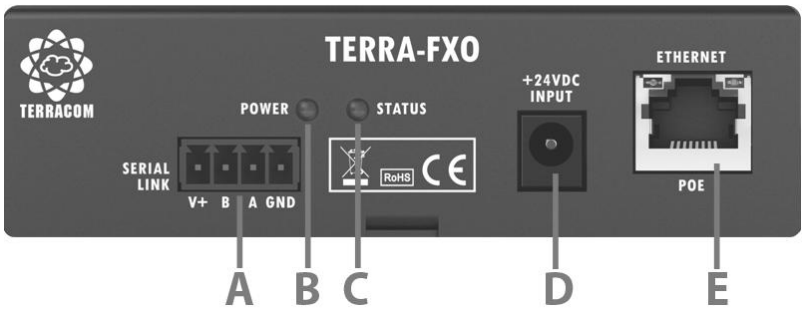
The contact output which can be programmed and send a pulse or a static closing/opening to an external device. NO: normally open, NC: normally close, RC: Relay common.

When the device is powered on and working properly, the NC contact is closed and the NO contact is open.

4.3 TERRA-FXO

In an IP intercom system, you may need to call a phone or a cell phone, the TERRA-FXO offers full duplex communication for IP intercom and telephone, it comes with 2 sets of telephone interfaces and DTMF management for receiving calls or broadcasting.

4.3.1 Front Panel



Ⓐ Serial Link:

Either a RS232 or a RS485 for 3rd part control.

If using the RS232 port, the connector B is as the RX pin and A is as the TX pin.

Ⓑ Power LED:

The power LED lights up when the TERRA-FXO is powered on.

C Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

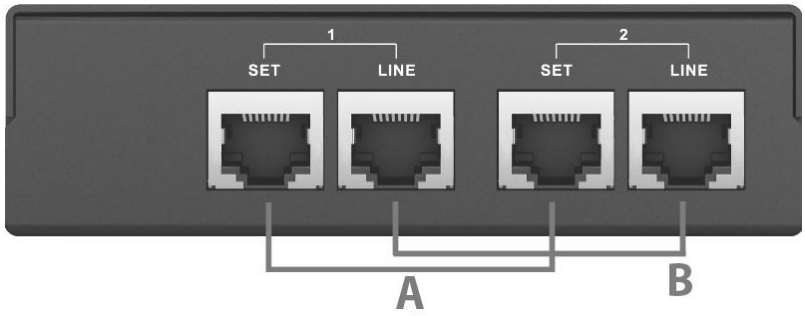
D 24VDC Input:

24VDC power supply input (if no PoE available).

E Ethernet/POE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

4.3.2 Rear Panel



A Handset:

2 SET connectors to connect to handset.

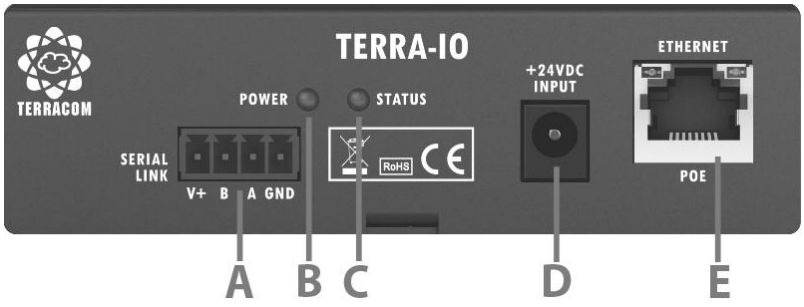
B Telephone Line-In:

2 LINE-In connectors to connect to telephone line.

4.4 TERRA-IO

The TERRA-IO is a Terracom device with contact outputs and inputs that are used in industrial & home automation applications or monitoring contact closures. The TERRA-IO are available for two types of models: Contact In x 8 and Contact Out x 8, Contact In x 4 and Contact Out x 4, plus the serial link (RS485 or RS232). The serial link can be used as a sensor for tele-monitoring in IP tunneling between a PC and a device. The contacts I/Os will be useful in industrial & home automation applications or contact closures monitoring. Thanks to the SNMP, the management is adapted to big systems.

4.4.1 Front Panel



Ⓐ Serial Link:

Either a RS232 or a RS485 for 3rd part control.

If using the RS232 port, the connector B is as the RX pin and A is as the TX pin.

Ⓑ Power LED:

The power LED lights up when the TERRA-IO is powered on.

Ⓒ Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

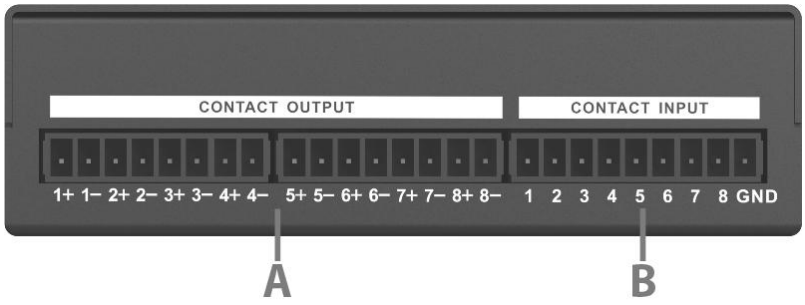
Ⓓ 24VDC Input:

24VDC power supply input (if no PoE available).

Ⓔ Ethernet/POE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

4.4.2 Rear Panel



Ⓐ Contact Output Channel 1~8:

The contact output which can be programmed and send a pulse or a static closing/opening to an external device. +: normally open, -: Relay common.

When the device is powered on and working properly, the contact (+) is opened.

Ⓑ Contact Input:

The contact input is designed to work with a simple contact, button and RAC. For example, when

connecting a button to GND-pin and 1-pin, it can trigger the setting function which is configured on the web browser interface.

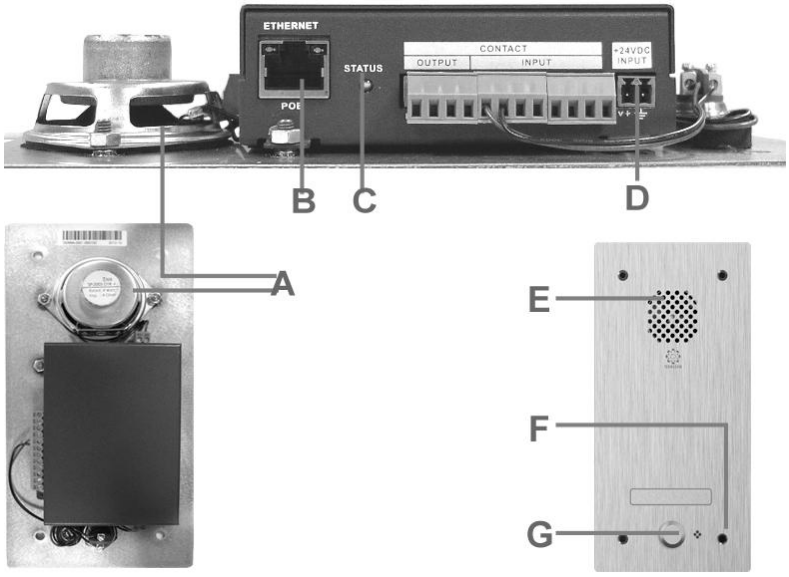
4.5 TERRA-DS

The TERRA-DS wall-mount SIP/IP intercom station is an indispensable device for intercom solution, featuring high quality hands-free SIP/IP communication. Also, the contact inputs/outputs on TERRA-DS allows for electronic door/gates lock down. Thanks to an optional casing, it comes with IP54 vandal, water-proof and dust-proof standards.

There are 4 versions of TERRA-DS:

- TERRA-DS1 = one-key button.
- TERRA-DS2 = two-key buttons.
- TERRA-DS3 = three-key buttons.
- TERRA-DS4 = four-key buttons.

4.5.1 Front/Rear Panel



A & E 2W Loudspeaker

B Ethernet/PoE Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

C Status LED:

The status LED will flash four times while the device is powered on. If there's a fault, the status LED will light up.

D 24VDC input:

24VDC power supply input (if no PoE available).

F Built-in Condenser Microphone

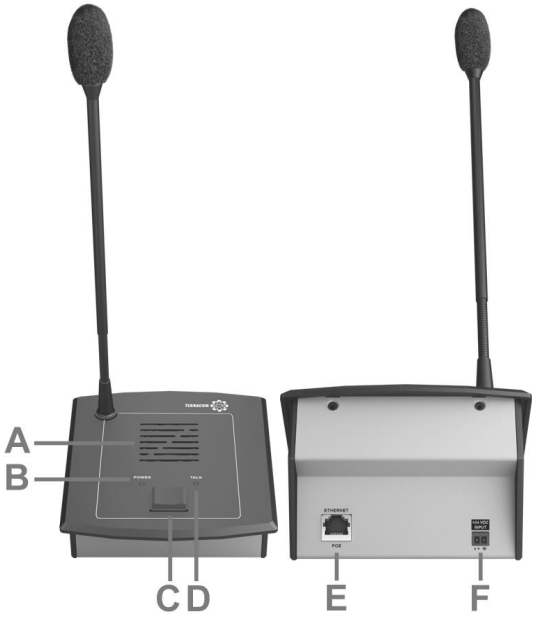
G Call Button:

A call button which performs the intercom call and can be set via web browser interface.

4.6 TERRA-K

The TERRA-K is a multi-function IP based microphone which is designed for full-duplex intercom and paging (Unicast/Multicast/Broadcast) over LAN/WAN. The TERRA-K can be used with the TerraManager to perform the recording function.Its pre-chime and post-chime can be congured via web browser interface.

4.6.1 Control Panel



Ⓐ Loudspeaker:

This built-in speaker to play chime and audio message when paging or monitoring signals from TerraManager and on web browser.

Ⓑ Power LED:

The power LED lights up when the TERRA-K is powered on.

Ⓒ Paging Button:

The "Push to Talk" button for paging.

Ⓓ Talk LED:

This LED lights up when the TERRA-K is in "talk mode".

Ⓔ Ethernet/PoE (RJ45) Connector:

Ethernet connector (RJ45) for PC configuration, monitoring and power supply.

F 24VDC Input

4.7 PPM-IT5

The PPM-IT5 console comes with a 5" TFT touch screen interface which allows intercom with all TERRACOM devices, call-paging, messages broadcasting and DSP matrix parameter control. Its back-lit touch screen is designed for simple and user-friendly operation. Thanks to powerful echo cancellation, the PPM-IT5 delivers clear sound for full duplex communication. The 3 hardware keys can be freely assigned within the system control software.

All the paging parameters needed for site operation can be programmed such as assign zones to different buttons, name of zones, group of zones, messages triggering or event control. A total of 168 keys over 14 pages for zone or group of zones selections. The pre-recorded messages and chime are stored into the PPM-IT5 IP paging console. All the settings can be configured via web browser interface.

4.7.1 Control Panel

A Microphone:

A 280mm flex microphone.

B Power LED:

This LED lights up when the PPM-IT5 is powered on.

C Fault LED:

To display fault status of system, this LED will light up permanently if a fault state in the VACIE system has been engaged.

D EVAC LED:

This LED lights up when system is under evacuation paging, this LED will light up permanently if a evacuation state in the VACIE system has been engaged.

Status	Frequency	Activity
Permanent		System is under evacuation paging.

E F G Button:

Push the button during the half-duplex conversation to activate the following commands below, this can be programmed via web interface.

- Audio Source Select
- Audio Level -
- Audio Level +
- Push To Talk (Intercom)
- Push To Talk (Paging)
- Push To Talk (Evac Announce)
- Push To Talk (Vote Announce)

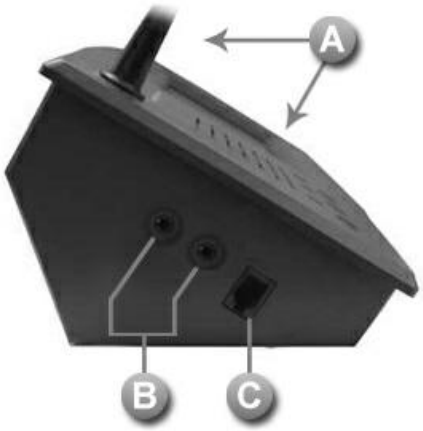
H Loudspeaker:

A monitoring loudspeaker to play chime when paging or monitor the signal from audio processor.

I Touch Screen:

A back-lit touch screen with 5" diagonal and 800 x 480 resolution, each buttons in the PPM-IT5 can be freely configured as a zone paging button or parameter adjustment in audio processor such as IDA8.

4.7.2 Side Panel



A Microphone and Loudspeaker:

Use the internal speaker and microphone of PPM-IT5.

B Phone Jack:

3.5mm headphone jack: To connect to a external headphone output.

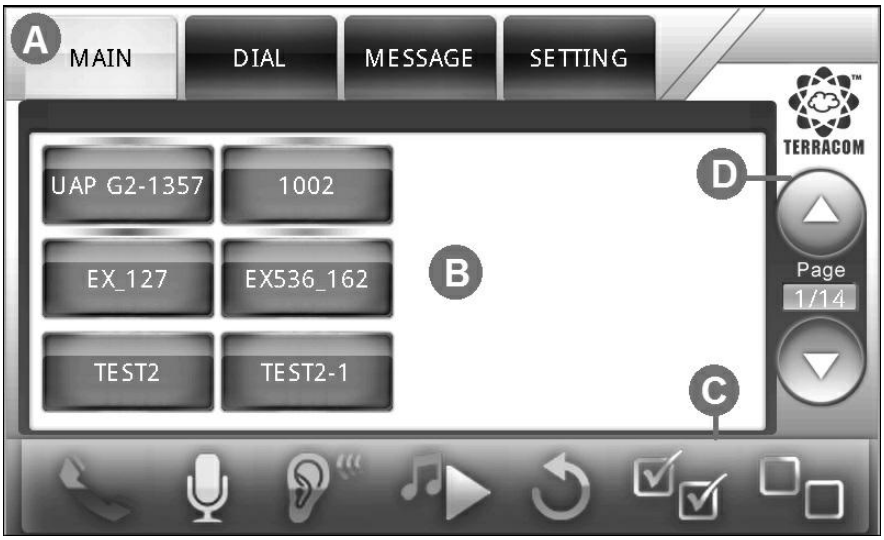
3.5mm mic port (close to RJ9 connector): To connect to an external microphone input.

C RJ9 Connector:

To connect to a RJ9 telephone handset.

4.7.3 LCD Menu

All the buttons displayed on the PPM-IT5 will be managed via Terracom web interface, the touch panel is for operation only. The PPM-IT5 supports multi-language, you can change the language shown on each button (default: English).



A Primary Horizontal Menu:

- MAIN: Display the device buttons, event buttons and function buttons.
- DIAL: For typing the telephone numbers such as SIP URI and so on.
- MESSAGE: Display the message list.
- SETTING: Display the setting information.

B Content area.

C Operation:

 SIP Call

 Paging

 Monitoring

 Play message

 Back to root menu (works with Macro buttons)

 Select all

 Deselect All

Page Up/Page Down.

4.7.3.1 Main

❖ Button Types:

When press the button displayed PPM-IT5, its color will be changed to a lighter color.

- Device Button (Blue): Display the device name on the button. There is an color indicator at the upper-middle corner of a button to display its status, see the picture below.

  - Green: Available
  - Red: Off-line
  - Gray: Busy

In case of changing a device button names, you can use Ateis Studio software to change the name of LAP, ECS and IDA8 and edit the names of Terracom device's on web interface.

- Command Button (Orange): Press to perform the Command (string) function which has defined on the web interface.

- Logic Out Button (Orange): Press to perform the Logic (Out) function which has defined on the web interface.

- Locked Button (Orange): Locked button to similar to Command button, but it holds the Up/Down status.

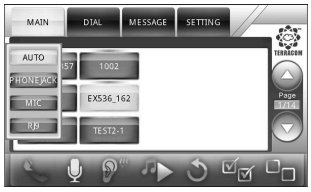
- Macro Button (Green): Manage the buttons like a folder. After create a Macro button, press to enter in its page. See how to create a Marco button from Macro button 60 chapter.

❖ Switch between the Audio Input/Output Set:

Press the hardware button on the front panel, a pop-up window will be displayed for switching the audio source.

Please note the action of the three hardware buttons on CDM-T5 needs to be programmed via web interface >Steup 1 > Machine Windows > Parameter Setting > External buttons 74 first.

- Auto: Automatically detect the audio input/output set.
- Phone Jack: For plugging the external speaker and mic, the 1/8 inch (3.5mm) jack close to the RJ9 connector is the input.
- Mic: Use the internal speaker and microphone of PPM-IT5.
- RJ9 Connector: For plugging a RJ9 telephone handset.



❖ SIP Call:

- Call to other devices (one to one):
  1. Select a zone button which user wishes to call.
  2. Then press  SIP Call button.

- The call from other devices (one to one):
  1. When receiving the SIP call from external device, a confirmation window will display and ask whether to [Accept] or [Reject] the call.

  2. Click [Hang up] button to end this SIP call.

- Paging to multi-users (multi-zones):
  1. Select multiple zone buttons which user wishes to paging to.
  2. Then press  Paging call button.

❖ Paging Message to Multiple Devices:

1. Select multiple zone buttons (devices).
2. Select the message file.
3. Press  Play Message button.

4.7.3.2 Dial

- BS: Backspace.
- CANC: Cancel all.
- CAPS: Caps lock.
-  SIP Call:

Now the 100 in the Device List and call "100@1 user doesn't have to spend much time on typing the entire URI on the touch panel. After enter the name, and easily press the green  button and the complete address will be dialed automatically if the name is existed.

For example, if you enter "100" and press the button, The PPM-IT5 will find the exact device named92.168.100.1:5060".

-  Telephone Call:

If you're going to dial a local phone or a cellphone, type the number and press  button.

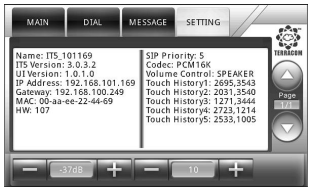
You can re-dial the last number by pressing  button.

4.7.3.3 Message

❖ Play Audio Messages:

1. Select the audio file on Message page.
2. Select the devices, and press  button.
3. The audio files are stored in the device's flash. You can check the free disk space on the web interface. Note: The format currently supported is WAV (16k 16bit only).

4.7.3.4 Setting



-  (Volume):

  Use - button and + button to adjust the speaker volume.

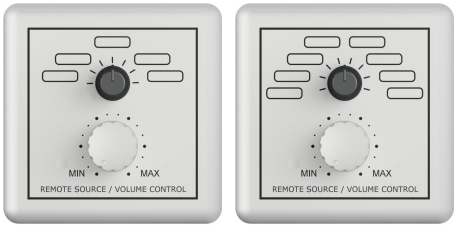
-  (Brightness):

  Use - button and + button to adjust the screen brightness.

4.8 Consoles and Accessories

4.8.1 RAC5/RAC8

The RAC can be used to adjust the source settings such as level control, parameters remotely. The two sets of 5/8 steps knobs on RAC can be programmed by using ATEÏS Studio software. The RAC5/8 is available for US and EU type, and is powered by 24VDC.



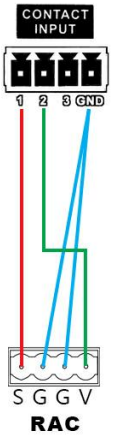
RAC5/RAC8
(EU Type)

RAC5/RAC8
(US Type)

- RAC5: Wall-mount level and 5 sources selectors
- RAC8: Wall-mount level and 8 sources selectors

4.8.1.1 Wire Connection with Terracom Device

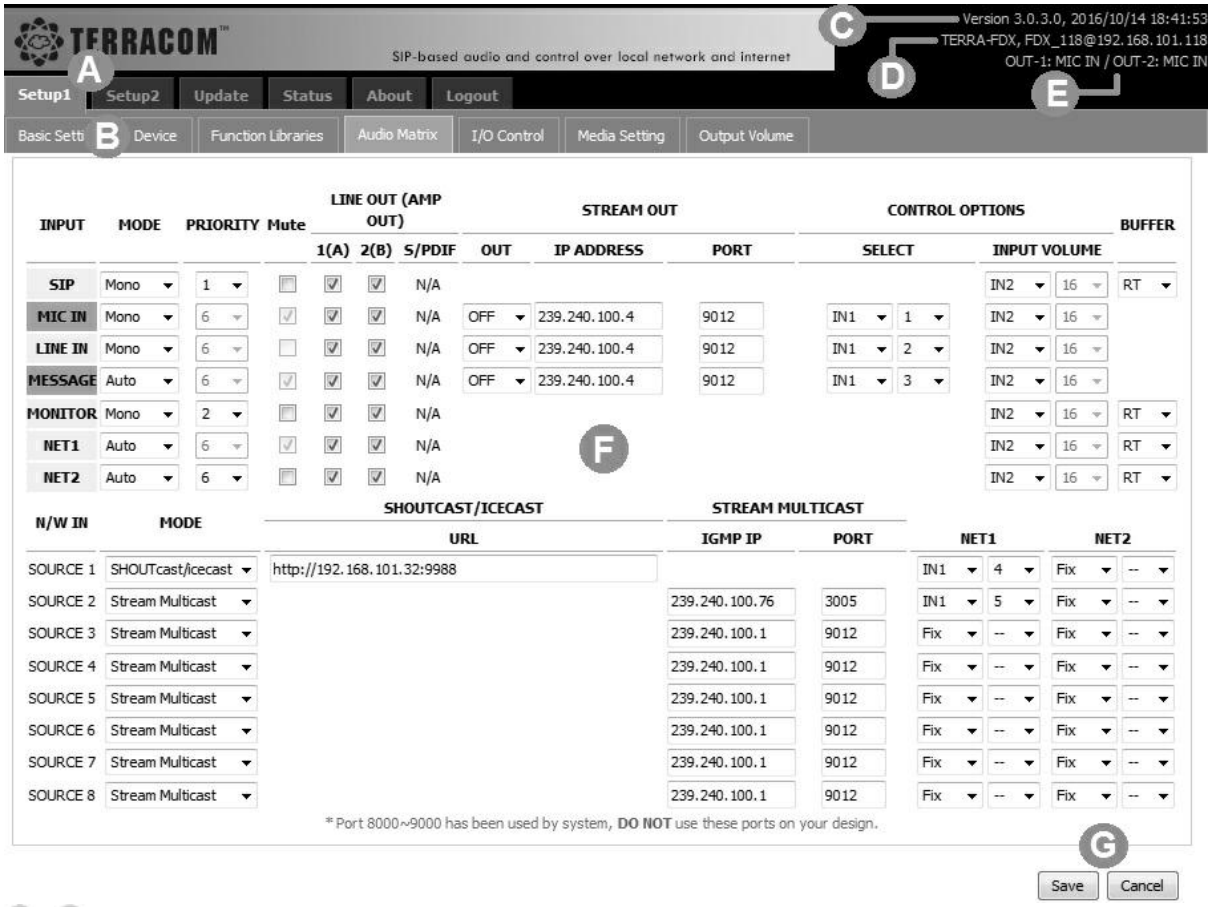
The RAC is using in analogue connection. It can be influenced by nearby power cables or 100V speaker lines. To avoid this use shielded cable to connect the device.The type of cable mostly used for this is the CAT5 cable.



5 Web Interface

The Terracom devices can be programmed and controlled by Internet browser interface.

5.1 Windows Layout



A B Primary Menu & Secondary Menu

C D System Status:

C Display the current firmware version and the information of system time

D Display the current device and URI (sip:x@y:Port) that user is using

E Line Out (Display the information of Line Out (2 channels))

F Content area

G Save/Cancel/Done buttons

5.2 IP Address

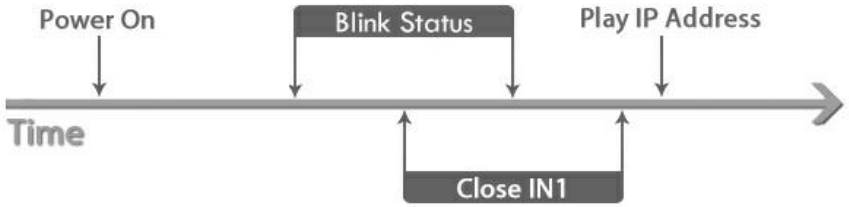
If you lose the IP address of your Terracom devices and cannot connect to the web browser interface, please read the following instruction.

- With only one device:
    1. Speak Out IP Address:

Most of the Terracom devices (TERRA-EX, EXA, IEX, AMP, FDX, DS.) have a "Speak Out IP Address" function on web browser interface. The default is checked.

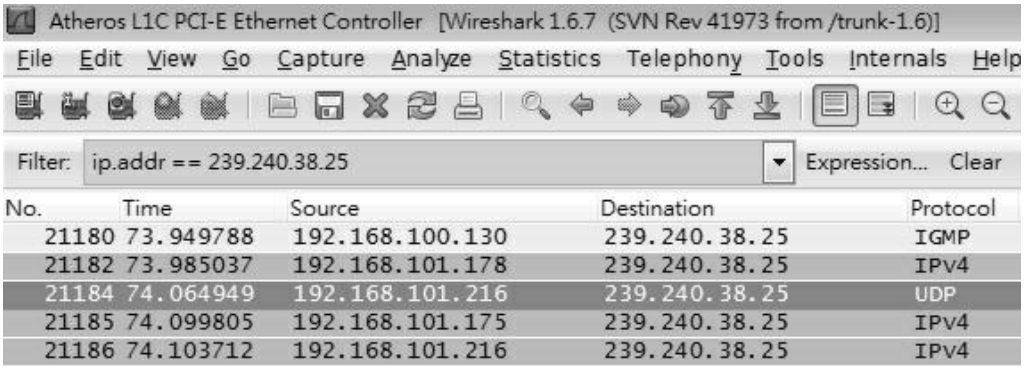
When the Status LED on the devices flashes four times while it is powered on:

- Short-circuit (close) the contact input 1-pin and G-pin will read the IP address through the speakers.
- Short-circuit the contact input 2-pin and G-pin will reset to the default factory setting.



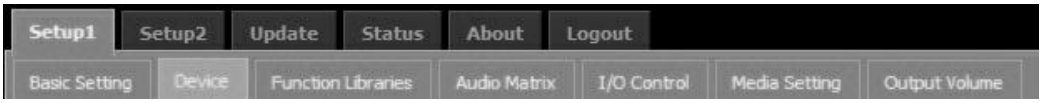
2. Using Packet Analyzer software:

Download the free Packet Analyzer software such as Wireshark and set the filter as "ip.addr == 239.240.38.25", a list of all Terracom units connecting to your LAN will be displayed.

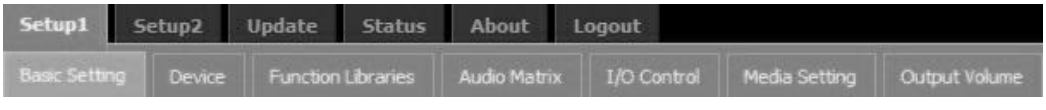


- Already have two or more devices on the web browser:

Open the Terracom web browser, click "Setup1 > Device" and find out the Terracom unit you want.



5.3 Setup 1



Under the "Setup 1" and "Setup 2" tabs, you can set how Terracom device connects to the network and performs functions such as Stream Out, Logic Control, 3rd party control, etc.

The name of the tabs and their content is depending on the type of the Terracom device.

5.3.1 Basic Setting

5.3.1.1 Network/Serial/System Time/Family Status/Serial Link/Third Party Controls/Codec Setting

❖ Network

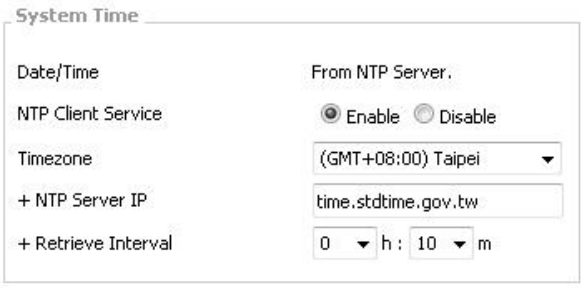
- DHCP: Enable/disable the DHCP (Dynamic Host Configuration Protocol).
- IP Address: Click to change its IP to fit your network (The default IP address of Terracom device is 192.168.102.10).
- Subnet Mask: Depend on the LAN where the Terracom devices located.
- Gateway Server: The IP address of the gateway server.
- DNS: Tick the checkbox to enable the DNS server and IP address.

❖ Serial (for 3rd Party Control)

- Speed (baud), Date bits, Stop bits, Parity: The settings for 3rd Party Control and SERIAL LINK bypass.

❖ System Time

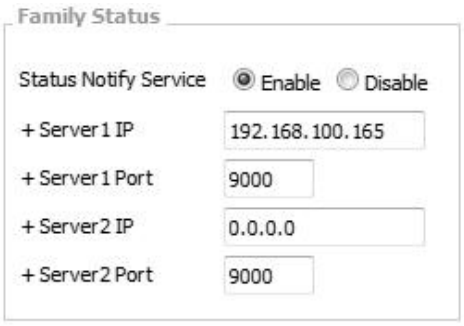
- Date/Time: The device time will be either as manual user-defined or from NTP server.
- NTP Client Service: Once enable this, the NTP Server IP address is needed.
- Timezone: The timezone of your Terracom devices.
  - + NTP Server IP: Set the IP address of NTP Server.
  - + Retrieve Internal: Set the internal to update the system time.



Changes in the System Time area will affect the Scheduler and the Current Time display on the web page.

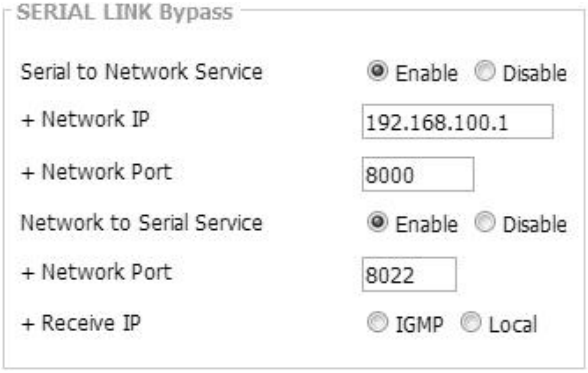
❖ Family Status

- Status Notify Service: Enable the Status Notify Service for allowing other Terracom devices which are not in the same local network to proceed the intercom or paging with others via IPS (Internet Paging Server). See IPS 105 chapter for more information about IPS.



❖ SERIAL LINK Bypass

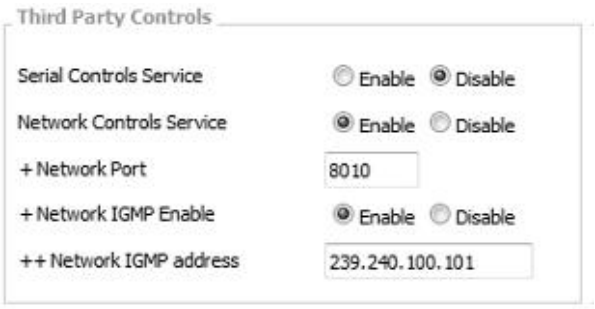
- Serial to Network Service: Enable/disable the bypass of 3rd party device from the serial link of Terracom device (RS232/RS485) to the Ethernet network.
- Network to Serial Service: Enable/disable the bypass of 3rd party device from Ethernet network to the serial link of Terracom device (RS232/RS485).



❖ Third Party Controls

There are two interfaces provided for 3rd Party Control:

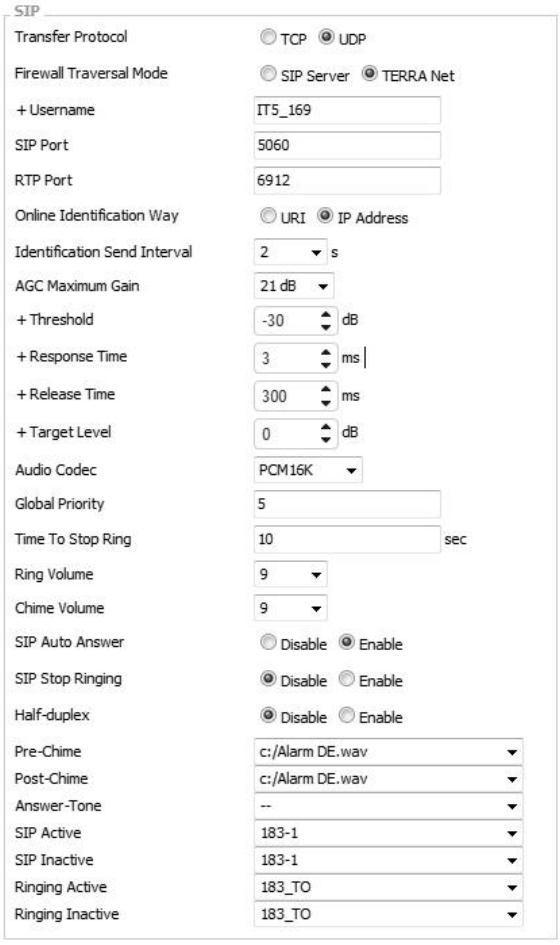
- Serial Controls Service: Enable/disable the 3rd party control. Once enabled, the "Serial" setting area is required.
- Network Controls Service: If the Network Controls Service is enabled, the local network port is required.
- Network IGMP Enable: Enable/disable to use IGMP address, the default network port is 8010.
- Network IGMP Address: Set the IGMP address.



❖ Codec Setting

- MP3 Encoder Bit rate: Select 128k or 192k encoder bit rate of MP3 when streaming or recording.

5.3.1.2 SIP



- Transfer Protocol: Select either TCP or UDP for the communication protocol between the Terracom devices and SIP Server. Note: The transfer protocol of the Terracom devices and SIP Server should be the same.
- Firewall Traversal Mode: Use [TERRA Net] to relay the audio packet through TCP/UDP or use [SIP Server]. For more information, please see System Network 10 chapter.
- Username (TERRA Net only): The SIP calling name can be user-defined in the text or telephone number.
- SIP Port: The network port for SIP protocol, set 5060 by default.
- RTP Port: The network port for RTP protocol for receiving and transmitting audio, set 6912 by default.
- Online Identification Way: The Terracom supports to paging to Terra device via Internet Paging Server (IPS). Here you can choose the URI or IP Address option as the identification way to know whether the Terra device is online/offline.
- Identification Send Interval: The time interval of sending IPS signal.


Please note if user set the time interval higher, it can decrease bandwidth occupy on network, but will cause the response time for IPS to detect Terracom device become slower.

- AGC Maximum Gain: The maximum gain of AGC supported by the mic audio during the intercom and paging.
  - Threshold (dB): Set the threshold level and the audio level is above, then the gain will be controlled.

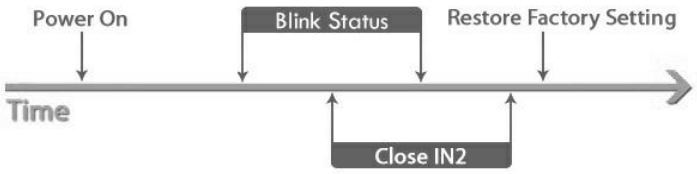
    ⚠ Don't set the level too low, otherwise it will hear unexpected sounds such as ambient noise.
  - Response Time (ms): Set a pre-delay time for automatic attenuation.
  - Release Time (ms): Adjust the fade-out time of the signal when AGC is no longer working.

    ⚠ If the release time is too short, the audio slack will be heard during the intercom and paging.
  - Target Level (dB): Define which relative volume you want to target.
- Audio Codec: There audio codec for SIP, G.711, G.722, G.726, G.727, G.729, MP3, PCM16K and AAC+ decoder.
- Global Priority: The paging priority with IDA8, UAP G2, LAP G2T and ECS processors. For example, when multiple Terracom devices or TerraManager is paging to IDA8, the Global Priority will be used to define which Terracom devices can use the VoIP component in IDA8.


Once the SIP priority here is higher than the TerraManager's, this device's zone won't be able to paged by TerraManager.

- Time to Stop Ring: The SIP call will be hung up after the set time. If sets up as 0 second, it won't stop ringing.
- Ring Volume: The volume of ring tone.
- Chime Volume: The volume of pre-chime/post-chime.
- SIP Auto Answer: The SIP call will be automatically picked up, usually for monitoring usage.
- SIP Auto Answer Input: Choose the input source, MIC IN or LINE IN.
- Speak Out IP Address (CIN1): Open the control channel input 2 and power on the device, during the LED flashing, then close the input 2 and Ground. The TERRA-EX, EXA, IEX, AMP, FDX, DS will speak out its IP Address.
- Factory Setting (CIN2): Open the control input 2 and power on the device, during the LED flashing, then close the control input 2 and Ground. The devices will reset to the default setting (factory setting).


The Factory Setting allows to go back to the default IP address (192.168.102.10) in case you forget the IP address of your Terracom device.



Factory Setting (CIN2)

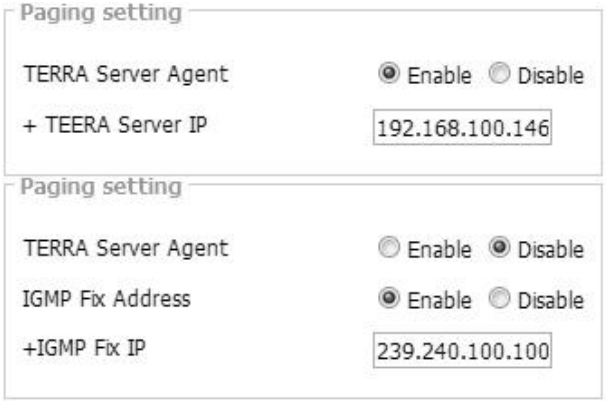
- Pre-Chime/Post-Chime: The chime setting for paging.
- SIP Active/Inactive: To trigger an action before the SIP call and after the SIP call. The triggered action can be the Logic Out, Command (string) and Multi Function.

5.3.1.3 Paging Setting/Audio Setting

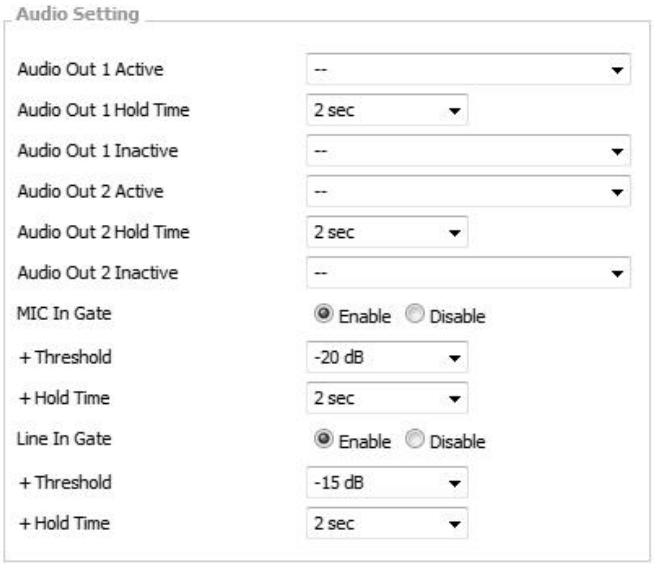
❖ Paging Setting

You can only enable one setting at a time.

- TERRA Server Agent: Paging through Internet Paging Server, please note the "Family Status >Status Notify Service" needs to be enabled.
  - TEERA Server IP: Enter the IP address of your TerraServer.
- IGMP Fix Address: Enable to allow the fix IP address to use the specific IGMP address, otherwise, the system will use the random IGMP address during paging.
  - +IGMP Fix IP: Set the fix IGMP address.



❖ Audio Setting



- Audio Out 1 & 2 Active: Trigger the action when output the Audio Out 1 & 2. The action can be the Command (String), Logic Out and Multi Function.

- Audio Out 1 & 2 Hold Time: The hold time to trigger the Inactive action from the timing of the audio starts to output to the audio stops to output.
- Audio Out 1 & 2 Inactive: Trigger the action when Audio Out 1 & 2 haven't been output. The action can be the Command (String), Logic Out and Multi Function.
- MIC in Gate/Line In Gate: Enable/disable the Gate function for MIC In/Line In audio source.
  - + Threshold: The threshold for triggering the Mic In Gate/Line In Gate.
  - + Hold Time: The period of time that the level of Mic In/Line is continuously less than Threshold, if this period of time greater than Hold Time, the Mic/Line In will stop to input.

When enables the [Mic In Gate] and [Line In Gate] setting on [Audio Setting], their [Threshold] and [Hold Time] setting will be displayed.

5.3.2 Device (List)

❖ List the Terracom devices located in the same LAN or the devices that users add in manually. The different color on status of device will be indicated as below.

- Black: The devices that users manually add in.
- Grey: The devices are located in the same LAN, but they haven't been added into the Device List.

- Zone: The paging zone of the device.

The max. number of supported zones is 1024.

- Tele Number: The number will be displayed when the TERRA-FXO is connected.
- Status: The green button will indicate the device is in online status, and grey button indicates the device is in offline status.
- Action: Users can perform [New], [Edit] or [Delete] action on the device.
  - New: Add the device in the same LAN.
  - Edit/Delete: Edit/delete the device.
- New Device: Create a new device in a device list which the zone settings require to be different from other device. For example, the zone setting of TERRA-FDX on first device is Zone 1, and on the second device is Zone 2.

5.3.3 Function Libraries

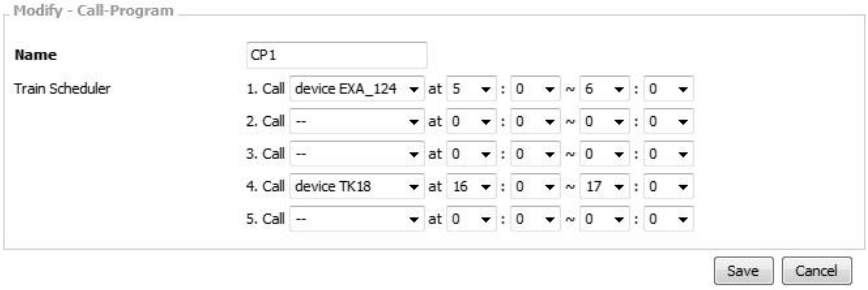
The [Function Libraries] allows to set the functions and action for managing/controlling the Terracom devices. Follow the steps to create an action.

1. The source path on the web is Terracom web interface > Setup 1 > Function Libraries.
2. Select the function from drop-down box, and click [Add] button.

The 3 items in this chapter: Locked Button 61, Goto Button 61, External Variable 62 and Macro 60 are only supported by PPM-IT5, and Call Program 48 is for TERRA-DS.

5.3.3.1 Call Program (TERRA-DS)

Set the call schedule and the TERRA-DS will call different devices with the assigned time.



- Name: The display name of this [Call Program] list.
- Train Scheduler & Time: Select the devices and set the time which the TERRA-DS wishes to call. The [Call-Program] function supports 5 different set, if there is a conflict between the train scheduler, the call schedule with earlier time will be used (called). The device can be any Terracom devices or device on the group list.
- Time (hour:minute~hour:minute): Set the assigned time to call the device.

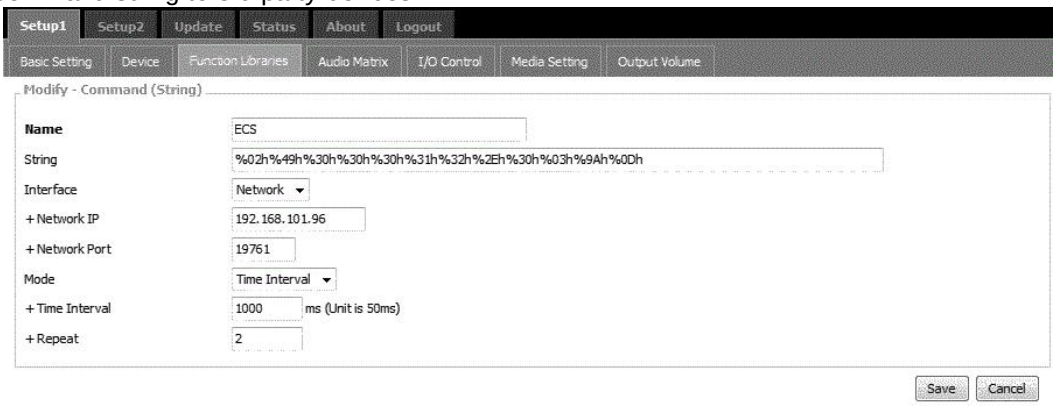
5.3.3.2 Device Group

Create a device group with multiple Terracom devices.

- Name: The display name of this [Device Group] function.
- Intercom Mode:
  - Call Next: When the first device does not answer the call, the call will transfer to the next device, and continue to call the devices in the device group until one of the device has picked up the call.
  - Broadcast All: Call all the devices in the [Device Group] until any device in this group has picked up the call.
- Device: Select the Terracom device which user wishes to add it in the [Device Group], click [>] and [>>] button to add one or all the devices or click [<] or [<<] button to remove one or all the devices from the left side to the right side.

5.3.3.3 Command (String)

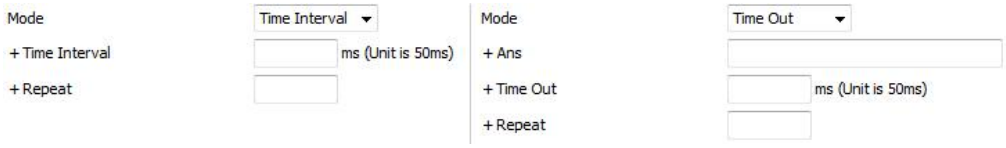
Send command string to 3rd party devices.



- String: The code of the string will depend on the 3rd party devices. The picture above is an example of sending the command string in ASCII code to Ateis processors (IDA8, UAP G2, ECS, LAP G2T), the Ateis processors use Hex code, then users need to change the string in Hex code to ASCII code. The Hex code is %XXh, the XX indicates the character of Hex code.

Please note the Terracom only receive the command string in ASCII code.

- Interface: You can send the command string through the serial port (RS485/RS232) or network.
- Mode:

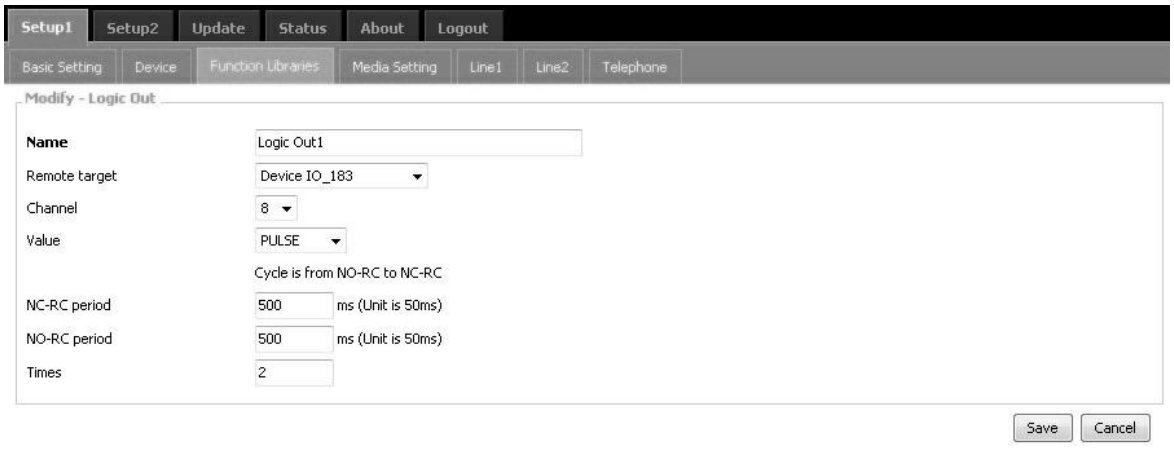


  - Time Interval: The period of sending the command string to 3rd party device.
  - Time Out: The device will stop sending the command string after receiving the answer string from the 3rd party device.
  - +Ans: The answer string which sends to Terracom device when 3rd party device has received the command string.
  - +Time Out: Set the "period time" to resend the command string when not receiving the [+Ans] response.
  - +Repeat: Set the "repeat time" to resend the command string when not receiving the [+Ans] response.

❖ Users can send the command using logic/Scheduler to 3rd party devices such as UAP G2, ECS, LAP G2T etc.

5.3.3.4 Logic Out

Use logic output to control the 3rd party devices.



- Name: The display name of this [Logic Out] action.
- Remote Target: Select the device you wish to perform this [Logic Out] action.
- Channel: The channel is depending on the number of logic output channel of your Terracom device has. For example, the TERRA-IO has 8 relay outputs (channels).

The [Logic Out] action will not be activated if no channel is selected on [Channel] option.

- Value:
  - NO-RC: Trigger the channel relay of contact output which is "NO RC" in rear panel (Normally Open).
  - NC-RC: Trigger the channel relay of contact output which is "NC RC" in rear panel (Normally Close).
  - TOGGLE: Trigger the relay switch of contact output between Normally Open and Normally Close. The default switch can be user-defined on I/O Control > Local Control > Output Default.
  - PULSE: Close during High period then open during Low period like a square wave.
    - NC-RC Period: The time which the contact output channel triggers the relay "Normally Close".
    - NO-RC period: The time which the contact output channel triggers the relay "Normally Open".
    - Times: Set how many times which the reply of contact output channel will be triggered.
  - REVERSE: Reverse to the last value status after triggering.

How-to: Please refer to Use Logic Out to Activate Amplifier During Paging 94 chapter.

5.3.3.5 3rd Party Controls

Allows other device to control the Terracom devices through 3rd Party Control.

Please enable the [Network Controls Service settings] and set the [+Network Port] on Steup1 > Basic Setting > Third Party Controls 42 first.

- Name: To trigger an action via 3rd party control, the action name sent from 3rd party device must be the same as the [Name] here.
- Function: Please refer to the 3rd party control chapter as below.

Interface		Function
Connection	Settings	
Ethernet(UDP)	UDP Port = 8010	• Call 52 • Message 53 • Monitor 54 • Hang Up 53 • Command (String) 54 • Logic Out 55 • Monitor Cancel 54 • Level Control/Read 55

Interface		Function
Connection	Settings	
RS232	Speed (baud) Data bits Stop bits Parity	• ON/OFF Switch Control/Read 57 • Device Status 57 • Multi Function 57 • Netstream Select 57 • Music Play/ Music Stop 58 • Logic Read 59 • Line Status (TERRA-FXO) 58 • Line Hangup (TERRA-FXO) 58

- Target: Choose the Terracom device (target) which allows 3rd party device to paging/SIP/trigger logic/monitor/control.
- Enable Status: Set Enable/Disable to activate/deactivate the [3rd Party Controls] action.

5.3.3.5.1 Call

The 3rd party device sends a command to call a device or a device group.

- Source: Use the calling source (MIC IN or LINE IN).
- Mode: Choose the calling mode (Intercom, Paging, EVAC Announce and Vote Announce).
  - EVAC/Vote Announce: This two call modes are only applicable when using PPM-IT5 to paging to TERRA-RD. The paging priority: EVAC Announce > Vote Announce > Paging.
- Security: If the [Security] option is enable, the caller cannot hang up the call during paging unless the call receiver cancels the call itself.

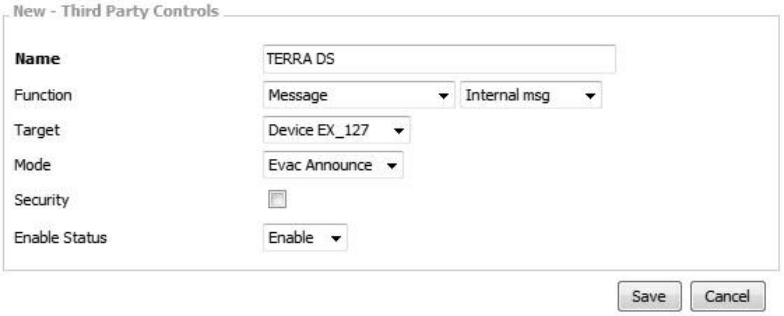
- Command-Call:

  From the example picture above, if you wish to trigger the Call action via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.2 Message

The 3rd party device sends a command to play multiple message/s to a device or a device group.



- Function: Select the message file/folder which you create on Media Setting > Internal/External List.
- Mode: Choose the calling mode (Intercom, Paging, EVAC Announce and Vote Announce).
  - EVAC/Vote Announce: This two call modes are only applicable when using PPM-IT5 to paging to TERRA-RD. The paging priority: EVAC Announce > Vote Announce > Paging.
- Security: If the [Security] option is enable, the caller cannot hang up the call during paging unless the call receiver cancels the call itself.

- Command-Message Play:

  From the example picture above, if you wish to trigger the Message Play action via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.3 Hang Up

The 3rd party device sends a command to hang up a call (intercom/paging/EVAC Announce/Vote Announce) or a message.

- Command-Hangup:

  From the example picture above, if you wish to trigger the Hangup action via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.4 Monitor

The 3rd party device sends a command to monitor the source.

- Source: Select which source you wish to monitor (SIP/MIC IN/LINE IN/MESSAGE/NET1/NET2/ LINE 1/LINE 2).

5.3.3.5.5 Monitor Cancel

The 3rd party device sends a command to cancel the monitoring of SIP/MIC IN/LINE IN/MESSAGE/ NET1/NET2/LINE 1/LINE 2 source.

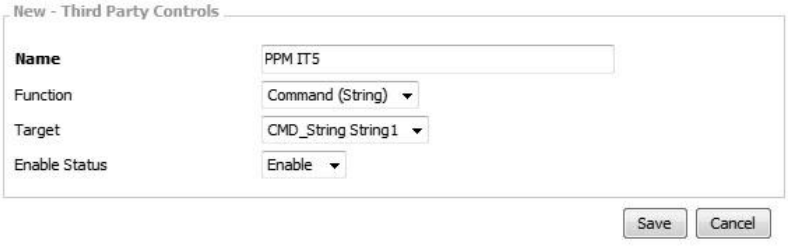
- Command-Monitor/Monitor Cancel:

  From the example picture above, if you wish to trigger the Monitor/Monitor Cancel action via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.6 Command (String)

The 3rd party device sends a command to control other devices



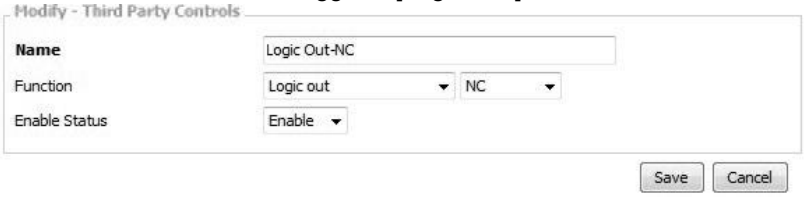
- Command-Command (String):

  From the example picture above, if you wish to trigger a Command (String) action via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

- 200 (ASCII Code) indicates OK (received).
- 400 (ASCII Code) indicates NG (not received).

5.3.3.5.7 Logic Out

The 3rd party device sends a command to trigger a [Logic Out] action.



- Command-Logic Out:

  From the example picture above, if you wish to trigger a Logic Out action action via 3rd party device, please send a command data as Logic Out-NC on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

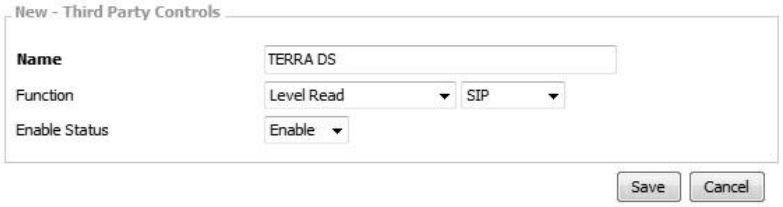
5.3.3.5.8 Level Control/Level Read

- Level Control: The 3rd party device sends a command to adjust the level of device.

  - Function: Select the source (SIP/MIC IN/LINE/MESSAGE/NET1/NET2/OUT1/OUT2/AMP1/AMP2/ AMP All/AGC Gain/Speaker/Headset/RJ9) you wish to adjust its level.

- Command-Level Control:
  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).
  - Adjust level: From the example picture above, if you wish to change the level of TERRA DS to 10dB, please send a command data as TERRA DS:10 on 3rd party UDP/TCP software.
  - Increase level: If you wish to increase 5 db, send a command data as TERRA DS: Increase 5 on 3rd party UDP/TCP software.
  - Decrease level: Send a command data as TERRA DS: Decrease 5 on 3rd party UDP/TCP software.

- Level Read: The 3rd party device sends a command to read back the level of source.

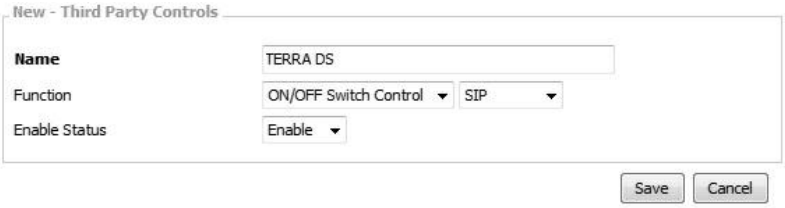


- Command-Level Read:

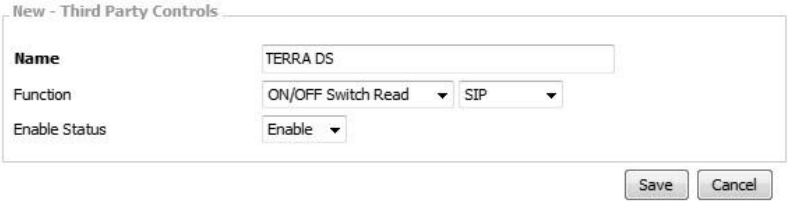
  Level Read: From the example picture above, if you wish to read the level of TERRA DS, please send a command data as TERRA DS on 3rd party UDP/TCP software, it will read and show the level dB which displays on Audio Matrix page.

5.3.3.5.9 ON/OFF Switch Control/Read

- ON/OFF Switch Control: The 3rd party device sends a command to switch on/off the Mute function of source (SIP/MIC/MESSAGE/NET1/MONITOR). The Mute function of source is located at Audio Matrix 71.



- ON/OFF Switch Read: The 3rd party device sends a command to read back the status (ON/OFF) of source.



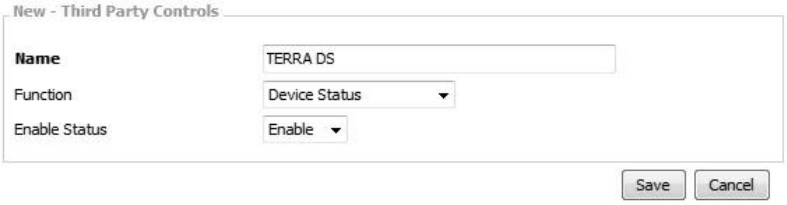
- Command-ON/OFF Switch Control/Read:

  From the example picture above, if you wish to mute the SIP source of TERRA DS, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.10 Device Status

The 3rd party device sends a command to read the status (Ready/Paging/Online/Offline) of device.



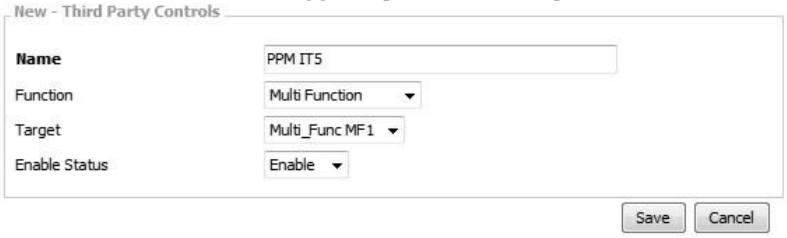
- Command-Device Status:

  From the example picture above, if you wish to view the device status of TERRA DS, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - Ready
  - Paging
  - Online
  - Offline

5.3.3.5.11 Multi Function

The 3rd party device sends a command to trigger a [Multi Function] action.



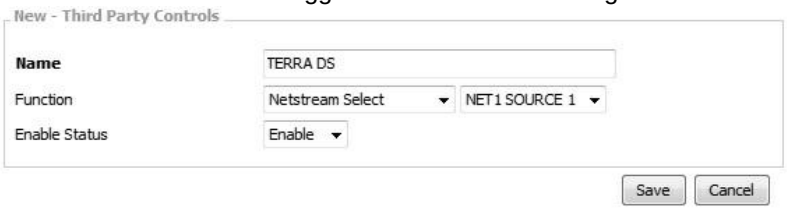
- Command-Multi Function:

  From the example picture above, if you wish to trigger a Multi Function action, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.12 Netstream Select

The 3rd party device sends a command to trigger the network streaming source.



- Function: Every Terracom device provides 8 sets of [Net Source], the setting of every [Net Source]

can be configured on Audio Matrix 71 chapter.

- Command-Netstream Select:

  From the example picture above, if you wish to trigger the network streaming source, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.13 Music Play/Music Stop

Music Play: The 3rd party device sends a command to play the music from Internal Play List/External Play List.

Music Stop: The 3rd party device sends a command to stop the music.

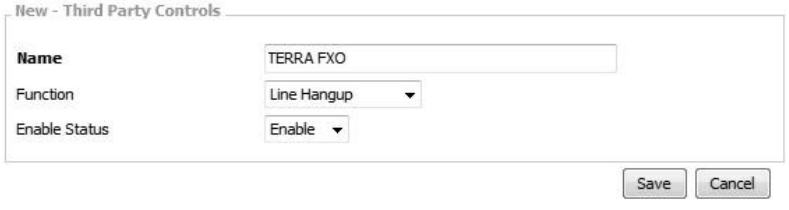
- Command-Music Play/Music Stop:

  From the example picture above, if you wish to trigger the Music Play/Stop action via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - 200 (ASCII Code) indicates OK (received).
  - 400 (ASCII Code) indicates NG (not received).

5.3.3.5.14 Line Hangup/Line Status (TERRA-FXO)

- Line Hangup: The 3rd party device sends a command to hang up a telephone call.



- Command-Line Hangup:

From the example picture above, if you wish to trigger the Line Hangup action via 3rd party device, please send a command data as TERRA FXO on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

- 200 (ASCII Code) indicates OK (received).
- 400 (ASCII Code) indicates NG (not received).

- Line Status: The 3rd party device sends a command to read the telephone line status (Call In/Ringing/ Disconnect/Ready/Online) of LINE 1 & LINE 2.

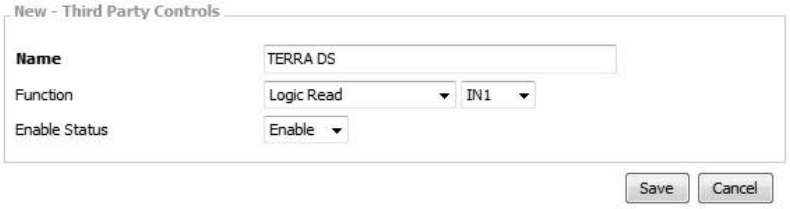
- Command-Line Status:

  From the example picture above, if you wish to read the Line Status via 3rd party device, please send a command data as TERRA FXO on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - Call In
  - Ringing
  - Disconnect
  - Ready
  - Online

5.3.3.5.15 Logic Read

The 3rd party device sends a command to read the status (NC-RC or NO-RC) of logic I/O.



- Function: Select the logic I/O (IN1/IN2/IN3/OUT1/OUT2) you wish to read its status.

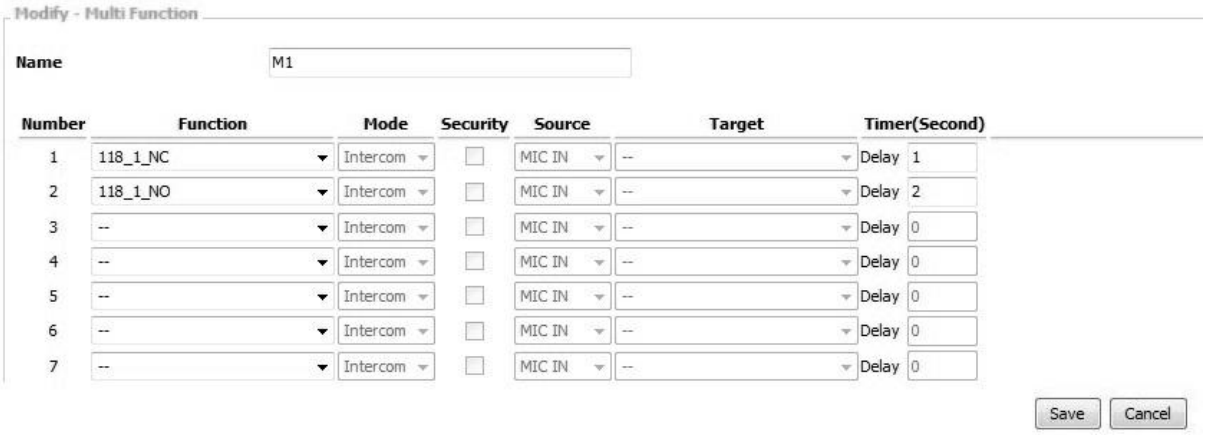
- Command-Logic Read:

  From the example picture above, if you wish to read the logic status via 3rd party device, please send a command data as TERRA DS on 3rd party UDP/TCP software. TERRACOM will answer back in ASCII code as below.

  - NC-RC
  - NO-RC

5.3.3.6 Multi Function

Create a group of action with multiple functions. There are three default function: [Call Function], [Hang up Function] and [Wait Device Status]. If user wish to trigger other action such as [Logic Out], please create an action on Function Libraries first, then the action you created will be listed on the [Function] drop-down box.

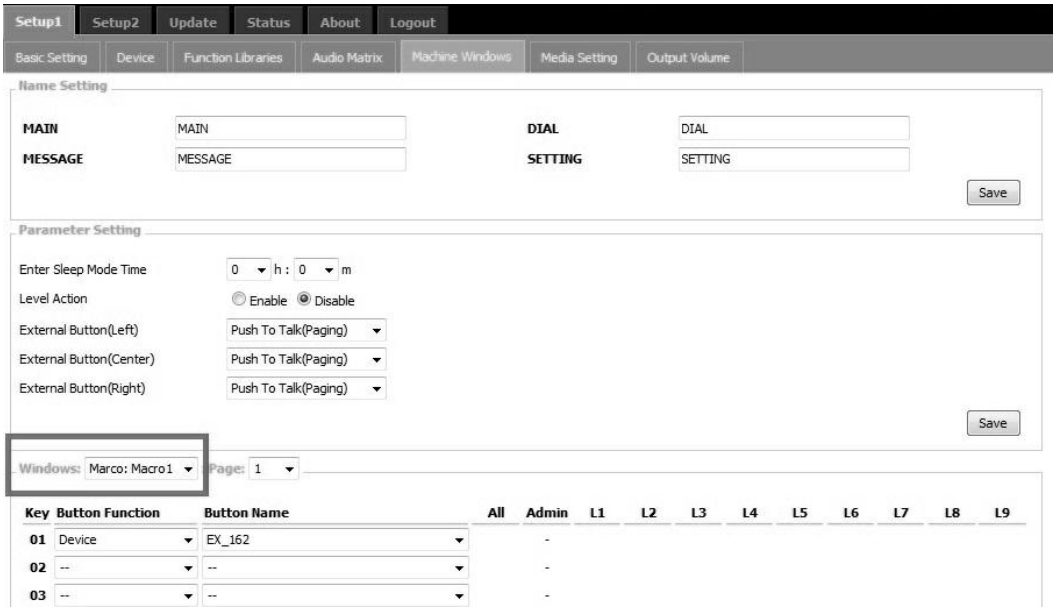


- Name: The displayed name of this [Multi Function].
- Function: The triggered actions in the list by orders.
- Mode: Choose the calling mode (intercom/paging/EVAC Announce/Vote Announce).
  - EVAC/Vote Announce: This two call modes are only applicable when using PPM-IT5 to paging to TERRA-RD. The paging priority: EVAC Announce > Vote Announce > Paging.
- Security: If the [Security] option is enable, the caller cannot hang up the call during paging unless the call receiver cancels the call itself.
- Source: Choose the triggered source (MIC IN or LINE IN) when the call has been triggered.
- Target: Choose the Terracom device as the target to paging/intercom/SIP/triggering logic etc.
- Timer (second): The delay time between the previous action and the next upcoming action in [Multi Function] list.

5.3.3.7 Macro (PPM-IT5)

Provide the management of the sub-page on PPM-IT5; Up to 14 pages can be saved at the main page window, and up to 2 pages can be saved at the sub-page window.

After created a new Marco button, go to Steup1 > Machine Window > Windows & Page 74 and set the Marco button you have created. See the picture as below.



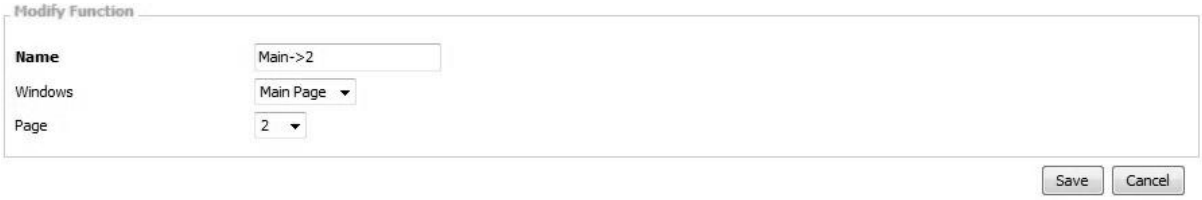
- Button Function: There are Device, Paging Group, Command (String), Logic Out (Single) and Locked Button.
- Button Name: The name of each button appears on the touch screen of PPM-IT5.

There is no way to move buttons from one Macro to another, you need to add these buttons manually.

5.3.3.8 Goto Button (PPM-IT5)

Allow to create a jumping page button on the touch panel of PPM-IT5. Users can customize the pages which reduce the difficulties for switching pages on the touch panel.

After created a Goto button, select the customized function users intend to change via PPM-IT5, then press [Save] button, and the jumping page function will be displayed on PPM-IT5.

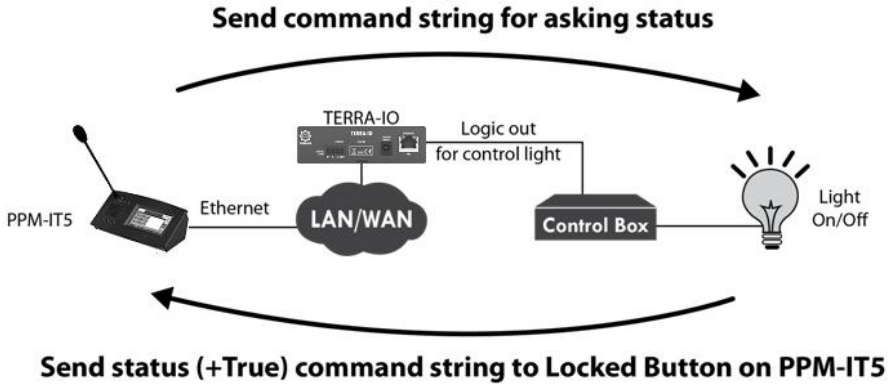


- Name: The customized name of each button appears on IT5's touch screen.
- Window: Select which window will display (Main Page/Macros) when user press this Goto button on IT5's screen.
- Page: Select which page intending to switch to.

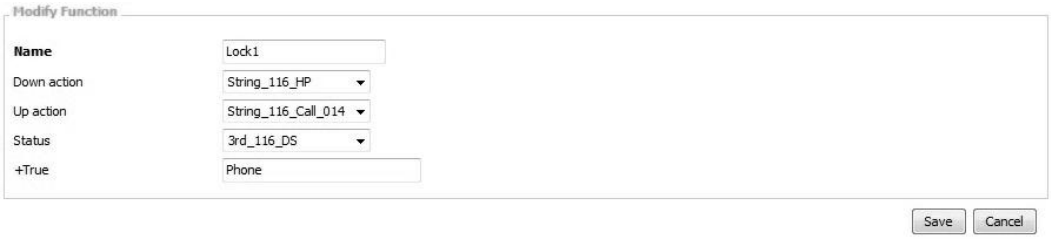
5.3.3.9 Locked Button (PPM-IT5)

The Locked Button allows to use the PPM-IT5 to send the command string to trigger the logic action and monitor the status of 3rd party device via LAN/WAN.

The diagram below is the example which shows how to combine those functions.



- The PPM-IT5 will send command (string) to the 3rd party device through the logic output of TERRA-IO, here we use a light as an external device.
- To monitor the status of light on/off, it will send a Status (+True) command string to PPM-IT5, and will update on the Locked Button of PPM-IT5.
- The display settings of the Status (+True) command string can be set from External Variable 62 function. If received the Status (+True) command from 3rd party device in 200ms, the color of Locked Button on PPM-IT5 will light up; if not, the color of Locked Button will remain in dark.
- After completed the setting, press the Locked Button on PPM-IT5 to control the light on/off with the TERRA-IO.



  - Name: The display name of this [Locked button], it will also appear on the touch panel of PPM-IT5.
  - Down/Up Action: The action when pressing the Locked Button on PPM-IT5. For example, the Down/Up action can be used as a Logic Out (Single) action for trigger the light on/off etc..
  - Status: Select which Command (string) action will be used on the Locked Button of PPM-IT5 to get monitoring status from 3rd party device.
  - +True: If received the Status (+True) command from 3rd party device in 200ms, the color of Locked Button on PPM-IT5 will light up; if not, the color of Locked Button will remain in dark.

5.3.3.10 External Variable (PPM-IT5)

The External Variable function allows the PPM-IT5 to send the command (string) to read the status of 3rd party device.

- Name: The display name of this [External Variable].
- Auto Update: Select which Command (string) action will be sent to the 3rd party device to get status.
- Display Offset: Set the number/text of display offset when receiving the [Auto Update] command action from the 3rd party device.

  For example, if the received status packet from 3rd party device is "ABCDE", the [Display Offset] is set as 2. The status will be "BCDE". Please note the display offset will also be based on the the setting of [End Rule] option.
- End Rule: There are three kinds of [End Rule] to display the received status command (string) from 3rd party device.

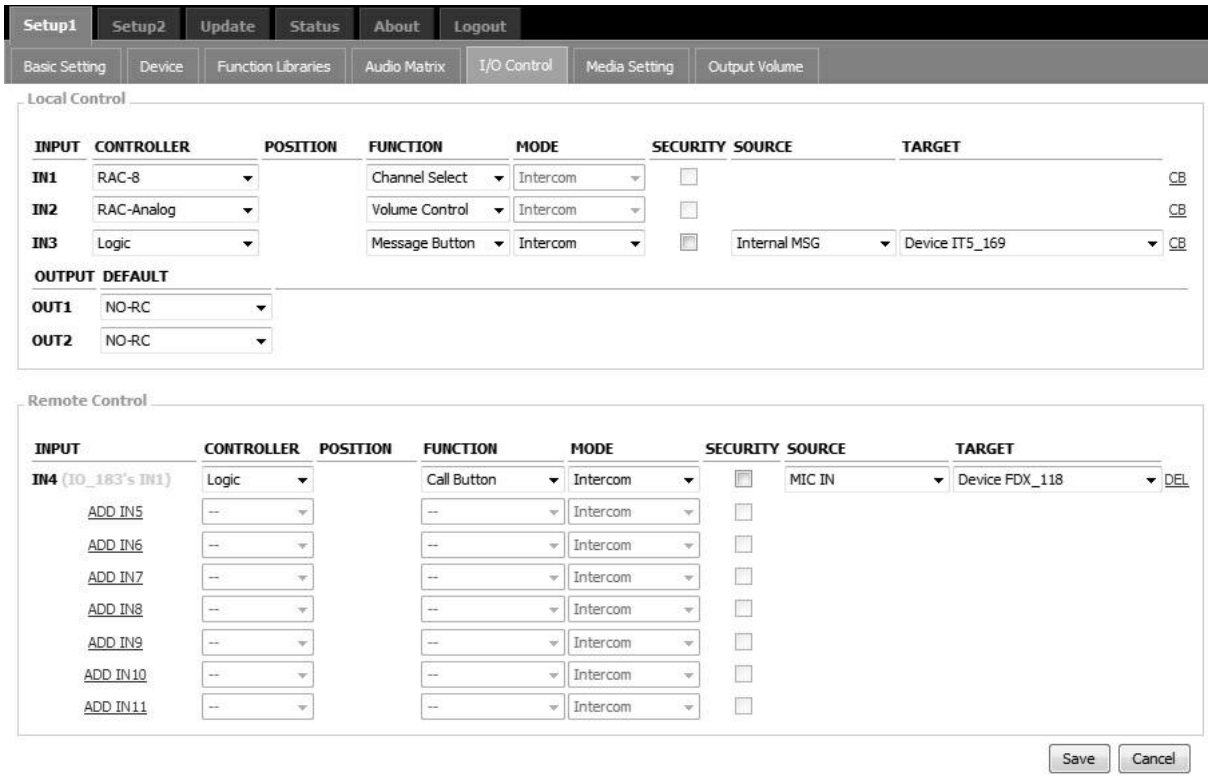
▪ Example 1: If the received status is "ABCDE": ➢ Set [Display Offset] as 3. ➢ Choose [None] option on [End Rule]. ➢ The display status will be "CDE".	
▪ Example 2: If the received status is "ABCDE": ➢ Set [Display Offset] as 3. ➢ Choose [Offset of display] option on [End Rule], and set [Offset] as 2. ➢ The display status will be "CD".	
▪ Example 2: If the received status is "ABCDE": ➢ Set [Display Offset] as 3. ➢ Choose [End character] option on [End Rule], and set [Character] as 68, which 68 indicates the D character in ASCII code. ➢ The display status will be "CD".	

5.3.4 I/O Control

Assign the controller such as logic input, RAC-5/8 and RAC-Analog with a triggered action to each control input. Most of the control processes will be introduced in Setup1 > Function Libraries 48 chapter, except for Message Button, Message Target/Trigger, On/Off Switch, Edge Trigger Button, RAC-

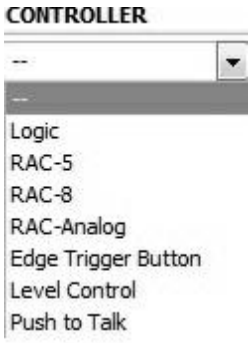
Analog and Push to Talk which don't need to work with a defined function.

5.3.4.1 Local Control



- Input: The control input which will be used to trigger an action, the IN1 means logic input channel 1.
- Controller: Choose a controller which will be used to control the action. The controller can be a logic, device (RAC-5/8, RAC-Analog) or other function, see the picture a below.

- Function:



Controller	Function
Logic	Call Button 65 Command (String) 65 Message Button 65 Call Trigger 66 Message Trigger 66 Logic Out 67 ON/OFF Switch 67 Multi Function 67
RAC-5/RAC-8	Call Target 66 Message Target 66 Channel Select 67 Play Target 68
RAC-Analog	Volume Control 68
Edge Trigger Button	Trigger Function 69 Message Call 69 Hang up 69 Music Play/Music Stop 69

Controller	Function
	ON/OFF Switch 69
Level Control	Music Play/Music Stop 70 ON/OFF Switch 70
Push to Talk	Call Button 69

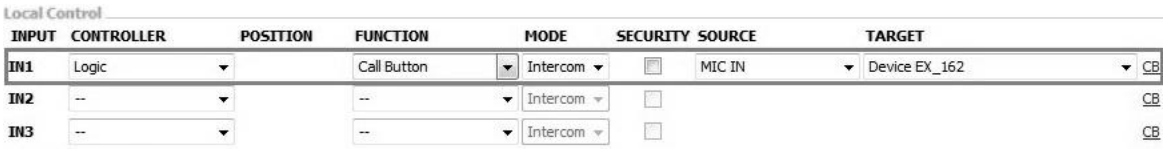
- Source: Assign which source will be used to trigger this action. It can be a MIC IN, LINE IN or internal/ external playlist.
- Target: Assign which Terracom device, Device Group or Control Input 1/2/3 you wish to activate this action.

Please proceed the CB (control calibrate) on your device for adjusting the minimum/maximum logic value before setting the function, see Control Calibration 88.

5.3.4.1.1 Logic-Call Button

The Call Button allows to intercom or paging using the MIC IN/LINE IN as a source to a chosen Terracom device target when pressing (activated) the button which is connected to the control input (IN1 means logic input channel 1).

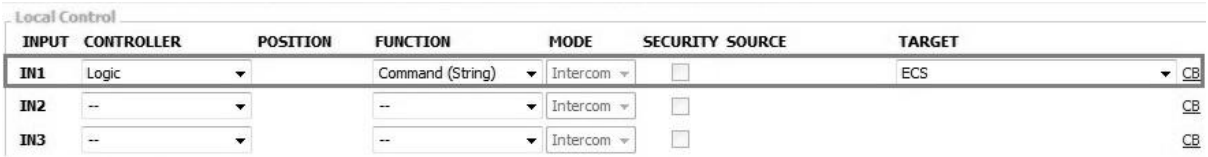
Press the connected button again to cancel intercom or paging.



- Mode: Choose the calling mode (intercom/paging/EVAC Announce/Vote Announce).
  - EVAC/Vote Announce: This two call modes are only applicable when using PPM-IT5 to paging to TERRA-RD. The paging priority: EVAC Announce > Vote Announce > Paging.
- Security: If the [Security] option is enable, the caller cannot hang up the call during paging unless the call receiver cancels the call itself.

5.3.4.1.2 Logic-Command (String)

Send command (string) to control the devices via 3rd party control.



- Target: Select a commend (string) action which is added from [Function Libraries].

5.3.4.1.3 Logic-Message Button

The Message Button allows to play the messages directly to a chosen Terracom device target when pressing (activated) the button which is connected to the control input (IN1 means logic input channel 1).

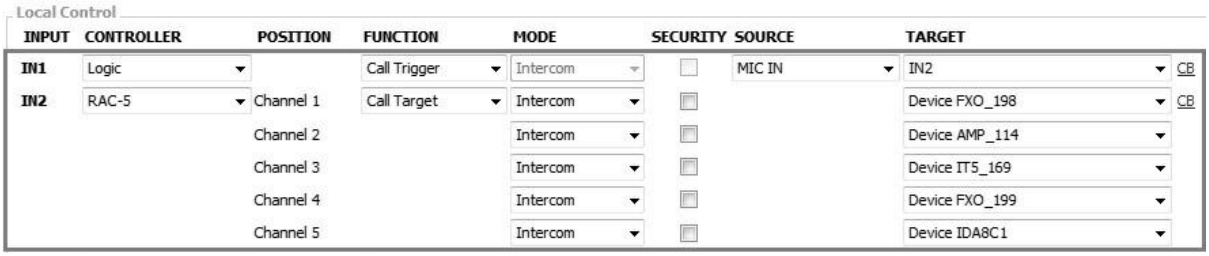
Press the connected button again to stop the message playing.

- Source: Select the playlist source which you have created on Media Setting > Internal playlist or on external playlist if a USB flash is connected.

How-to: Please refer to Message Paging 97 chapter.

5.3.4.1.4 Logic-Call Trigger & RAC-5/8 Call Target

The Logic-Call Trigger function is used to assign a logic input channel such as RAC to trigger the call, and here you can choose the MIC IN/LINE IN as the input source and which logic input (IN1 means logic input channel 1). This function needs to work with the RAC-5/8-Call Target, allowing each selection knob of RAC can be assigned with different mode (intercom/paging) and to different Terracom target.

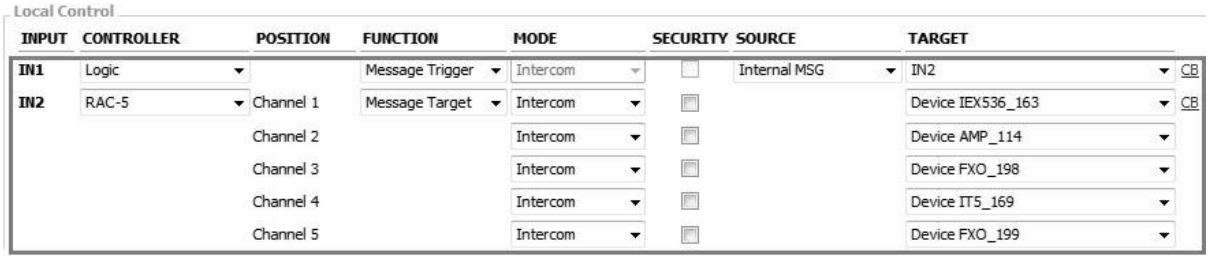


Once the settings are completed, user can switch the selection knob on RAC to the Terracom device target, and call the device.

5.3.4.1.5 Logic-Message Trigger & RAC-5/8 Message Target

The Logic-Message Trigger function is used to assign a logic input channel such as RAC to trigger the message play action and here you can choose the playlist source and which logic input (IN1 means logic input channel 1). This function needs to work with the RAC-5/8-Message Target, allowing each selection knob of RAC can be assigned with different mode (intercom/paging) and to different Terracom target.

The playlist source needs to be created on Media Setting > Internal playlist or on external playlist if a USB flash is connected first.

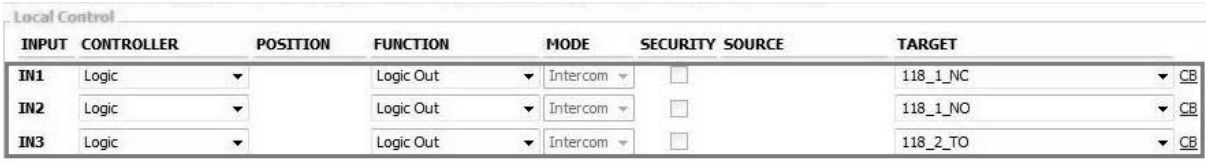


Once the settings are completed, user can switch the selection knob on RAC to the Terracom device

target you set on IN2 and play the message.

5.3.4.1.6 Logic-Logic Out

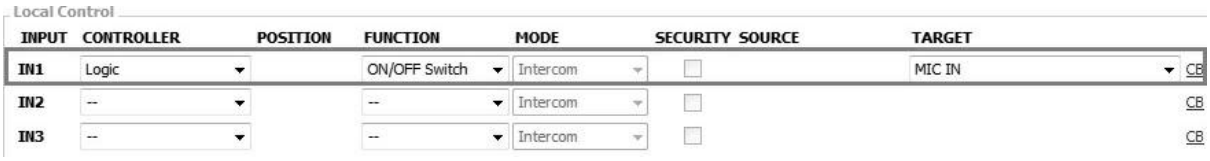
Use a Logic Out action to control the target you set on [Function Libraries].



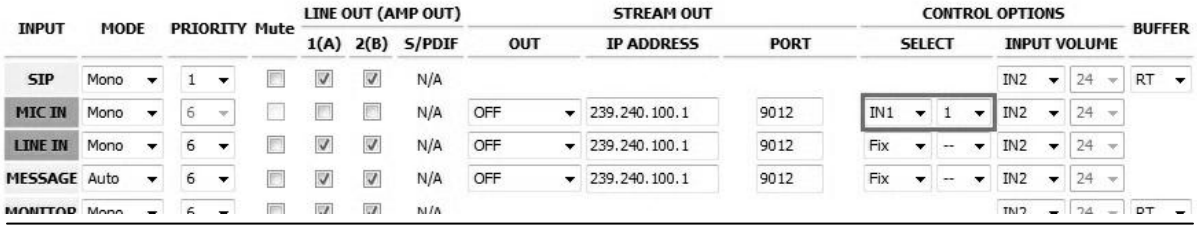
5.3.4.1.7 Logic-On/Off Switch

Switch on/off the mute function of source (SIP/MIC/MESSAGE/NET1/MONITOR) when pressing (activated) the button which is connected to the control input (IN1 means logic input channel 1).

The mute function of source is located at Audio Matrix 71.



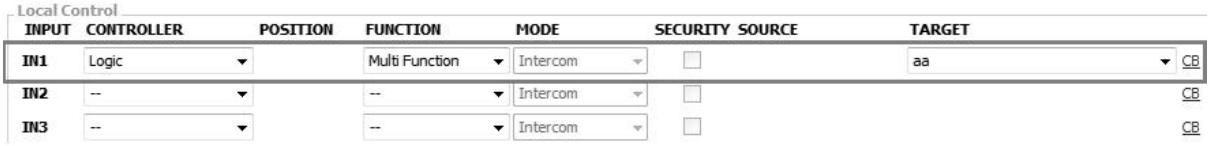
Once apply the setting, the MIC IN on Audio Matrix > Control Options > Select will change to the Control Input you set, see the picture below.



Please manually change the priority of MIC IN lower than the SIP calls. Even with the higher priority than LINE IN, the MIC only works when the button is pressed (SWITCH ON).

5.3.4.1.8 Logic-Multi Function

This function allows to trigger the Multi Function action which is stored in your Terracom device.

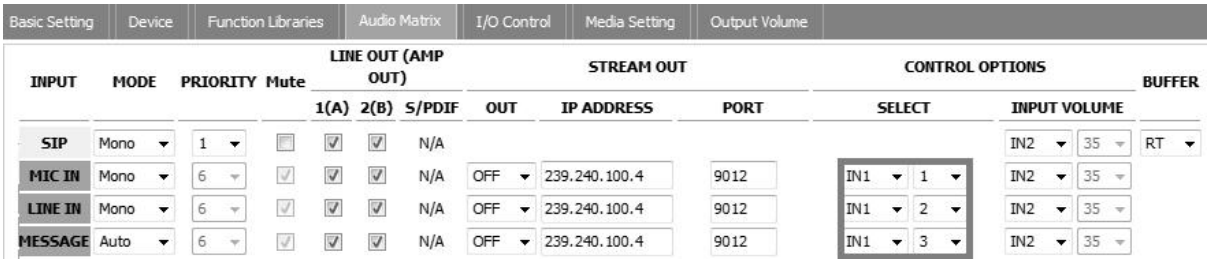


5.3.4.1.9 RAC-Channel Select

The RAC-Channel Select allows to switch the channel selection knobs on RAC-5/8 and change the source of MIC IN/LINE IN/MESSAGE input which the input channel is connected to the control input (IN1 means logic input channel 1).

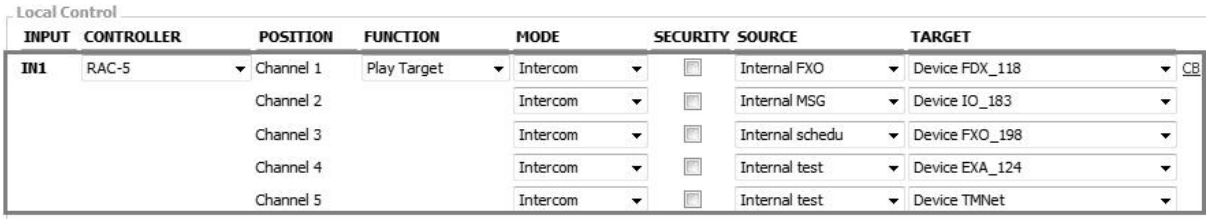
1. I/O Control: Set the Control Input.

2. Go to Audio Matrix page, and assign the source channels to the RAC knobs on [Select] function of [Control Option].



5.3.4.1.10 RAC-Play Target

The RAC-Play Target allows to assign each channel on RAC to use the selected message sources and intercom or paging to the Terracom device (s) target.

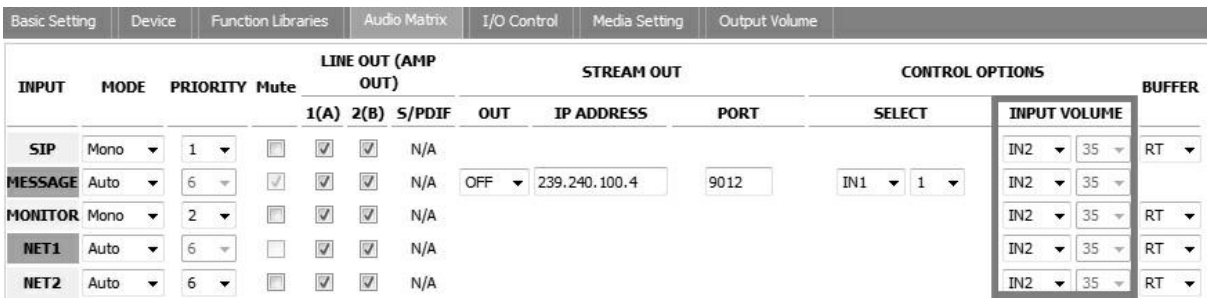


5.3.4.1.11 RAC Analog-Volume Control

Allow to control the volume of all audio outputs.

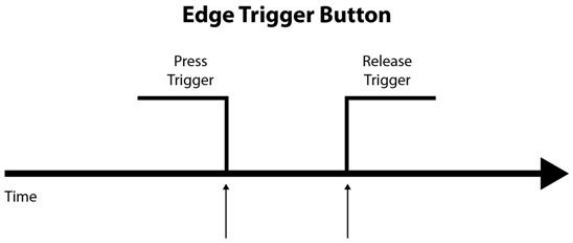
1. Go to [I/O Control] page and set one of the logic input with [RAC-Analog], and choose [Volume Control] function, allowing to turn the volume knob on RAC-5/8

2. Go to [Audio Matrix] page, and [Input Volume] will be dynamically changed via the volume knobs on RAC-5/8.



5.3.4.1.12 Edge Trigger Button

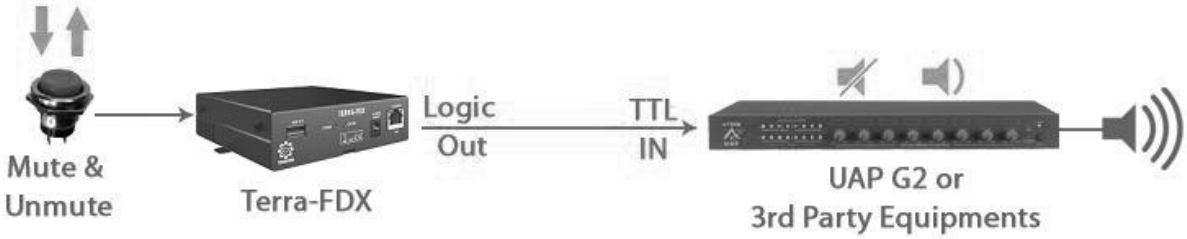
To trigger a Hi to Low (Press trigger) or Low to Hi (Release Trigger) action which is set via logic input (IN1 means logic input channel 1).



Local Control

INPUT	CONTROLLER	POSITION	FUNCTION	MODE	SECURITY	SOURCE	TARGET	
IN1	Edge Trigger Button	Release trigger	Music Stop	Intercom				CB
		Press trigger	Music Play	Intercom		--		
IN2	RAC-Analog		Volume Control	Intercom				CB
IN3	Logic		Message Button	Intercom		Internal schedu	Device TMNet	CB

- Release Trigger/Press Trigger:
  - Trigger Function: Set Hi to Low and Low to Hi action with the logic input action (Command String, Logic Out, Multi Function).
  - Message Call: Make a message call when release/press the button.
  - Hang up: Hang up the intercom/paging call.
  - Music Play: Play the music based on the internal/external playlist source.
  - Music Stop: Stop the music playing.
  - ON/OFF Switch: Switch on/off the Mute function of source (SIP/MIC/MESSAGE/NET1/ MONITOR).



Example Diagram: Edge Trigger Button-ON/OFF Switch

5.3.4.1.13 Push To Talk

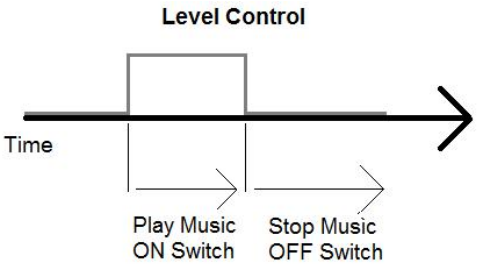
Paging/Intercom by constantly push the button which is connected to the control input (IN1 means logic input channel 1). Once the button is released, the paging/intercom status will stop.

Local Control

INPUT	CONTROLLER	POSITION	FUNCTION	MODE	SECURITY	SOURCE	TARGET	
IN1	Push to Talk		Call Button	Intercom		MIC IN	Device IT5_169	CB
IN2	Push to Talk		Call Button	Intercom		MIC IN	Device DS_12	CB
IN3	Push to Talk		Call Button	Intercom		MIC IN	Device EX_127	CB
IN4	Push to Talk		Call Button	Intercom		MIC IN	Device IO_183	CB

5.3.4.1.14 Level Control

Play/Stop the music or mute the audio source (SIP/MIC/MESSAGE/NET1/MONITOR) by Hi or Low level of logic input.



Local Control

INPUT	CONTROLLER	POSITION	FUNCTION	MODE	SECURITY	SOURCE	TARGET	
IN1	Level Control	Release trigger	Music Play	Intercom		Internal music list		CB
		Press trigger	Music Stop	Intercom				
IN2	--		--	Intercom				CB
IN3	--		--	Intercom				CB

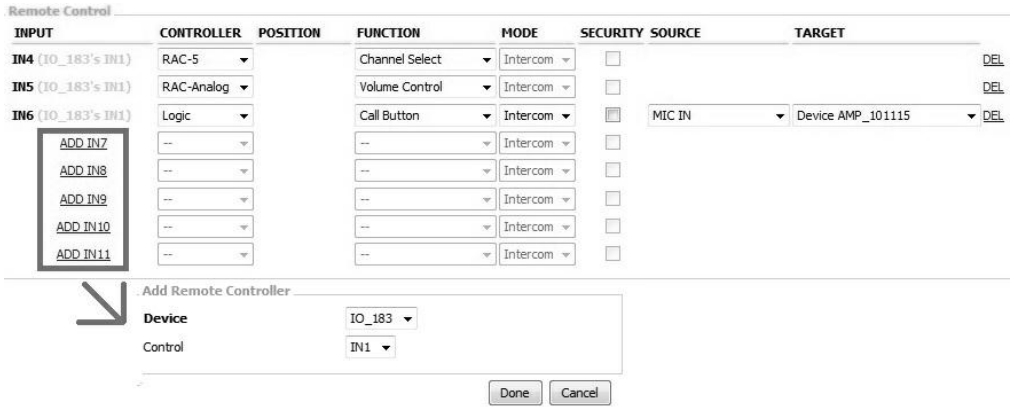
- Music Play: Play the music based on the internal/external playlist source.
- Music Stop: Stop the music playing.
- ON/OFF Switch: Switch on/off the mute function of source (SIP/MIC/MESSAGE/NET1/ MONITOR).

5.3.4.2 Remote Control

The Remote Control allows to expand the number of control inputs by TERRA-IO. See the diagram as below.

1. Go to [Device List] page and add a TERRA-IO device.

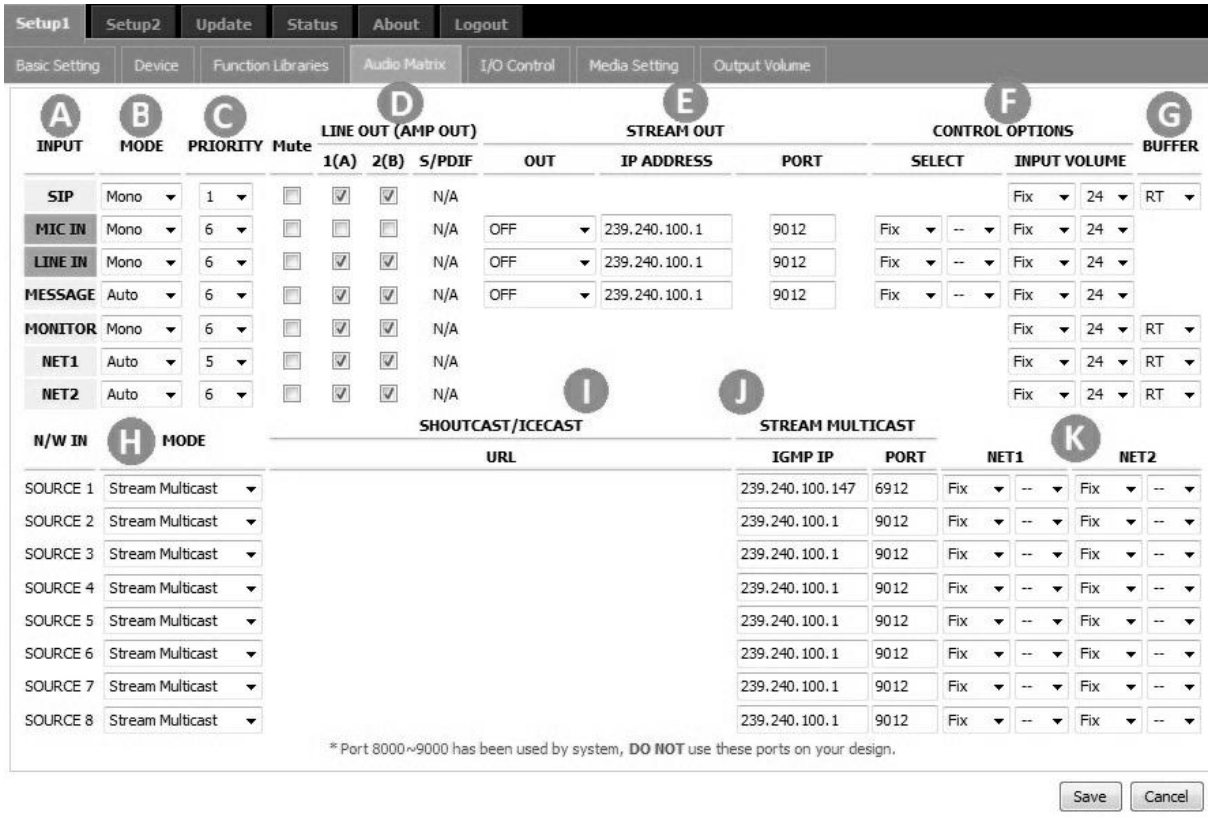
2. Go to the [I/O Control > Remote Control] and click ADD INx button to select the Device and Control input, then click [Done] button. After that, set the controller, function, source and device target to the corresponded input.



5.3.5 Audio Matrix

The Audio Matrix provides an interface to manage all audio in/output with the following functions as below.

- Audio routing with priority.
- Audio routing with RAC-5/8.
- Volume control depends on audio source.
- Announcement has different volume with music.
- Send network stream.
- Play network stream.



Ⓐ Input: The audio input sources.

- SIP: SIP calls.
- MIC IN/LINE IN: Input the audio from MIC IN or LINE IN.
- MESSAGE: Play message.
- NET1/NET2: Play network stream.

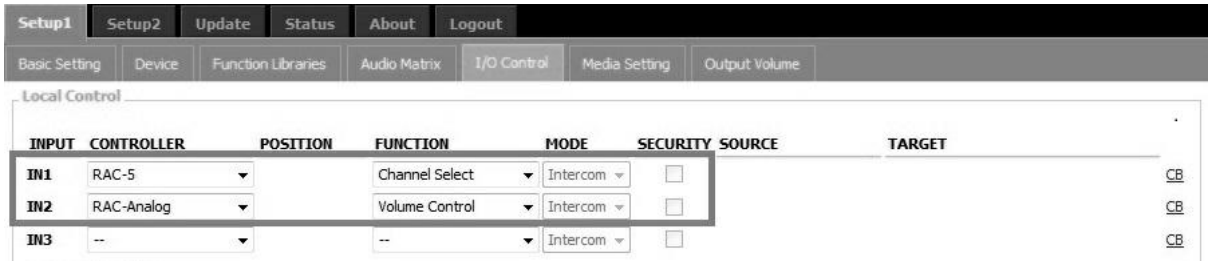
If the source priority of Input is the same, the priority order will be based on: SIP>MIC IN>LINE IN>MESSAGE>MONITOR>NET1>NET2.

Ⓑ Mode: Select Mono, Stereo or Auto depending on the input source. If set the Stereo mode for MIC/ LINE IN, the MIC IN will be as the left channel which outputs to the LINE OUT A; and LINE IN will be as the right channel which outputs to the LINE OUT B.

Ⓒ Priority: Set the priority of the SIP/MIC IN/LINe IN/MESSAGE/NET1/NET2.

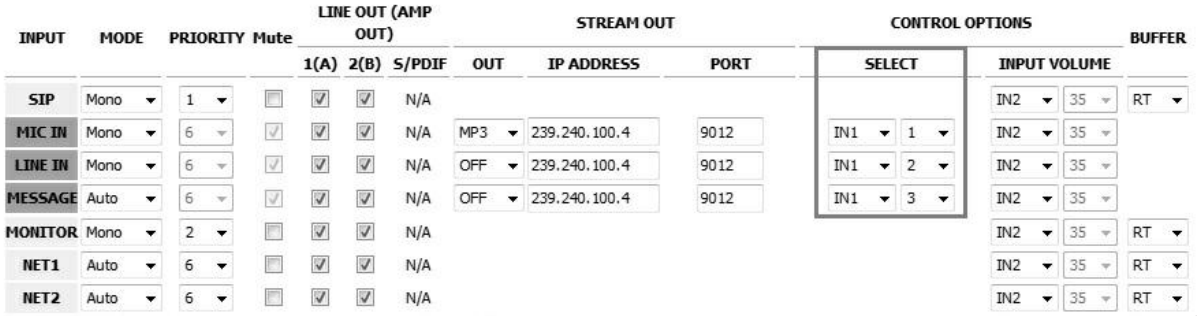
Always set the SIP's priority as "1" (the highest priority), otherwise the call will be left aside. The SIP includes Call, Paging Group and Pre-define Message.

Please note when selecting the control inputs as RAC on I/O control page, the priority selection here will be locked, users can manually switch the source on RAC instead. See the pictures as below.



I/O Control page

Back to the Audio Matrix page, the IN1 is RAC-5 sources selectors and IN2 is RAC's knob for volume control.



Audio Matrix page

Ⓓ Line Out (AMP Out): Tick the checkbox to enable the audio output channels. The current audio

outputs will be shown at the upper-right of the Terracom web interface. For example, it will display MESSAGE during message play.

E Stream Out: Send the network streams.

- Out: Choose the encoder of the MIC-IN and LINE-IN.
- IP Address: Set the Multicast Address between 225.0.0.0 ~ 239.255.255.255.
- Port: The RTP port should be an EVEN number.

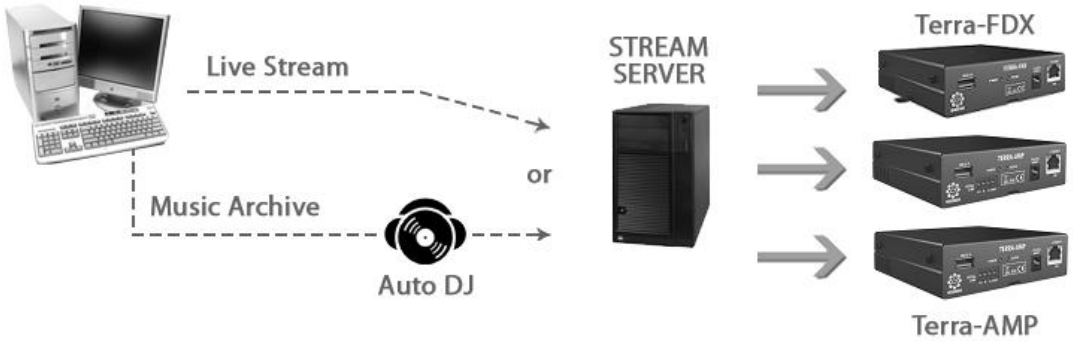
  ⚠ Port 8000~9000 has been used by system, DO NOT use these ports on your system configuration.

F Control Options:

- Select: Assign the channel of the RAC-5/8 to the audio control inputs (including the sources from network).
- Volume: Set a fixed volume or control it with the knob of RAC. See [I/O Control > RAC Analog-Volume Control 68] page.

G Buffer: The buffer time (by second) before the receiving input sources. This function will be particularly helpful for a Terracom system which multiple Terracom devices are located in different area and lots of network switches are connected, this will cause a delay time for audio transmission for the devices located at remote area, then please set the Buffer in longer delay time. If user wants to play the message audio in real-time for example, please set RT Buffer.

H Mode: Choose a received type of network stream on source 1~source 8.



I SHOUTcast/ Icecast URL: Receive the network radio using Shoutcast or Icecast. Set the URL of Shoutcast or Icecast. It may cause the sound quality problem if the audio received from the SHOUT cast/Icecast isn't in 48k sampling. To use an Icecast Streaming Media Server, please go to Icecast 107 chapter.

J Stream Multicast: Receive the network streaming using Stream Multicast. Set the IGMP IP and its

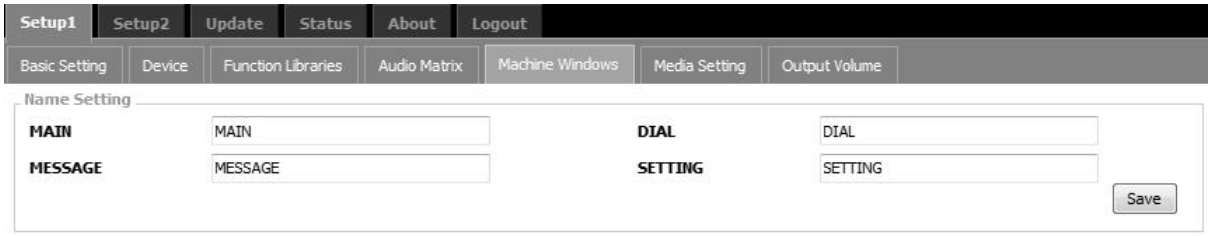
port. The IDA8 or TerraManager will use the Multicast type.

Net 1/Net 2: Assign the network stream to be switched by RAC5/8, there are two Net channels can be controlled by RAC5/8.

5.3.6 Machine Windows (PPM-IT5)

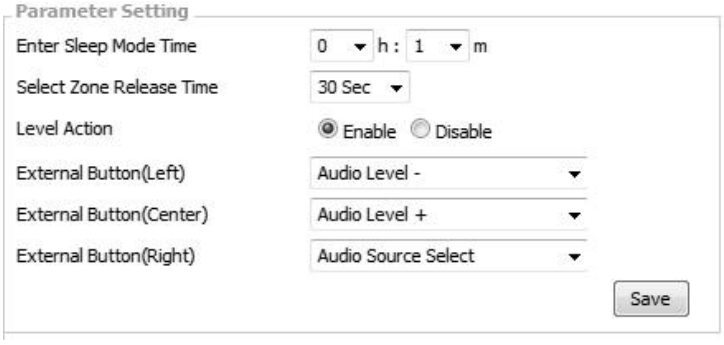
Allow to set the settings on the touch panel of PPM-IT5.

❖ Name Setting



- MAIN: The name shown on the Main page.
- MESSAGE: The name shown on the Message page.
- DIAL: The name shown on the Dial page.
- SETTING: The name shown on the Setting page.

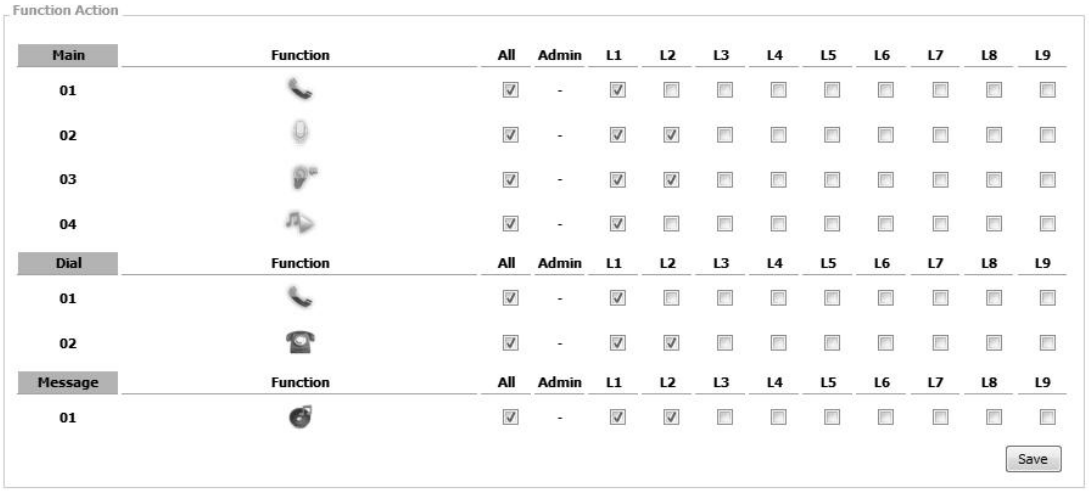
❖ Parameter Setting



- Enter Sleep Mode Time: Set the time to enter sleep mode.
- Select Zone Release Time: The release time which is the time selected zone button lights off on PPM-IT5.
- Level Action: Enable or disable the authorized [Level Action] function of PPM-IT5.
- External Button (Left/Center/Right): Set the button functions including Audio Source Select, Volume Control (Level + -) and Push To Talk (Intercom).

❖ Function Action (Level Action)

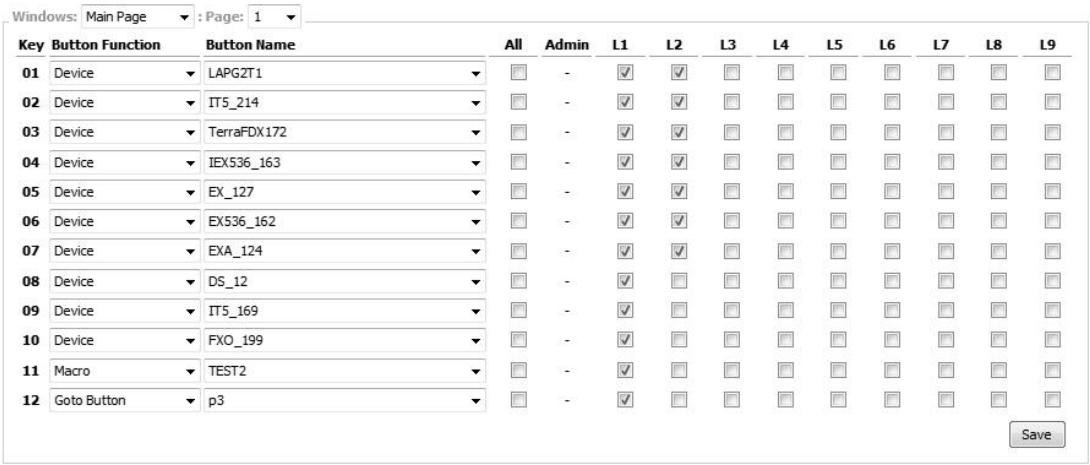
- Check Box: Enable or disable the user level (L1~L9) of each listed function on PPM-IT5, users need to enter the [User ID] and [Password] before making a call, paging, etc.
  - All: Tick [All] checkbox to select L1~L9 authorized levels.
  - L1~L9: The authorized level of L1~L9 can be user-defined.



You can manage the accounts, user's ID and change the password on Account Management 84 chapter.

This section appears when users enable the [Level Action] on Parameter Setting.

❖Windows & Page



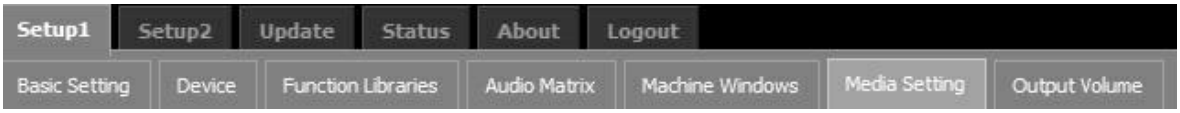
- Windows: The current operation panel, including Main Page and Macro List.
- Page-Main & Marco Page: Support up to 14 pages of button setting on Main Page, and 2 pages on Marco Page.
- Key-Main & Marco Page: Support up to 168 individual keys setting on Main Page, and 24 keys on Marco Page.
- Button Function: Choose the triggering actions, including Device, Command (string), Logic Out

etc. The Device action here indicates as a device zone which allows to proceed intercom or paging.

- Button Name: The device to execute the triggering actions.
- All: Tick [All] checkbox to select L1~L9 authorized levels.
- L1~L9: The authorized level of L1~L9 can be user-defined. See the picture above as an example, all the checkboxes in L1 are enabled, which makes L1 is in the highest authorized level, in other words, all the Button Functions can be accessed on PPM-IT5. The button which is not in L1 will display as a light-off button which cannot be selected on PPM-IT5.

5.3.7 Media Setting

The management of the audio, files, messages list, recording setting and play list.



5.3.7.1 File Access

- File Directory: The file path where you like to store the files.
- Please select a file to store: Click [Choose File] button to select the file you want to store, then click [Store] button. Click [Delete] button to delete the file listed on File Directory.
- Reverse: Download the file which is stored in the TERRACOM device to your PC/Laptop. First, click the icon of the file on [File Browser], see the picture as below. If the file has listed on [File Directory], then click [Reverse] button to download it.

- Create: Click to create a new file folder.

Please note that the specification of files (banners, logo, gif files) needs to be followed by the standard format in order to be read by the system.

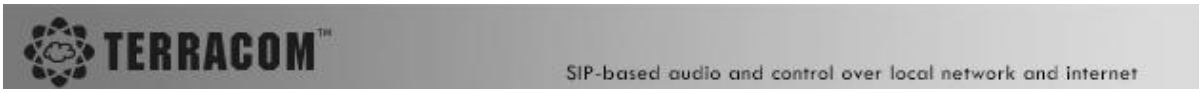
1. Logo:

- Size: 80*80
- Format: bmp
- Name: logo.bmp

2. About:

- Size: 348*232
- Format: gif
- Name: about.gif

3. Banner:

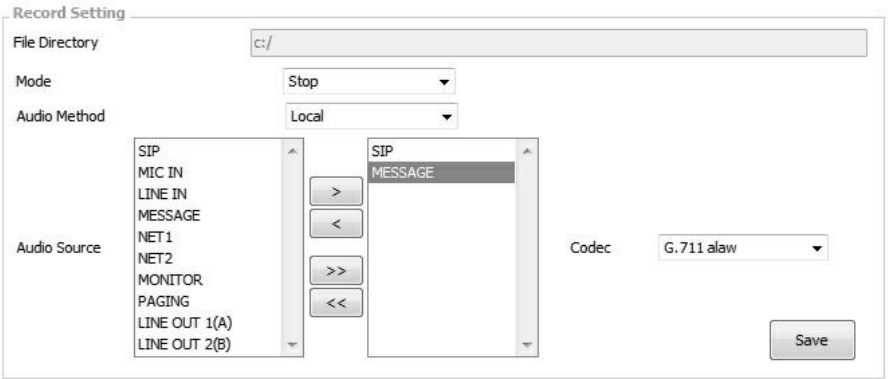


- Size: 629*47
- Format: jpg
- Name: banner.jpg

4. Message:

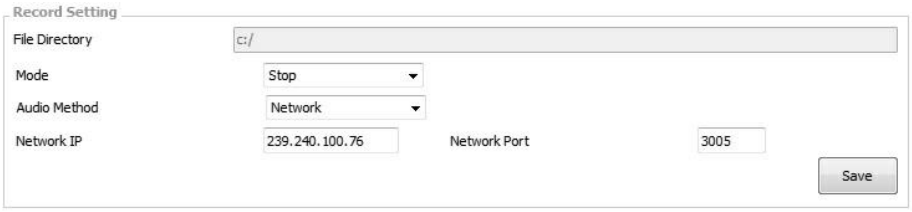
- Size: Less than 10MB
- Audio Codec: WAV, MP3, G.711 and G.722.

5.3.7.2 Recording Setting



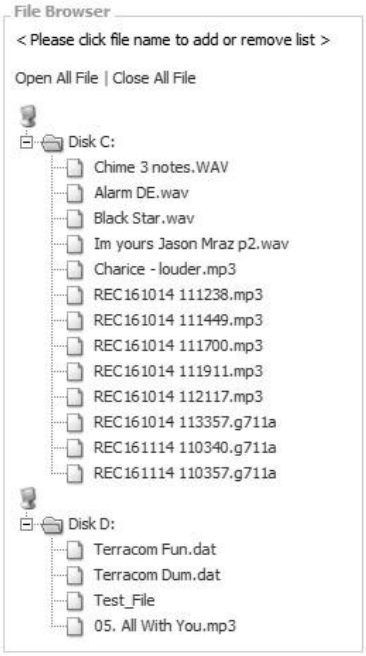
- File Directory: The file path where you like to store the recording files. Please note the storage space is 2MB.

- Mode: When the recording file is too big to store or the storage capacity is not enough, users can choose to Rewrite/Stop.
  - Rewrite: Rewrite the file from the first recorded file when the memory storage is full.
  - Stop: Stop recording if the memory storage is full.
- Audio Method: Choose which method to input the audio source either from Local Terrcom device or Network.
  - Local: Record the audio source by using the MIC IN, LINE IN etc. of local Terracom device. Select the sources which user wishes to add it in the [Audio Source], click [>] and [>>] button to add one or all the sources or click [<] or [<<] button to remove one or all the sources from the left side to the right side.
    - Codec: Set which audio codec (WAV, G.711 ulaw, G.711 alaw, G.722, MP3) the recording file will be saved as.
  - Network Recording: Record the audio source from the network. Please set the Network IP address and Network Port.



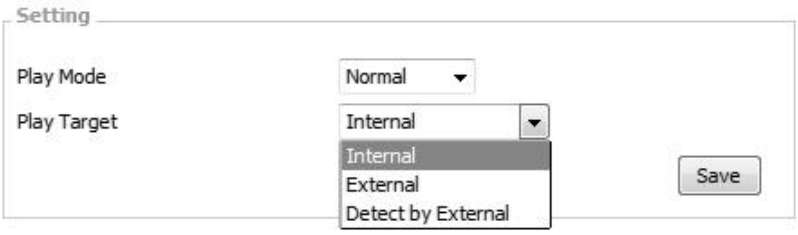
5.3.7.3 File Browser

Display all the internal/external audio files that can be stored into the device.



When an USB device is connected to the Terracom device, it will automatically detect its file folder, and the files can be saved into a Internal/External Play List.

5.3.7.4 Play Setting

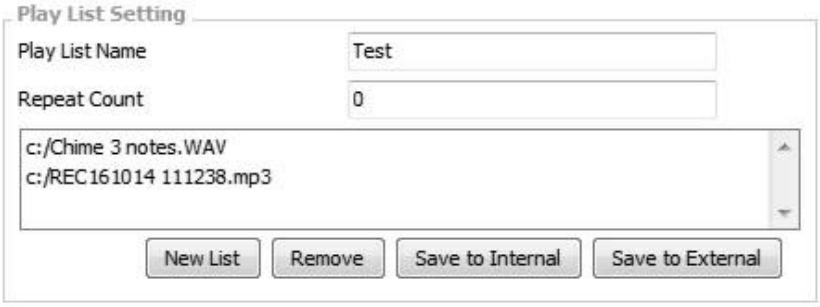


- Play Mode: Select the play mode of your messages.
  - Normal: Play all the audio files on [Play List Setting] once.
  - Repeat all: Play the audio files on [Play List Setting] repeatedly in order.
  - Random: Play the audio files on [Play List Setting] randomly.

In this area, your changes will be auto saved. Remember to set the Priority (right after the SIP) of USB at the "Audio Matrix" page if you want it auto-plays right after booting tone. Also, the Terracom device will load the last setting after reboot.

- Play Target: Choose the target source (internal, external) of your audio files.
  - Internal: Choose the internal storage as your play target.
  - External: Choose the external USB as your play target.
  - Detect by External: Choose the external USB as the first priority, then auto choose the internal storage as the secondary one if external USB cannot be detected.

5.3.7.5 Play List Setting



- Play List Name: Enter the name of your play list.
- Repeat Count: This function is only applicable when playing the message on SIP based.

If you set the [Repeat Count] as 0, this indicates the audio files listed on the [Play List Setting] will only play once, and set the [Repeat Count] as 1 indicates that the audio files will play twice, set as 65535 to play the list forever.

If no playlist exists, it will automatically create a new playlist of all supported files in the USB.

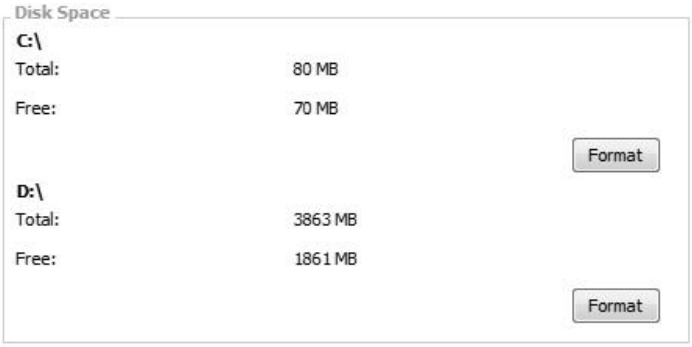
- New List: Click [New List] to add a new empty playlist.
- Remove: To remove the audio file from the playlist, click the file first, then click [Remove].
- Save to Internal/External: Once the files have been added into the playlist setting, click [Save to Internal] or [Save to External] to create a new playlist.

❖ If you would like to know how to play the messages on SIP based. Please refer to the Message button 65 chapter.

5.3.7.6 Internal/External Play List

- Function:
  - Edit/Delete: Click the Edit/Delete button to edit/delete the playlist.
  - Copy to internal/external: Copy the same playlist you select to Internal/External Play List.
- Music Database Playlist: Tick the checkbox of the internal/external playlist you wish it to be played as background music. See Play Music/Message from Internal/External Play List 98 for more information.

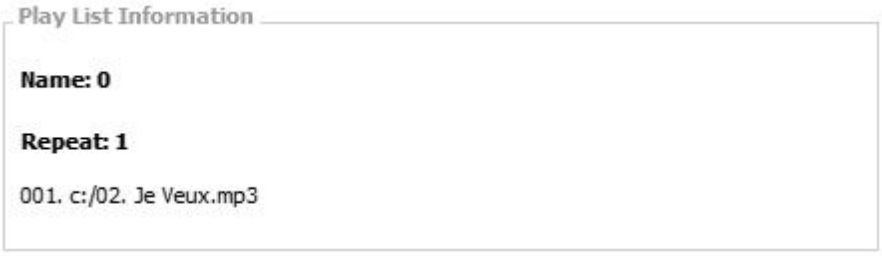
5.3.7.7 Disk Space



- Total: Display the total memory capacity on the device.
- Free: Display the capacity of your device that has left for use.
- Format: Click to format the disk.

Please note that the data will be deleted after formatting.

5.3.7.8 Play List Information



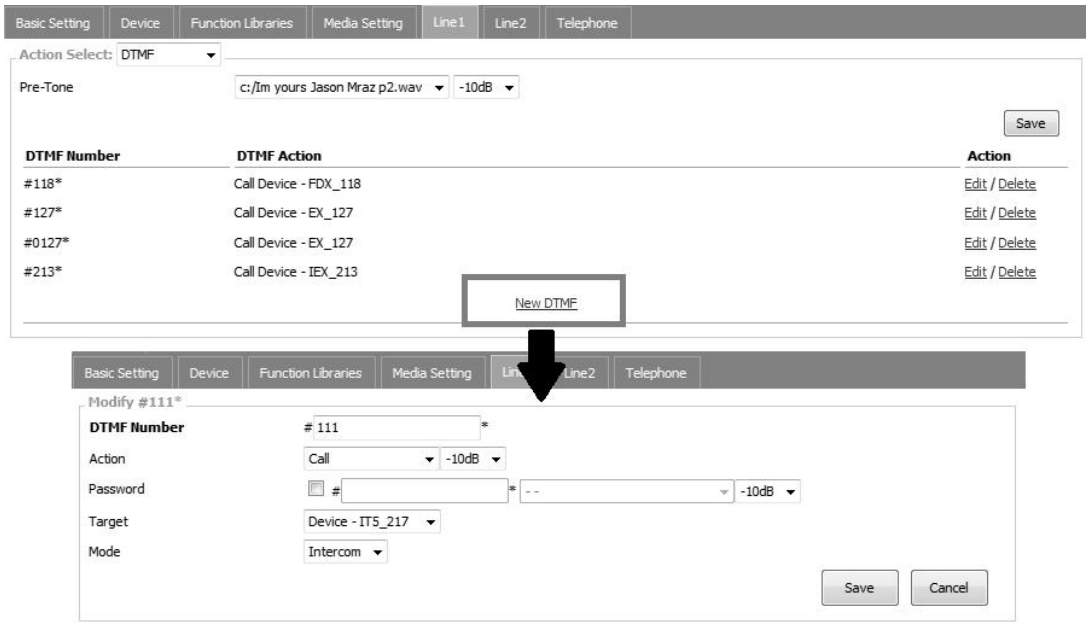
- Click the file listed on [Internal Play List] and the file information such as file name, etc. will be listed here.

5.3.8 LINE1/LINE2 (TERRA-FXO)

The LINE1/LINE2 page can create the DTMF call setting, set the pre-tone etc., allowing traditional telephone to call TERRA-FXO.

The LINE1/LINE2 will appear in the Setup menu of TERRA-FXO only.

❖ DTMF-Add New DTMF



- DTMF Number: Type the DTMF telephone numbers.
- Action: The action that the TERRA-FXO will perform. Click the drop-down list to select the action.
- Password: Enable the password function by typing the numbers, and select a message file as an indication message before typing the password numbers.
- Target: Select which Terracom device (device group) target to receive the call from the traditional telephone.
- Mode: Choose the calling mode (intercom/paging/EVAC Announce/Vote Announce).

- EVAC/Vote Announce: This two call modes are only applicable when using PPM-IT5 to paging to TERRA-RD. The paging priority: EVAC Announce > Vote Announce > Paging.

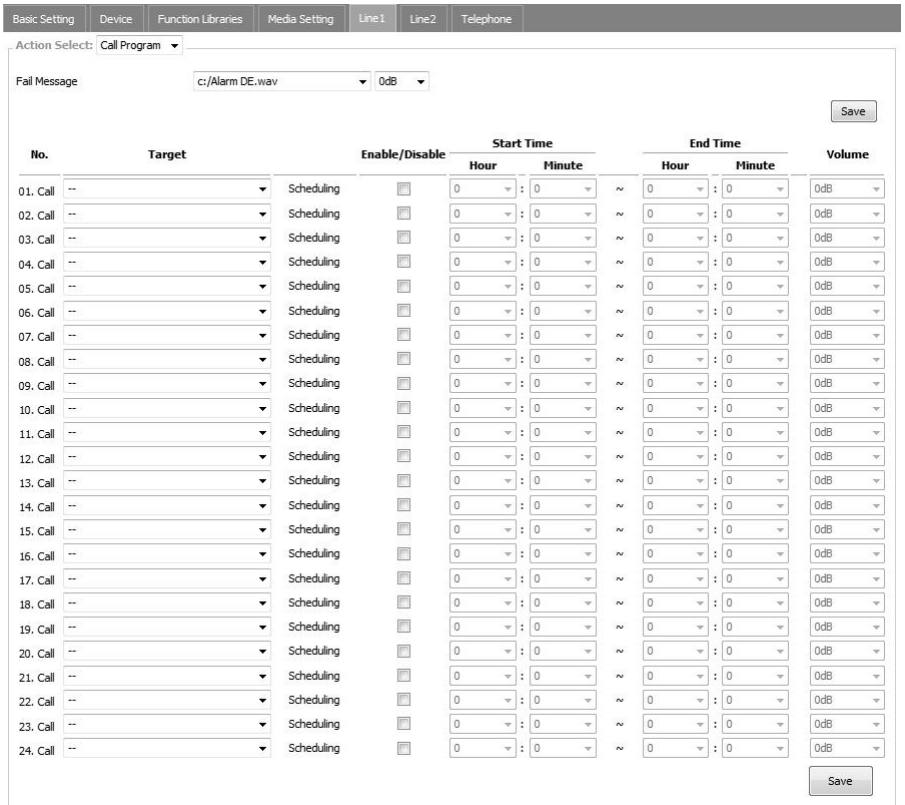
❖ DTMF-Add Pre-Tone

When calling the DTMF number using TERRA-FXO, a pre-tone will be played.

- Pre-Tone: User requires to upload your audio files [WAV (16k 16bit)] for pre-tone on [Media Setting] page first. Please note the storage space is 100 MB.

❖ Call Program

Set the call scheduler to call Terracom devices in group. There are 24 sets of setting time periods in total.

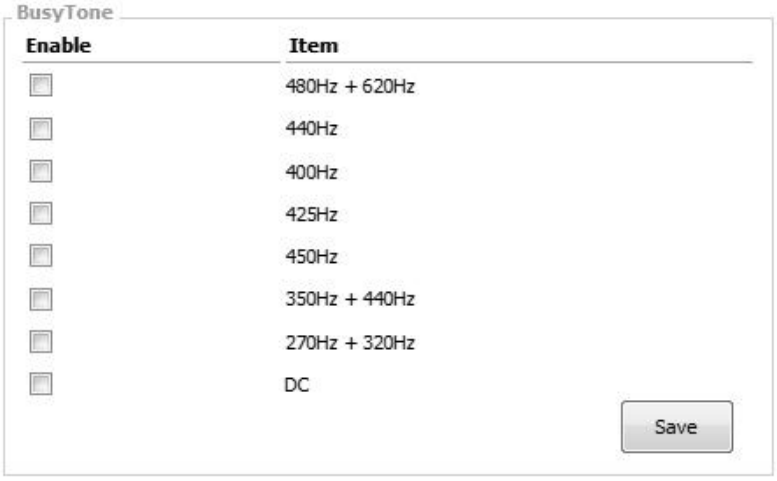


Fail Message: There will be a tone sound to indicate if the call message is unable to dial. Please check whether users have set the time of dialing or whether either no one answers the phone or the telephone line is busy can occur this issue.

5.3.9 Telephone (TERRA-FXO)

The [Line 1 Hangup] and [Line 2 Hangup] function can be manually operated via web interface.

Users can define when the device will hangup the call device by the frequency of [Busy tone]. See the picture as below.



5.3.10 Output Volume

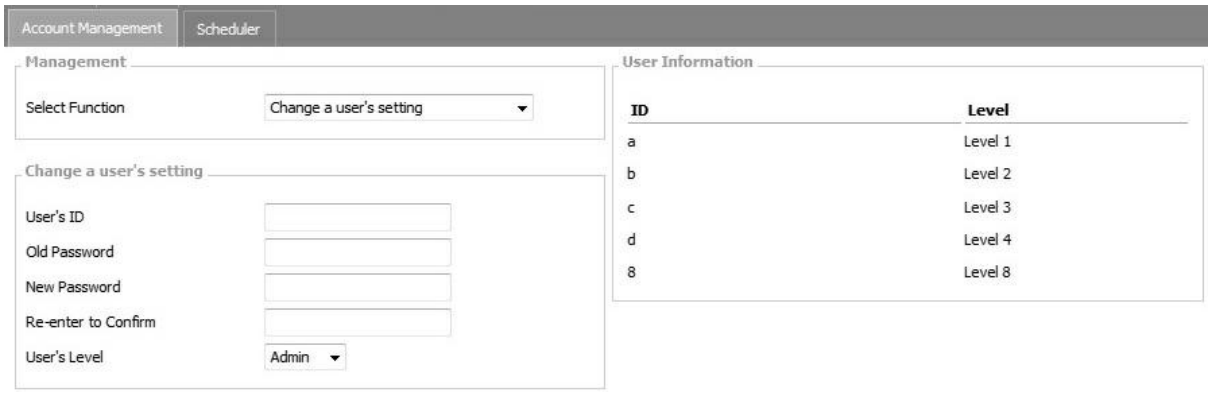
This function allows to control, modify the volume of output 1, output 2, speaker output (TERRA-DS and PPM-IT5), AMP1/AMP2 (TERRA-AMP), RJ (PPM-IT5), Handset (PPM-IT5).

- Volume: Set the output volume.

5.4 Setup 2

5.4.1 Account Management

Manage the accounts such as add/delete a user's ID and change the password.



The default account is [User Name]: admin, [Password]: admin

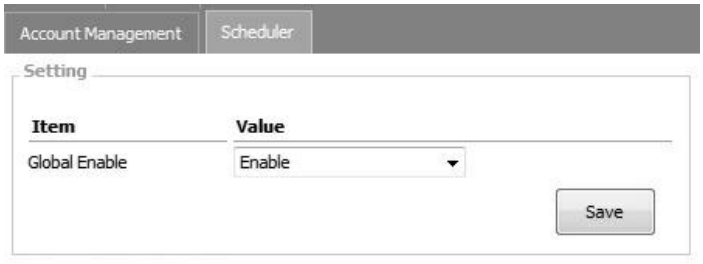
1. ateis / ateis
2. user1 / user1
3. user2 / user2
4. user3 / user3

- Management-Selection Function: If you want to change an existing account, the old password is required.
  - User's ID: Enter your ID.
  - Old/New Password: Enter your old/new password.
  - Re-enter to Confirm: Enter your new password again for confirmation.
  - User's Level: Set the current ID's permission. The authorized level of L1~L9 can be user-defined.

5.4.2 Scheduler

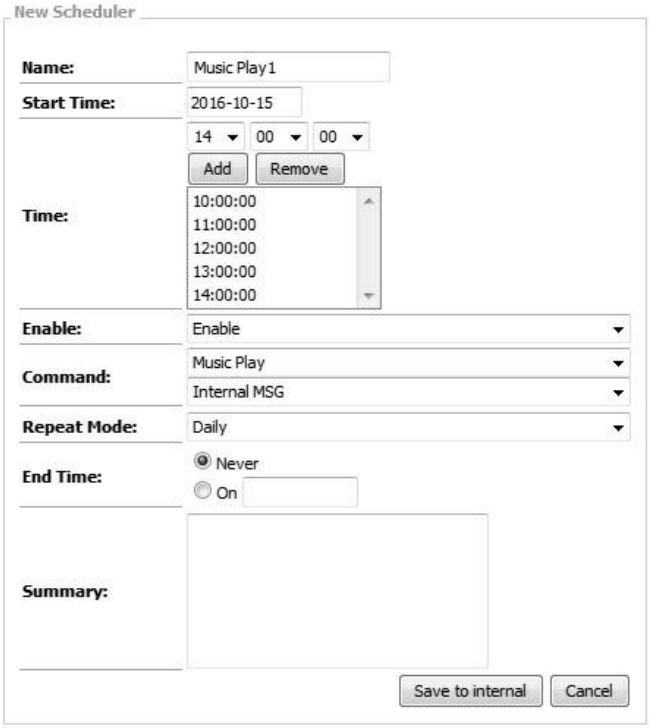
The Scheduler function allows to schedule the actions such as messages/music playing, command (string) triggering, logic out (single) in an assigned time, and these actions will be triggered in the assigned time.

- Setting:



Global Enable: Enable or disable to trigger all the Scheduler actions.

5.4.2.1 New Scheduler

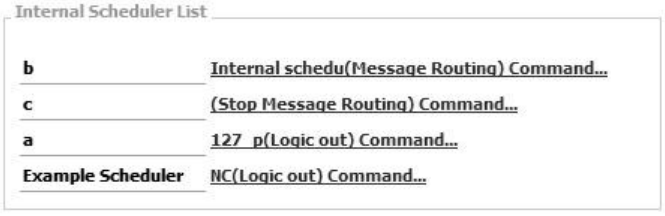


- Name: The display name of this scheduler.
- Start Time: The start time of this scheduler.
- Time: Set a sequence of trigger time from 00:00 to 23:59.
- Command: Select the command action Logic Out, Command (String) and Message Routing etc.
- Repeat Mode (YYYY/MM/DD):
  - Daily/Monthly/Yearly: Trigger this Scheduler action every day/every month/every year.
  - Weekly: Trigger this Scheduler action weekly, you can choose the weekdays.

If you want to repeat two or more days monthly or yearly, please set another scheduler.

- End Time: Set the ending time of this scheduler.
- Summary: Memo area.

5.4.2.2 Internal Scheduler List



Here you can check the scheduler events you have created. Click the content for editing or to delete.

5.4.2.3 In-Store Scheduler List

Display the scheduler events which are sent from TerraServer.

5.5 Update

5.5.1 Firmware

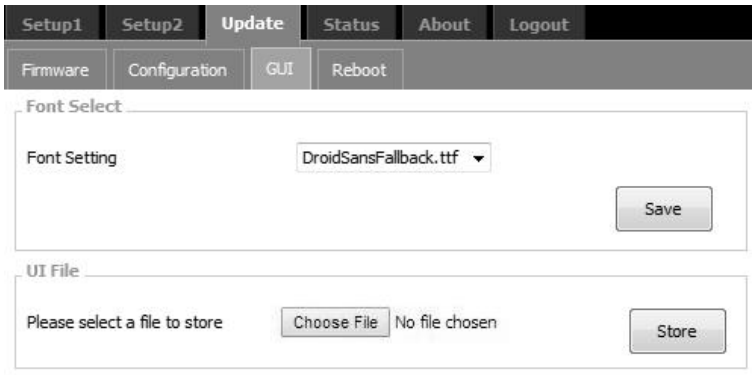
Firmware: Click [Browse] button to upload a firmware file.

5.5.2 Configuration

- Reverse Settings: Click [Reverse] button to download the configuration backup file to your PC/Laptop.
- Store Settings: Click [Browse] button to select a configuration file and store into the current configuration.

5.5.3 GUI

GUI (PPM-IT5): Allow to change the font size and language of the main buttons. The new settings on PPM-IT5 will be changed after rebooting.



- Font Setting: Set the font style on PPM-IT5. The PPM-IT5 supports multi-languages.

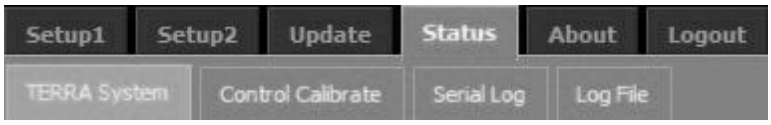
Please note the font you have stored into your PPM-IT5 requires to support multi-languages as well.

- UI File: Click [Browse] button to select the custom UI background settings on PPM-IT5.

5.5.4 Update Reboot

Reboot: Click to reboot the Terracom device.

5.6 Status



❖ TERRA System: Show the general information of the Terracom unit.

❖ Control Calibrate: Display the calibration result of control input.

❖ Serial Log: Display the history data sent through the serial port (RS232/RS485) of Terracom device.

❖ Log File: Display the logs, it supports to load up to 3000 data.

5.6.1 TERRA System

❖ Stream Out: Display the STREAM OUT at "Setup1 > Audio Matrix 71". The numbers and items are depending on the Terracom unit you're using, N/A means the item is not supported for now. The status will switch to "ON" when the Stream Out has streamed out and successfully received by other devices.

STREAM OUT

Name	MODE	IP ADDRESS	PORT
MIC IN	N/A	N/A	N/A
MESSAGE	N/A	N/A	N/A

❖ MIC Status

MIC Status

Name	Status	Value	
MIC	Normal	36	CB

❖ Device Information:

Display the status of device.

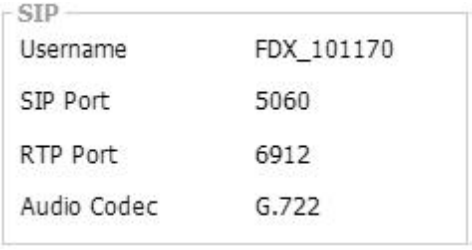
Device Information

DHCP	DISABLE
MAC Address	00-19-84-ca-01-16
IP Address	192.168.101.116
Subnet Mask	255.255.252.0
Gateway	192.168.100.254
DNS	DISABLE
Serial Port	RS485

❖ SIP:

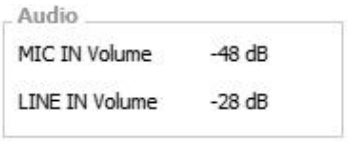
Display the SIP information.

The SIP settings can be changed from "Setup1 > Basic Setting > SIP 44".



❖ Audio:

Display the status of audio.



❖ Fault:

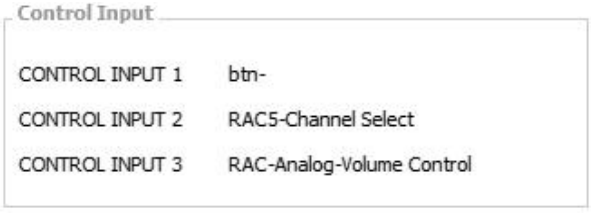
- Nand Flash Error: The FLASH problem of sending/ receiving in hardware device.
- AIC3X Error: The IC AIC3X problem of communication in hardware device.
- ADS7830 Error: The IC ADS7830 problem of communication in hardware device.
- PCF8574 Error: The IC PCF8574 problem of communication in hardware device.
- TAS5709 Error: The IC TAS5709 problem of communication in hardware device.
- SPI Flash Error: The SPI FLASH problem of sending / receiving in hardware device.
- SI3050 1 ERROR: The IC SI3050 1 problem of communication in hardware device.
- SI3050 2 ERROR: The IC SI3050 2 problem of communication in hardware device.

When the fault occurs, the fault will display on the Fault List on the [Status] window of web interface and the Fault LED on the Terracom device will light up.

5.6.2 Control Calibrate

Display the calibration status of contact input.

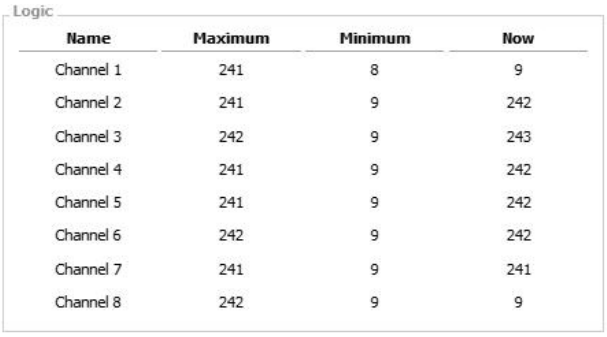
- Control Input: Display the type of control input and its function.



From the picture above, the Control Input 1 displays the "btn-" which indicates no logic input is

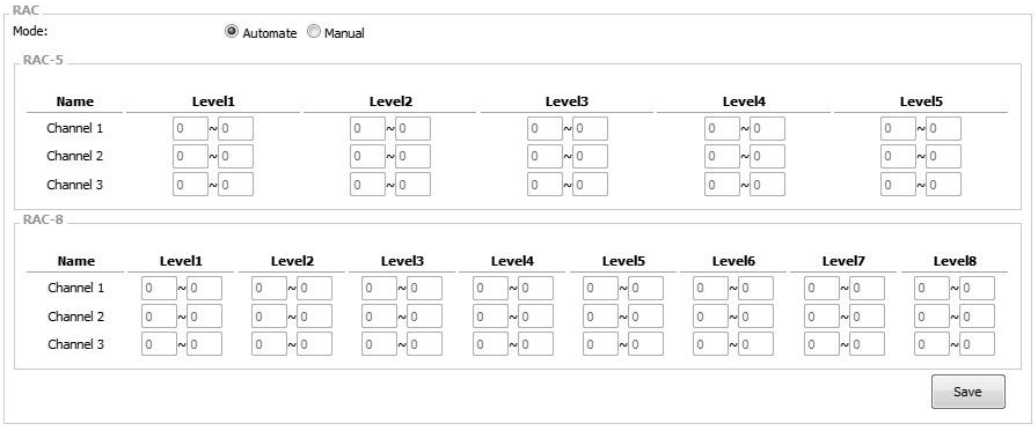
connected. The Control Input 2 "RAC-Channel Select" indicates the Control Input 2 is connected to the selection channel of RAC5/RAC8. And the Control Input 3 "RAC-Analog-Volume Control" indicates the Control Input 3 is connected to the volume channel of RAC5/RAC8.

- Logic: Display the minimum and maximum value (between 0~255), it is commonly used for a push button or a analog knob on RAC5/RAC8.


Logic

Name	Maximum	Minimum	Now
Channel 1	241	8	9
Channel 2	241	9	242
Channel 3	242	9	243
Channel 4	241	9	242
Channel 5	241	9	242
Channel 6	242	9	242
Channel 7	241	9	241
Channel 8	242	9	9

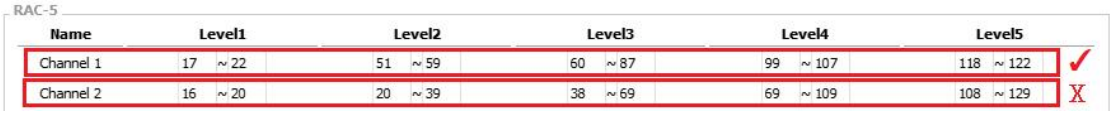
- RAC: The RAC5 and RAC8 are the remotes which feature the wall-mount volume display and source selection for Terracom system. This function indicates the range of each input channel of RAC5/ RAC8.



  - Mode: Users can define whether to auto detect or manually enter the level value of each channel of RAC5/RAC8.

If the level value are too close or overlap with other level value, please switch to Manual mode and set the value manually. To set the correct values, please see the example picture as below.

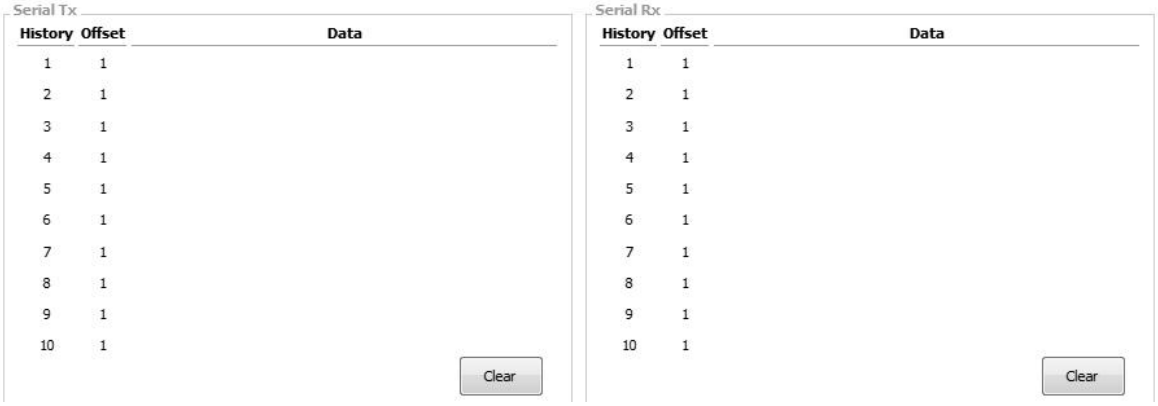
  - Channel 1: The Level1 (17~22) on Channel 1 does not overlap the Level2 (51~59), and so does other values on Channel 1.
  - Channel 2: The Level1 (16~20) on Channel 2 is overlapped the Level2 (20~39), and so does other values on Channel 2, therefore, please adjust the level values again.


RAC-5

Name	Level1	Level2	Level3	Level4	Level5	
Channel 1	17 ~ 22	51 ~ 59	60 ~ 87	99 ~ 107	118 ~ 122	✓
Channel 2	16 ~ 20	20 ~ 39	38 ~ 69	69 ~ 109	108 ~ 129	X

- How-to: Please refer to Calibrate the RAC and Push Button 99 chapter.

5.6.3 Serial Log



❖ History: Each section of history data (Serial TX and Serial RX) can be recorded with a max. log of 10. The order of item number listed upper among them indicates the newer data.

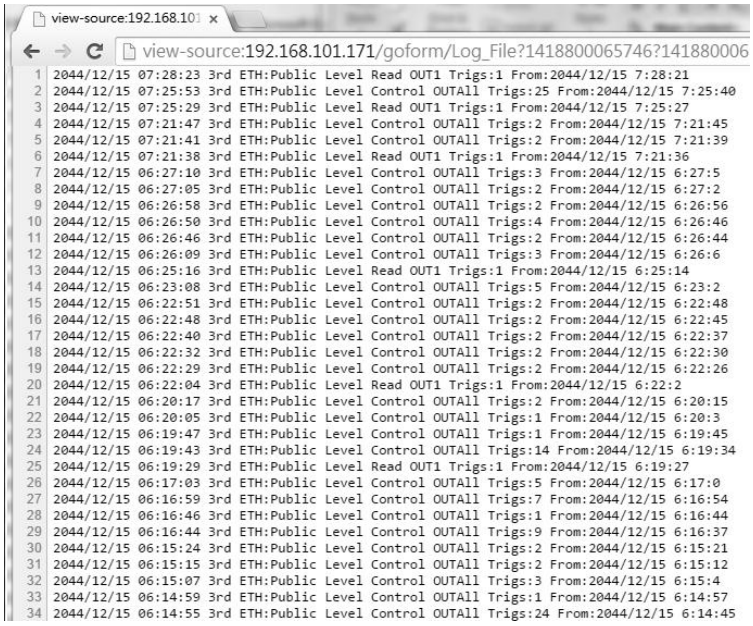
❖ Offset: Display the position of offset record of each recorded data.

❖ Data: Display the content of each recorded data.

❖ Clear: Clear all the Serial Tx/Serial Rx Port.

5.6.4 Log File

Click the Log File to open a new window displaying the "log content". The webpage can be saved to a single html file.



5.7 About

After log in the web interface successfully, the About page will be displayed as the start-up window.

5.8 Logout

Click [Logout] button, there will be a pop-up window for logout confirmation.

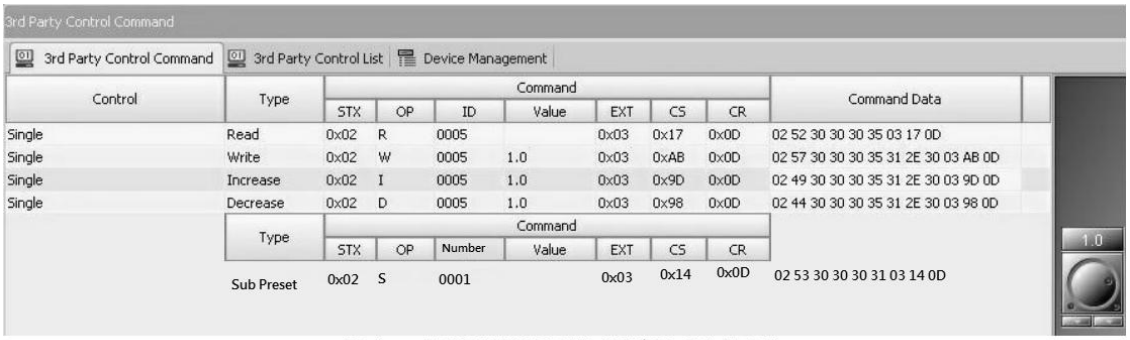
5.9 How-To

5.9.1 Send [Sub Prest] Command to PPM-IT5

Please create the commands on Ateis Studio software first, and set the settings via Terracom web interface.

❖ Ateis Studio Interface:

1. Copy the [Sub preset] command string data (Hex code) received by the target on Ateis Studio software. The string should be changed to ASCII code on Terracom web interface.
2. The [Sub preset] commands in [Picture 1] come from the internal command of Ateis processor, not from the external commands.



String: %02hWC0051%03h$02,07h%0dh

[Picture 1]

3. [Picture 2] indicates the different codes listed on the 3rd party command on Ateis Studio software which corresponds to the command string that can be read from the PPM-IT5.

Command						
STX	OP	ID	Value	EXT	CS	CR
%02h	W	C005	1	%03h	$02,07h	%0dh

=%02hWC0051%03h$02,07h%0dh

[Picture 2]

- 02: This is an initial code which is a fixed value and cannot be changed.
- WC0051: This number is created by Ateis Studio.
- %xxh: Convert xx into hexadecimal values.
- 0D: This is an end code which is fixed value and cannot be changed.
- $xx: This is the initial code which starts counting from "W".
- ,xxh: This is the end code which starts counting from the first string number.

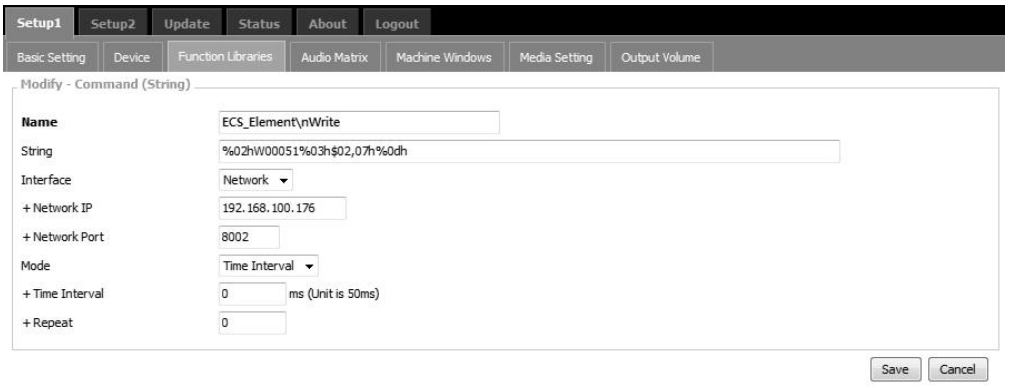
Normally, you will need to change the "WC0051" once.

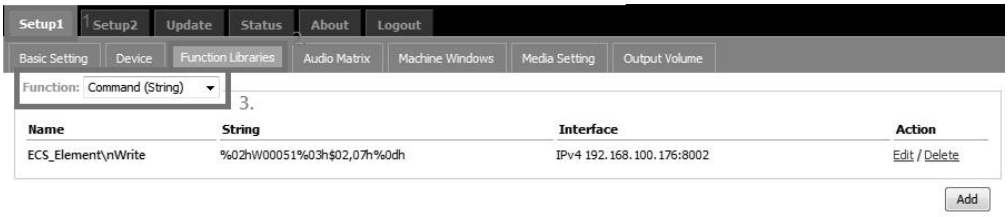
If the number "WC0051" adds up and changes to "WC0051x" for example, the following ,0xh needs to be added up, too.
Example: If the original string is %02hWC0051%03h$02,07h%0dh, users need to change the string to %02hWC00511%03h$02,08h%0dh.

❖ Terracom Web Interface:

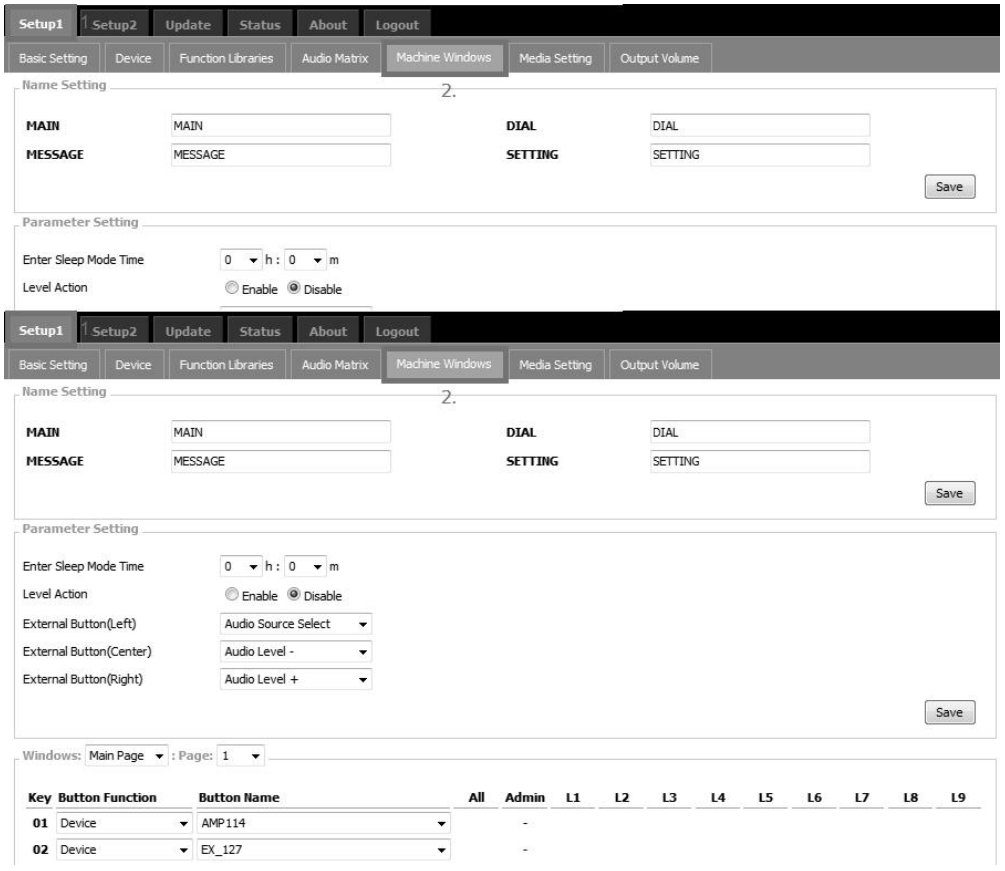
1. Create a new 3rd party commrmand on [Function Libraries]. Follow the steps from the pictures as below.

Remember to set the string as %02hWC0051%03h$02,07h%0dh, which Terracom can only received the ASCII code.

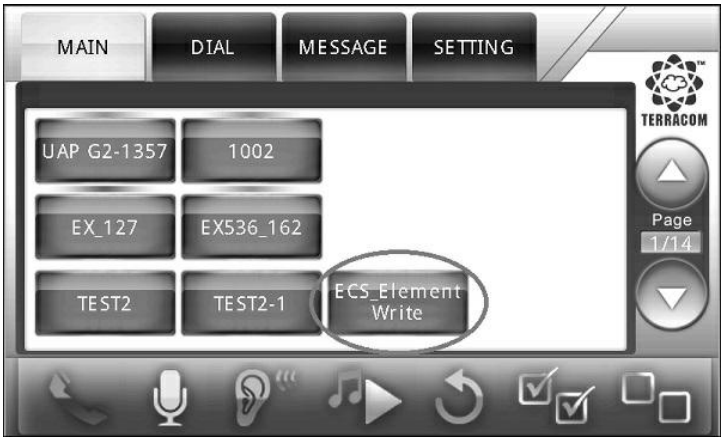




2. Go to [Machine Window] and select [Command String] on the drop box of [Button Function] and select the command you create on [Button Name]. See the picture below.

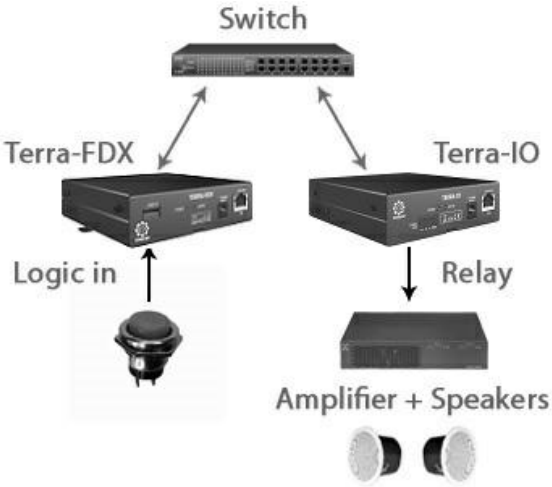


3. After that, the configuration will be uploaded into the PPM-IT5 device. See the picture below.



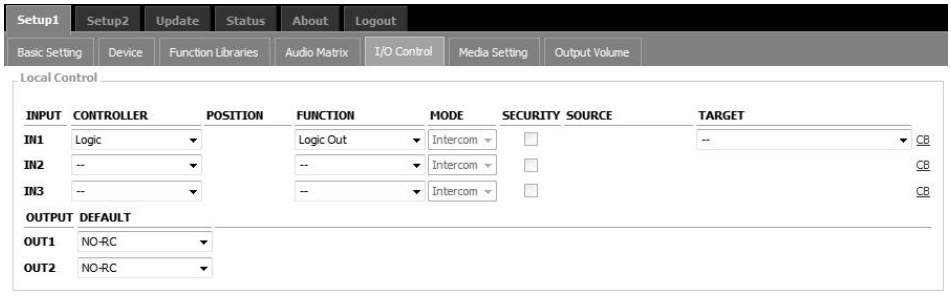
5.9.2 Use Logic Out to Activate Amplifier During Paging

Here is an example using a microphone which is connected to the TERRA-FDX to trigger the relay of TERRA-IO for waking up the power switch of the amplifier during paging.



1. First, connect a device such as power switch which allows the relay of TERRA-IO to control this power switch. Then connect a logic input (button) on TERRA-FDX for triggering the relay of [Logic Out] action.
2. Create a [Logic Out] action from Terracom web interface > Function Libraries > Logic Out. See the picture as below, here we name this [Logic Out] action as Power_On. After completed the setting, click [Save] button.

3. Go to [I/O Control] page, and complete the following settings as below.



- Input: Select the control input which the button is connected to, the IN1 means logic input channel 1.

- Controller: Select [Logic].
- Function: Select [Logic Out].
- Target: Select the [Logic Out] action you set, here we choose [Power_On].

4. Then click [Save] button to activate this action.
5. Now the [Logic Out] action will be activated when pressing the control input button.

5.9.3 Make Telephone Call

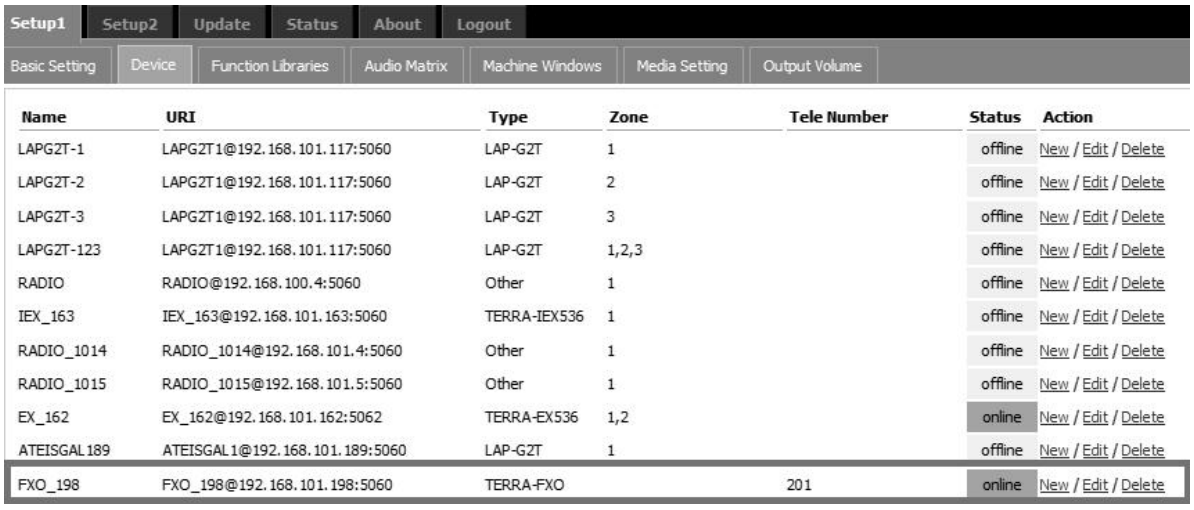
5.9.3.1 Using TERRA-FXO

❖ Add a TERRA-FXO with telephone card from [Setup1 > Device] as the picture below, then click [Add] button to set the telephone number on [Add Device] window.

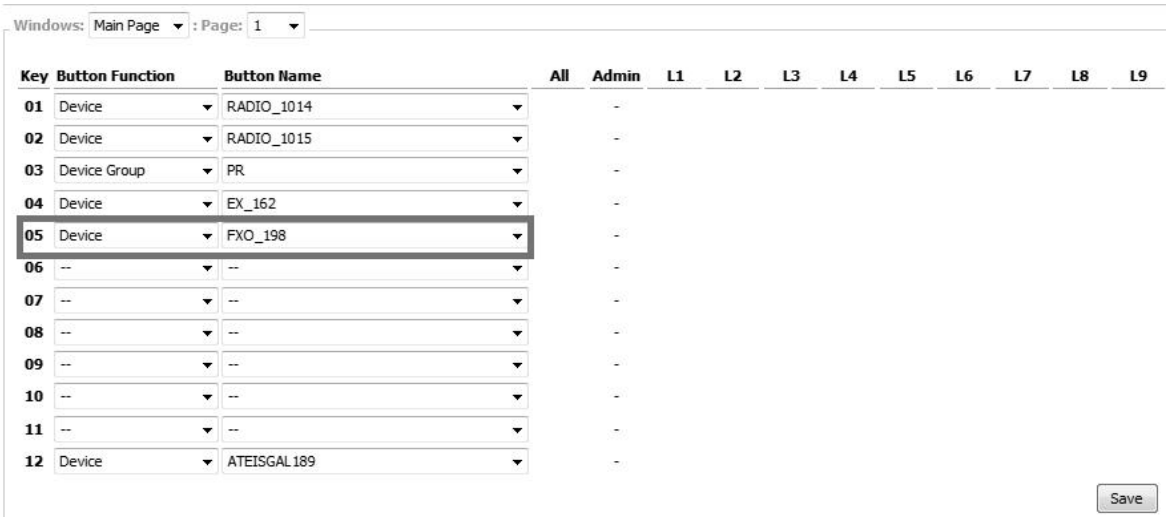
- Device Name: The name of this TERRA-FXO device.
- Telephone Number: Enter the telephone number which will be called.

5.9.3.2 Using PPM-IT5

❖ Use PPM-IT5 to call a telephone line by adding a TERRA-FXO on [Steup1 > Machine Window].



Name	URI	Type	Zone	Tele Number	Status	Action
LAPG2T-1	LAPG2T1@192.168.101.117:5060	LAP-G2T	1		offline	New / Edit / Delete
LAPG2T-2	LAPG2T1@192.168.101.117:5060	LAP-G2T	2		offline	New / Edit / Delete
LAPG2T-3	LAPG2T1@192.168.101.117:5060	LAP-G2T	3		offline	New / Edit / Delete
LAPG2T-123	LAPG2T1@192.168.101.117:5060	LAP-G2T	1,2,3		offline	New / Edit / Delete
RADIO	RADIO@192.168.100.4:5060	Other	1		offline	New / Edit / Delete
IEX_163	IEX_163@192.168.101.163:5060	TERRA-IEX536	1		offline	New / Edit / Delete
RADIO_1014	RADIO_1014@192.168.101.4:5060	Other	1		offline	New / Edit / Delete
RADIO_1015	RADIO_1015@192.168.101.5:5060	Other	1		offline	New / Edit / Delete
EX_162	EX_162@192.168.101.162:5062	TERRA-EX536	1,2		online	New / Edit / Delete
ATEISGAL189	ATEISGAL1@192.168.101.189:5060	LAP-G2T	1		offline	New / Edit / Delete
FXO_198	FXO_198@192.168.101.198:5060	TERRA-FXO		201	online	New / Edit / Delete

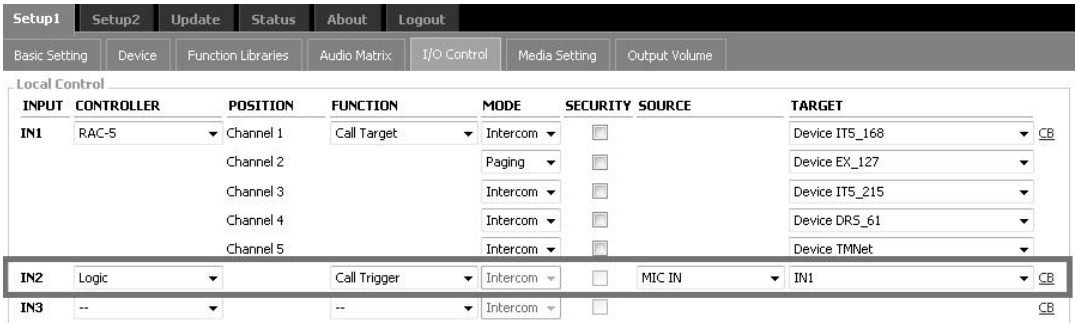


- Choose the target (Terracom device) on the [Button Name] grid of Machine Window.

5.9.3.3 Using TERRA-FDX

- By using a logic:

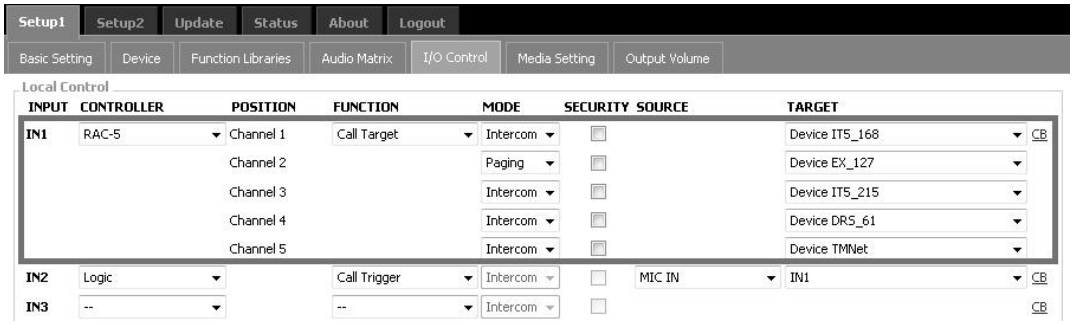
  After connecting a trigger device such as a "push button", you can perform the function with the setting listed below.



  - I/O Control: Select the input which the button is connected to, the IN1 means logic input channel 1.
  - Controller: Select Logic.
  - Function: Select Call Trigger.
  - Source: Select the source, MIC IN or LINE IN.
  - Target: Select the target, here we use "IN1".

- By using a RAC-5 or RAC-8:

  1. After connecting a RAC with a button, you can perform the function with the setting listed below.

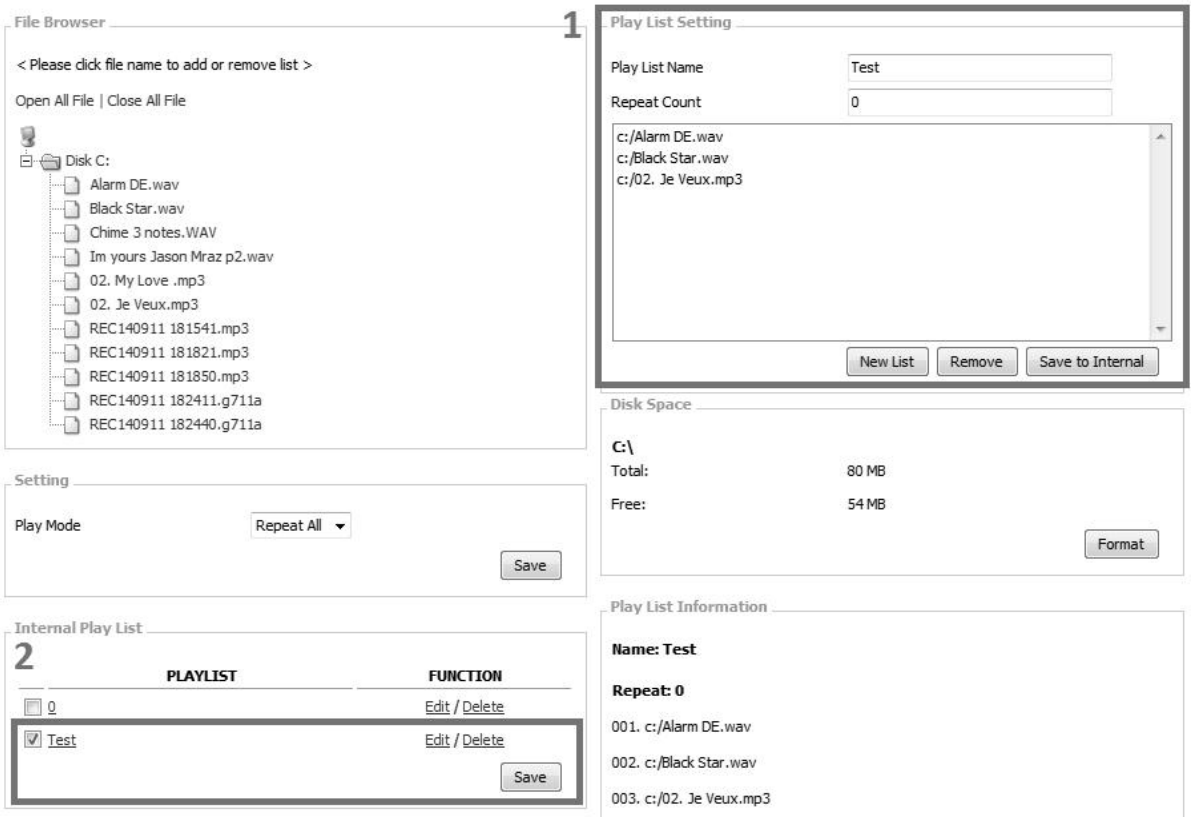


- I/O Control: Select the input which the RAC5/RAC8 is connected to, the IN1 means short 1-pin and G-pin.
- Controller: Select RAC5 or RAC8.
- Position: The channels of the RAC.
- Function: Select Call Target.
- Target: Select the target, you can set 5 or 8 different targets.

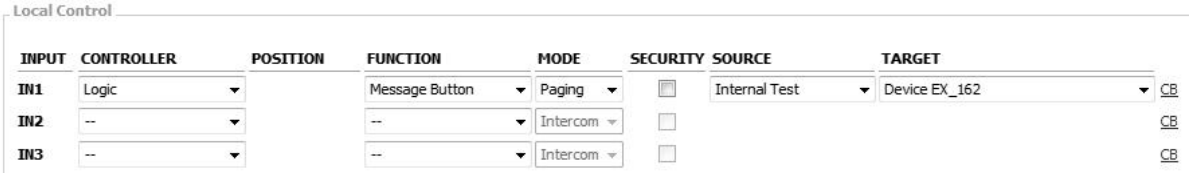
2. Now, set a button (as mentioned before) to trigger the RAC.
   - I/O Control: Select the input which the RAC5/RAC8 is connected to, the IN2 means short 2-pin and G-pin.
   - Controller: Select Logic.
   - Function: Select Call Trigger.
   - Source: Select the source, MIC IN or LINE IN.
   - Target: Select the target, here we use "IN1" where the RAC is connected to.
3. Easily switch the knob to the target you want and press the button to perform a telephone call.

5.9.4 Message Paging

1. Create a new audio list with the selected audio files on [Play List Setting], and choose the folder on [Internal Play List] as the input source.

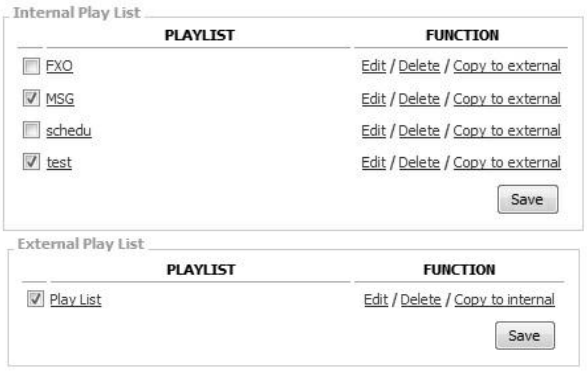


2. Go to [Setup1 > I/O Control] and set [Paging] as the Mode, then choose the internal folder on [Source] as the input Source.

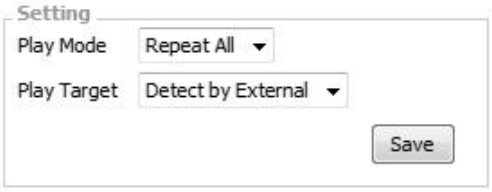


5.9.5 Play Music/Message from Interna/External Play List

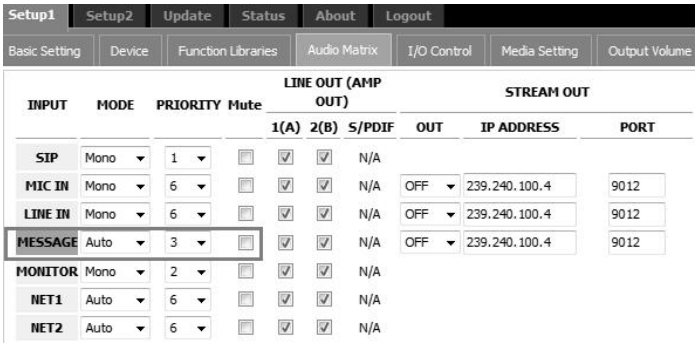
1. Tick the checkbox of the playlist you wish to be played.



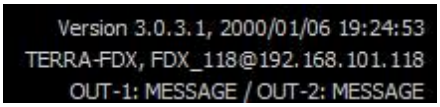
2. Set the Play Mode (Normal/Repeat All/ Random) and Play Target (By internal source/external source/external source as priority).



3. Go to [Audio Matrix] page, and set the priority of MESSAGE Input higher than MIC IN, LINE IN, MONITOR, NET1 and NET2.
4. Then click [Save] button.



5. If the music/message playlist has been played successfully, the information of 2 CH Line Out will display as MESSAGE on the top right corner.



5.9.6 Calibrate the RAC and Push Button

❖ Calibrate RAC

1. Connect the RAC-5/RAC-8 to your Terracom device, make sure which pin is short with GND-pin. For example here we use IN1 which means logic input channel 1.
2. Click the [CB Control Calibrate] button at [I/O Control] page.

3. Switch the knob of RAC-5/RAC-8 to the channel 1 and click [Calibrate] button for receiving the [Minimum] data.
4. Switch the knob of RAC to the channel 5/channel 8 and click [Calibrate] button again for receiving the [Maximum] data.
5. Then switch each knob of RAC-5/RAC-8 again for receiving the calibration (from CH1~5 or from CH1~8). The data will automatically be recorded.
6. After all calibration (from CH1~5 or from CH1~8) is done, go back to "Status > Control Calibration" page and check if the values are correct. If they're too close or overlap with other level value, please switch to Manual mode and set the level value manually. Please refer to Control Calibrate 88 to manually set the correct level values.

❖ Calibrate the Push Button (Logic Input)

1. Connect the push button to your Terracom device, make sure which pin is short with GND-pin. For example here, we use IN1 (short G-pin and 1-pin).
2. Click [CB Calibrate] at the I/O Control page, a pop-up window will appear as the picture below.

3. Open the drop down list, select "Minimum", press the button and click [Calibrate].
4. Open the drop down list, select "Maximum", release the button and click [Calibrate].
5. After calibration (down and up button) is done, go back to "Status > Control Calibration" page and check if the values are correct. If they're too close or overlap with other level value, please switch to Manual mode and set the level value manually. Please refer to Control Calibrate 88 to manually set the correct level values.

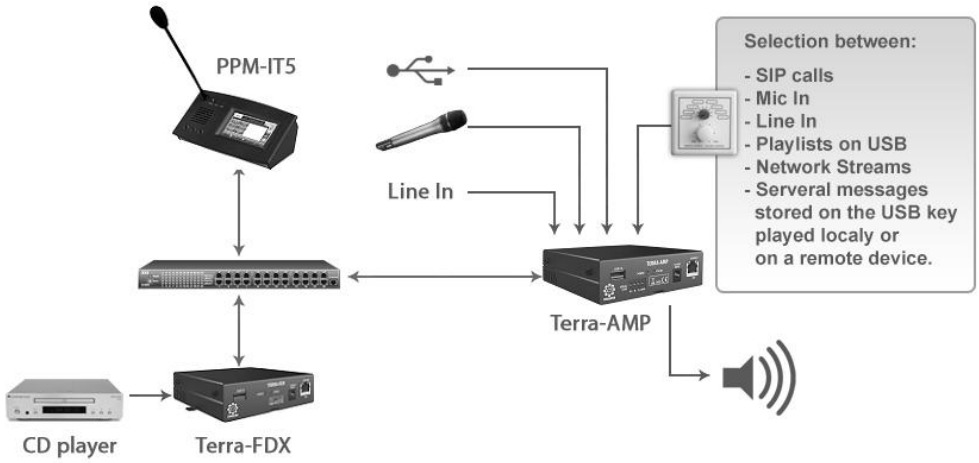
❖ Calibrate an Analog Knob

1. The first 2 steps are the same as calibrating a push button.
2. Open the drop down list, select "Maximum", turn up the knob to max. volume and click [Calibrate].
3. Open the drop down list, select "Minimum", turn down the knob to min. volume and click [Calibrate].
4. After the calibration is done, go back to "Status > Control Calibration" page and check if the values are in the correct range. If they're too close or overlap with other level value, please switch to Manual mode and set the level value manually. Please refer to Control Calibrate 88 to manually set the correct level values.

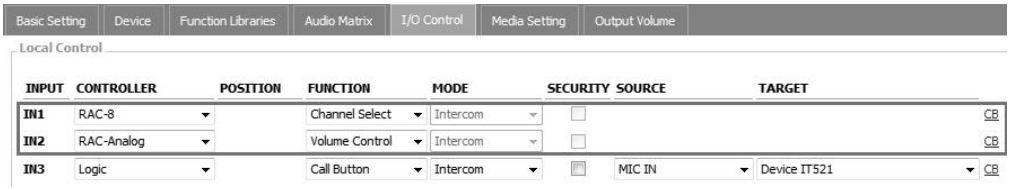
5.9.6.1 Hotel Application

❖ How to use the RAC for music/source selection and how to make an announcement.

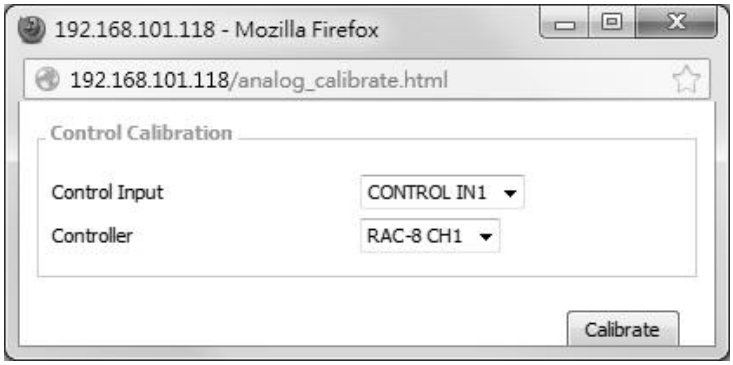
From the picture below, the TERRA-AMP is located in each hotel room which is connected to a wall-mounted RAC for source selection, and makes the announcement using the PPM-IT5 console. After the wiring connection between the Terracom devices and RAC are finished, go to the Terracom web interface.



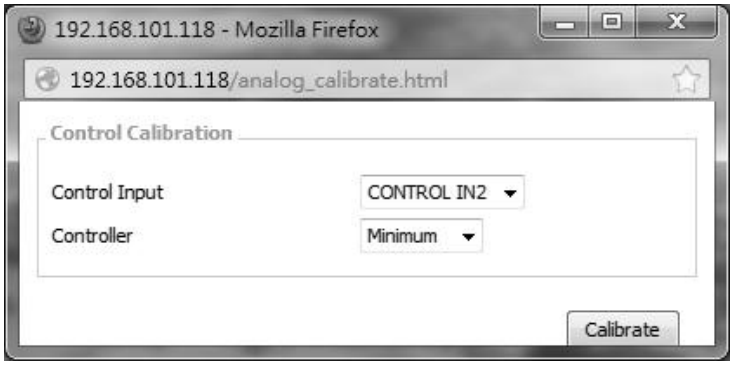
1. Go to the web interface of TERRA-AMP to set the RAC and calibrate both channel selectors and the analog knob for volume control.
   - Go to "Setup1 > I/O Control" and set the controller to the correct control input. Here we assign the Channel Select to IN1 and Volume Control to IN2.



   - Click the "CB" and a control input's calibration window will pop-up.
     - How to calibrate a channel selection on RAC is mentioned in the previous chapter, see Calibrate the RAC and Push Button 99 chapter.



     - Similar to calibrate a button, an analog knob has the Min/Max value. Turn up to the max volume on RAC and click [Calibrate] button and turn down to the min volume on RAC and click [Calibrate] button. After all calibration is done, check the values at "Status > Control Calibration" to confirm the consoles are working.



2. The next part is to assign the input source priorities to RAC (except the SIP priority).

   - Go to the Audio Matrix page and set as the picture below, the number of channel is depending on the steps the RAC unit.
   - Open the drop-down list of "Select" under the "Control Options" and choose IN1 where the RAC is connected to. Next, change the volume from Fix to IN2 as well.

   Now the priority of all the audio source and its volume are assigned to the RAC control as shown in the picture below.

INPUT	MODE	PRIORITY	Mute	LINE OUT (AMP OUT) 1(A)	2(B)	S/PDIF	STREAM OUT OUT	IP ADDRESS	PORT	CONTROL OPTIONS SELECT		INPUT VOLUME		BUFFER
SIP	Mono	1	☐	☑	☑	N/A						Fix	36	RT
MIC IN	Mono	6	☐	☑	☑	N/A	OFF	239.240.100.1	9012	IN1	1	IN2	32	
LINE IN	Mono	6	☑	☑	☑	N/A	OFF	239.240.100.1	9012	IN1	2	IN2	32	
MESSAGE	Auto	6	☑	☑	☑	N/A	OFF	239.240.100.1	9012	IN1	3	IN2	32	
MONITOR	Mono	6	☐	☑	☑	N/A						IN2	32	RT
NET1	Auto	6	☑	☑	☑	N/A						IN2	32	RT
NET2	Auto	6	☐	☑	☑	N/A						IN2	32	RT

N/W IN	MODE	SHOUTCAST/ICECAST URL	STREAM MULTICAST IGMP IP	PORT	NET1		NET2	
SOURCE 1	SHOUTcast/icecast	http://192.168.100.1:9988			IN1	4	Fix	--
SOURCE 2	Stream Multicast		239.240.100.1	9012	IN1	5	Fix	--
SOURCE 3	Stream Multicast		239.240.100.1	9012	IN1	6	Fix	--
SOURCE 4	Stream Multicast		239.240.100.1	9012	IN1	7	Fix	--
SOURCE 5	Stream Multicast		239.240.100.1	9012	IN1	8	Fix	--
SOURCE 6	Stream Multicast		239.240.100.1	9012	IN1	1	Fix	--
SOURCE 7	Stream Multicast		239.240.100.1	9012	IN1	1	Fix	--
SOURCE 8	Stream Multicast		239.240.100.1	9012	IN1	1	Fix	--

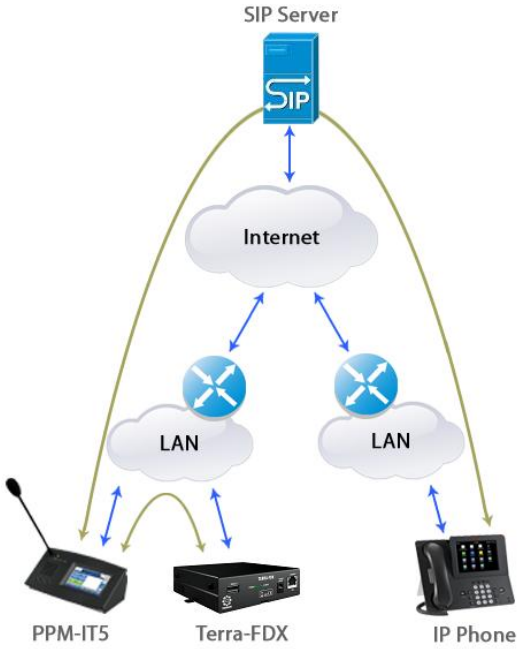
* Port 8000~9000 has been used by system, **DO NOT** use these ports on your design.

 Always set the volume of SIP in "FIX" and is sufficient for the safety requirements.

6 Tools

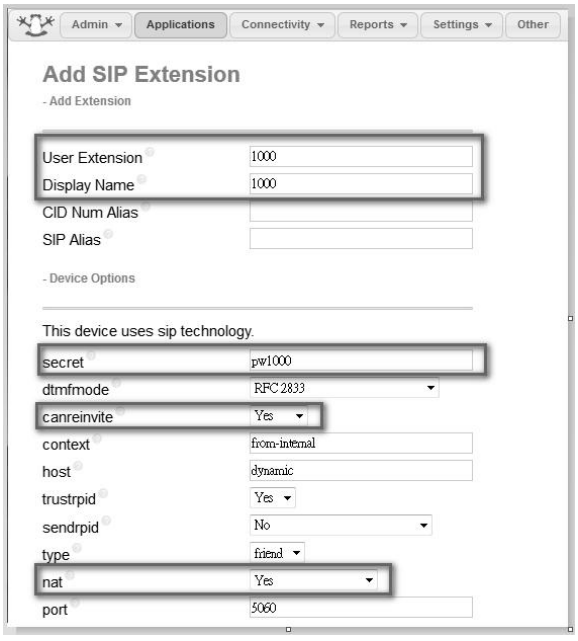
6.1 SIP Server (Intercom)

Use PPM-IT5 to call an IP phone over internet by using a SIP Server. The following guide how to setup the Server, IP phone and PPM-IT5.



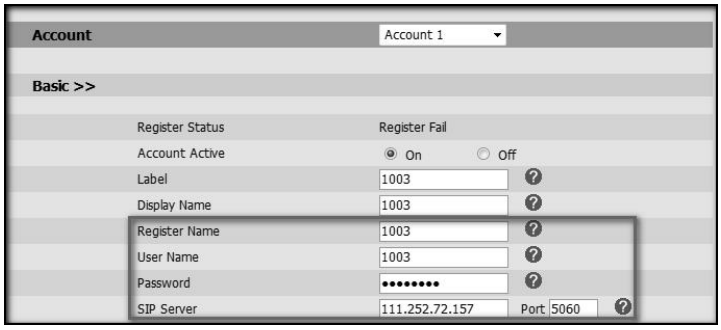
1. The SIP server will redirect the RTP stream directly, here we use the Asterisk VOIP server.

- User Extension: The user name is required in PPM-IT5's web setting page.
- Display Name: Set the display name.
- Secret: Set the password which is required in PPM-IT5's setting page.
- Canreinvite: Re-Invite the policy for this device.
- nat: Set "Yes" for both internal and external devices. If the device will always as an internal device, select "No".



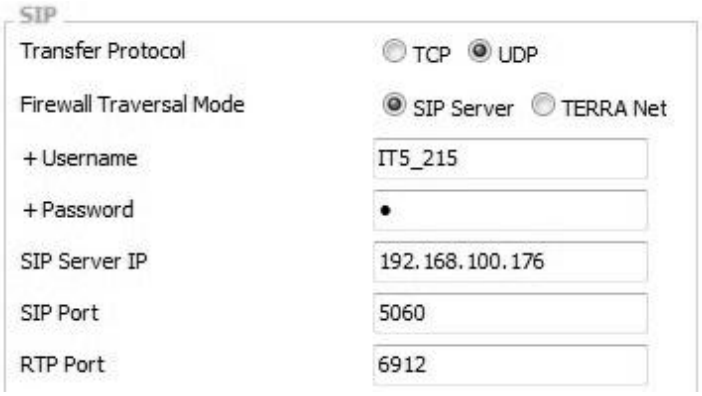
2. Set the IP phone, here we use the Yealink IP Phone.

- Register Name: The extension number you want to associate with this IP phone will be required in PPM-IT5's web setting page later.
- User Name/Password: Set the registered user ID and password of the specific Terracom device.
- SIP Server: Set the IP address and port of SIP Sever. In this example, it's the Asterisk VOIP server.

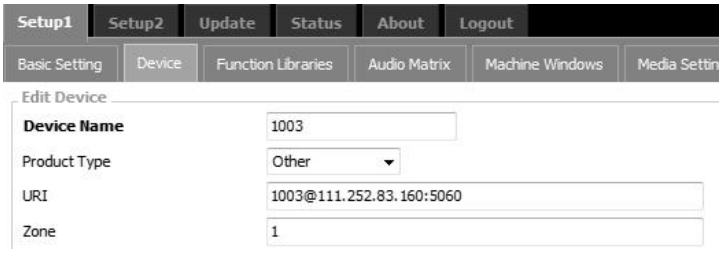


3. Go to the PPM-IT5 web interface to assign the SIP Server at "Setup1 > Basic Setting" and choose "Other" on Product Type at "Setup1 > Device > Edit".

- Set the SIP Server:
  - Firewall traversal Mode: Choose SIP Server.
  - Username/Password: Set the registered user ID and password of the specific Terracom device.
  - SIP Server IP: Set the IP address of SIP Sever.
  - SIP Port: Network port for SIP protocol, set 5060 by default.
  - RTP Port: Network port for RTP protocol, set 6912 by default.



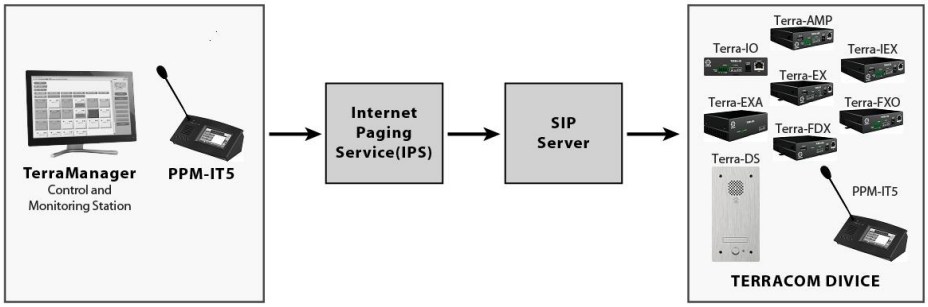
- Add the device into Device:
  - Name: The extension number of IP phone.
  - Product: Choose "Other" and enter the product type, here we use "IP-Phone".
  - URI: The URI of the IP phone.
  - Zone: Choose 1.



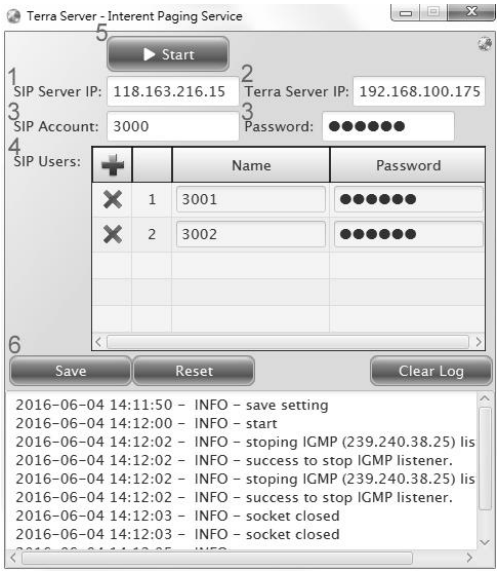
4. Go to the Main Window and add a Device button to get the function going with a click of mouse.

6.2 Internet Paging Server (IPS)

Support to paging to Terracom device via TerraServer-Internet Paging Server (IPS) software.



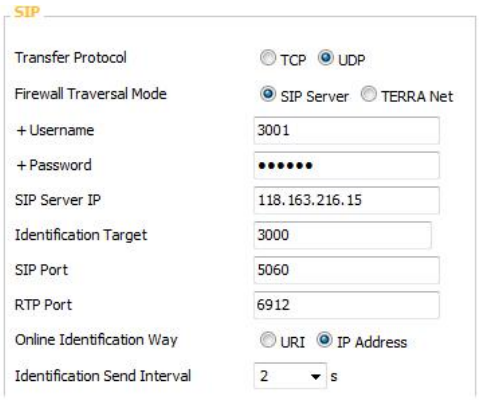
❖ Control Window



1. SIP Server IP: Set the IP address of SIP Sever.
2. TerraServer IP: Set the IP address of Internet Paging Server (IPS).
3. SIP Account/SIP Password: Set the SIP account and password used for IPS.
4. SIP Users: Set the registered user ID and password of your Terracom device for paging.

   Note: Users need to create the [SIP Account] and [SIP Users] from SIP Server first.
5. Start: Click to activate the IPS software.
6. Save/Reset: Click to save/reset the settings. Please note once the Reset button will clear all the data.

❖ TERRACOM Web Browser



Go to Setup1 > Basic Setting >SIP 44 on TERRACOM web browser and set the IPS settings.

- Firewall Traversal Mode: Choose [SIP Server] option.
  - Username/Password: Set the registered user ID and password of the specific Terracom device for paging.
  - SIP Server IP: Set the IP address of SIP Sever.
  - Identification Target: Set the SIP Account used for IPS.
- SIP Port: Network port for SIP protocol, set 5060 by default.
- RTP Port: Network port for RTP protocol, set 6912 by default.
- Online Identification Way: Choose [URI] option as the identification way to know whether the Terracom device is online/offline.
- Identification Send Interval: The interval of sending the IPS signal.

❖ Using the TerraManager/PPM-IT5 to paging via Internet Paging Server (IPS) software and SIP server:

Source	IPS	SIP Server	Local Net Paging	Local Net Intercom	VPN Paging	VPN Intercom	Internet Paging	Internet Intercom
TerraManager	No	No	V	V	X	X	X	X
TerraManager	Yes	No	V	V	V	X	X	X
TerraManager	No	Yes	V	V	X	X	X	X
TerraManager	Yes	Yes	V	V	V	X	V	X
PPM-IT5	No	No	V	V	X	X	X	X
PPM-IT5	Yes	No	V	V	V	V	X	X
PPM-IT5	No	Yes	V	V	X	V	X	V
PPM-IT5	Yes	Yes	V	V	V	V	V	V

- V: TerraManager/PPM-IT5 supported
- X: TerraManager/PPM-IT5 unsupported

6.3 Icecast

This chapter shows how to use Icecast server, Edcast and Winamp to stream audio to Terracom.

❖ Program Installation

- Icecast Server:

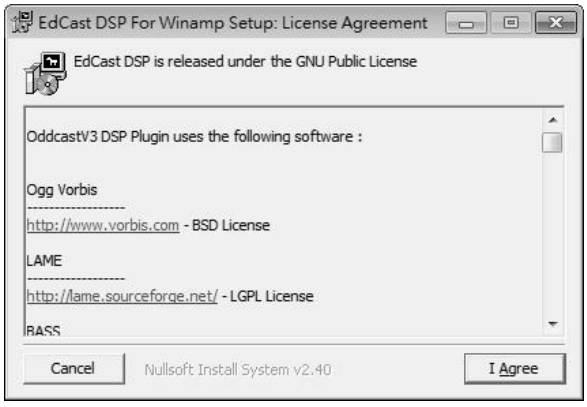
  You can find the newest version on Icecast website. Here we use Icecast 2 for Windows (32bit) and follow the steps of setup wizard to install.

- Winamp Media Player:

  You can find the newest version on Winamp website, follow the steps to install.

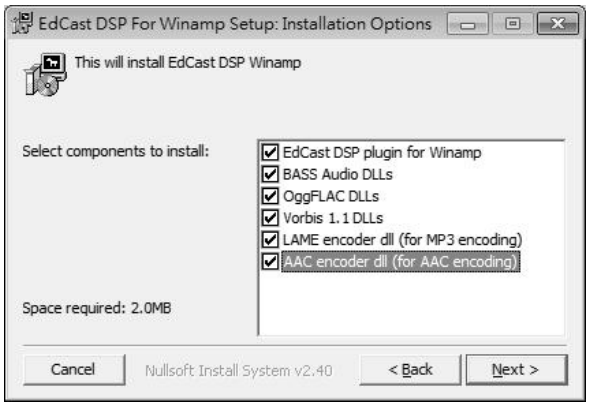
- EdCast:

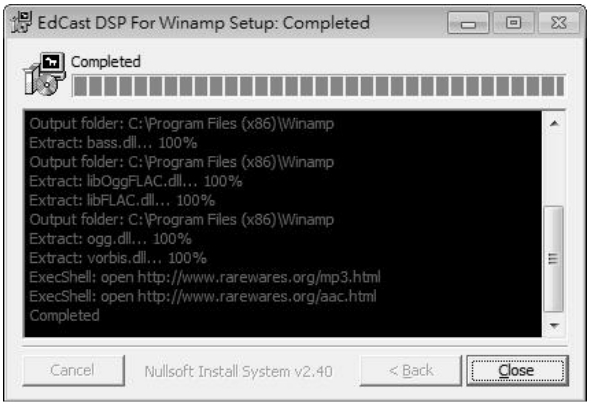
  EdCast supports 48k sample rate and it's exactly what we need for Terracom. Here we use EdCast DSP for Winamp.



  If you want to stream MP3, tick the

checkbox of LAME encoder dll (for MP3 recording).





❖Setting the Icecast Server:

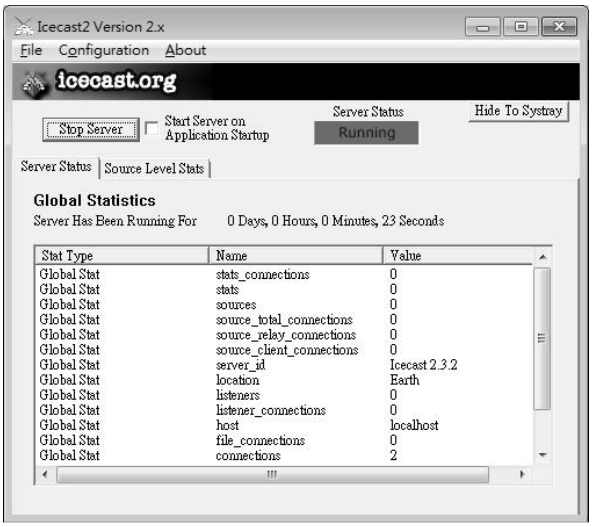
After installing the Icecast, double click its icon to open the server.

To set the port and password, click the "Configuration > Edit Configuration" to open a text file.

- Find the line <port>9866</port> and choose a port which should be an even number and NOT in the range 8000~9000.
- Find the text between the section <authentication>ID and password</ authentication>, this will be required in EdCast's setting fields.

Once the setting is done, click the [Start Server] button, the server will start running as shown in the picture on the right.

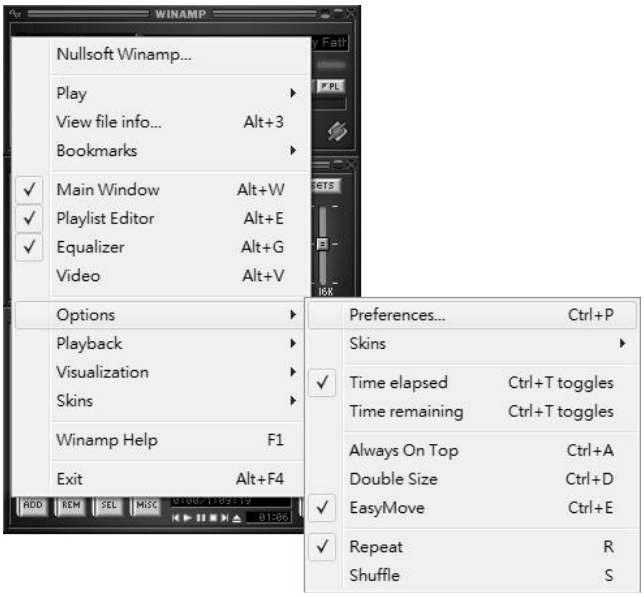
- You can click the [Hide To Systray] button to hide the window.



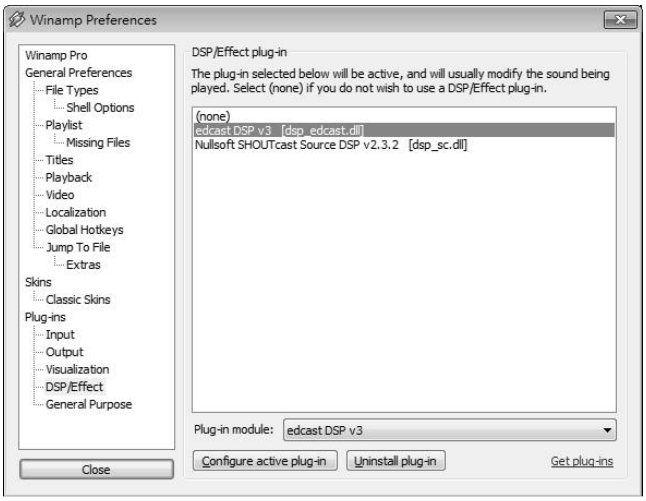
❖ Set Winamp Media Player and EdCast plug-in:

- Assign the DSP plug-in of Winamp media player and set the parameters of EdCast.

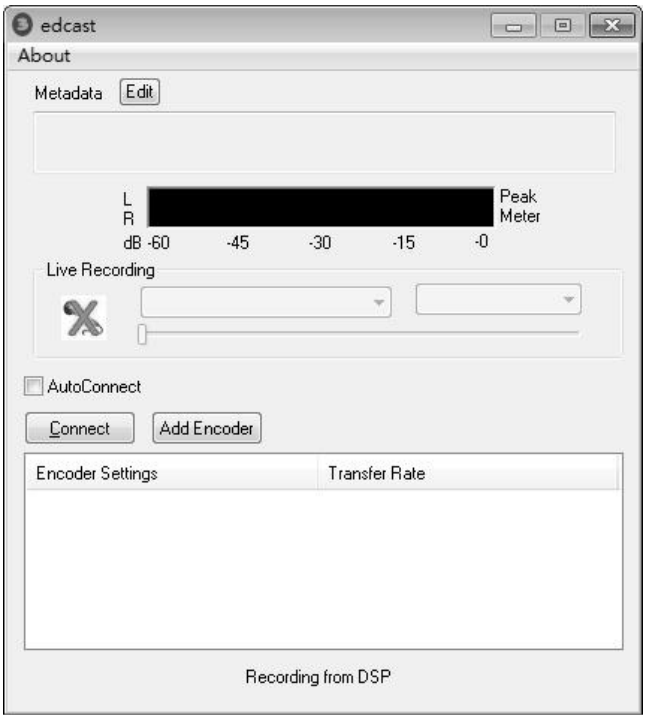
- Right click on the Winamp panel and choose "Options > Preferences"



❖Once the Winamp Preference window opens, choose the item "edcast DSP v3 [dsp_edcast.dll]" in the "DSP/Effect" under the "Plug-ins" section.



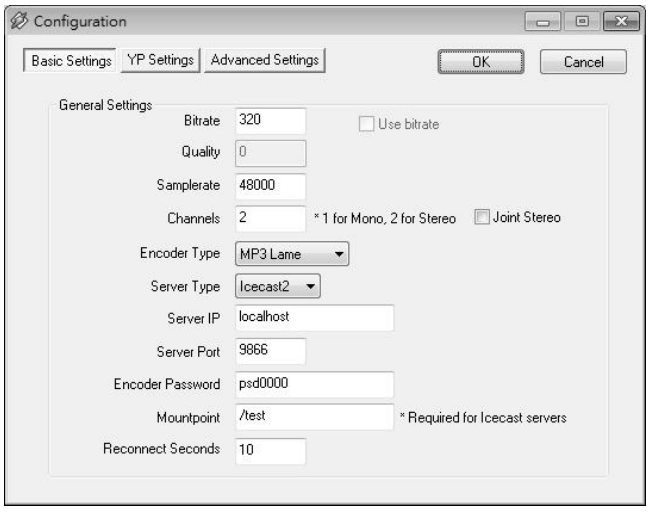
- Now double click the item to open the EdCast's setting window, it appears as shown in the picture on the right.

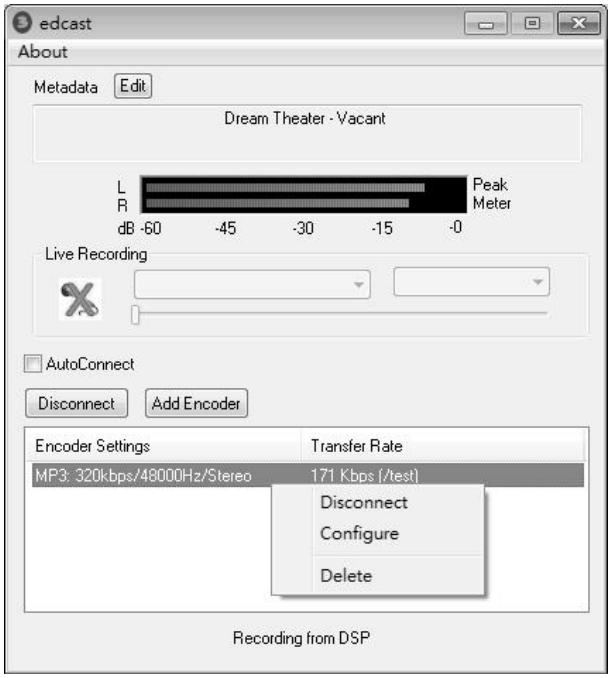


- Click the [Add Encoder] button and set the encoder, only the Basic Setting matters the stream.
  - Samplerate: The sample rate must be 48k or the Terracom would not play the files.
  - Encoder type: Choose MP3. Here we use the MP3 Lame encoder found on a website.

Copy the file into the Winamp program directory.

  - Server IP: Use the default value "localhost" if you're running the server on your PC.
  - Server Port: Set the port in the Icecast server's configuration window.
  - Encoder password: Set the password in the Icecast server's configuration window.
  - Mountpoint: This item is required for icecast, so we assign a "/test" for it.
- Click the [Connect] button to start the encoder, the stream will start after few seconds.
- You can right-click to disconnect, configure or delete the encoder as shown in the picture on the right.

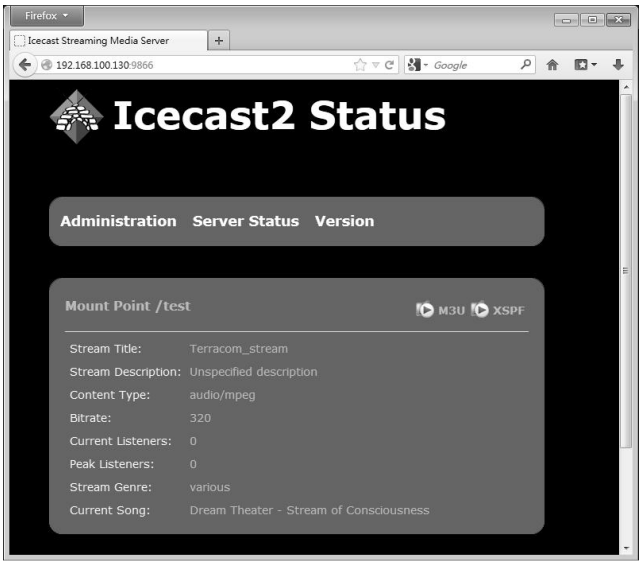




❖ Icecast Web Interface:

You can direct your browser to http://192.168.xxx.xxx:9866/ (replace 192.168.xxx.xxx with your own IP address when it's localhost) and browse through the web interface.

The Current Song showing the dynamic changes with your Winamp player.



❖ Receiving stream from Icecast Server:

Go to Terracom's "Auido Matrix" webpage and set as shown in the picture below, remember to add the "Mountpoint" which is set in the EdCast plug-in setting window.

In the "Setup > Basic Setting" page as mentioned before, you can set the "Stream Buffer" time.

N/W IN	MODE	SHOUTCAST/ICECAST URL	STREAM MULTICAST IGMP IP	PORT		
SOURCE 1	SHOUTcast/icecast	http://192.168.100.130:9866/test			IN1	4
SOURCE 2	SHOUTcast/icecast	http://192.168.100.61:9878/jms			IN1	5
SOURCE 3	Stream Multicast		239.240.100.2	4444	IN1	6
SOURCE 4	Stream Multicast		239.240.100.3	4444	IN1	7

7 Maintenance and Troubleshooting

This chapter will help you diagnose and troubleshoot common problems. If none of these solutions work, please contact your Terracom dealer.

❖ Update Fails

1. Proceed the Update action again.
2. Remove all the settings (compatible problem).
   - Function Libraries.
   - Control Input.
   - Recording.
3. Enable the "Factory Setting (CIN2)" at the "Basic Setting > SIP" page and perform the restoration.
   - Reverse your configuration.
   - If the IP address is lost, try the factory IP address: 192.168.102.1 to open the web interface.

❖ Can't Access the USB

1. Make sure the file system on the USB is FAT32.
2. If the USB driver has not been safely removed, there might be a file with .db-journal extension created. Delete that file and insert the USB key to the Terracom device again.

8 Technical Data

8.1 TERRA-EX

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	2W	RJ45
24VDC transformer			DC Jack

❖ Audio Characteristics-Line Out

- EIN @ gain 0 dBu = -83 dBrA
- THD+R (20Hz~20kHz)@ gain 0dBu , input 0 dBu = 0.09%
- FR(20Hz ~ 20kHz)@ gain 0dBu , input 0 dBu = 1 dBu
- Max Line out level @ gain 0dub ,input 0 dbu = 4.9dBu (1.38V)

❖ Logic Input

Item	Condition	Min.	Typ.	Max.
Logical Input	Low Active	-	-	1VDC
	High Active	4VDC	-	

❖ Audio Characteristics

Item	Condition	Min.	Typ.	Max.	Comment
Output Level (Headphone out)	20Hz ~ 20kHz	-	-	+5dBu	Electrically Balanced
Output Level (Audio Line out)	20Hz ~ 20kHz	-	-	+5dBu	Electrically Balanced
Input Impedance (input mix attenuation = 0 dB)	20Hz ~ 20kHz	-	20k Ohm	-	Electrically Balanced
Output Impedance	20Hz ~ 20kHz	-	50 Ohm	-	Electrically Balanced
Resolution	-	-	16Bit		-
Sensitivity	-	-59dBu	-	0dBu	-
Sampling Rate	-	-	48kHz	-	-
EIN	20Hz ~ 20kHz	-	<-84dBu	-	-
T.H.D	20Hz~20kHz, @ gain 0dBu	-	-	<0.5% <0.02%	<0.5% @<20~20kHz <0.02%@ 1kHz

❖ Mechanical & Environmental

Dimensions (W x L x H):	110mm x 104mm x 32mm
Weight:	0.4kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

8.2 TERRA-EXA

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
24VDC transformer	>19VDC	48W	DC Jack

- Max AMP OUT RMS @ gain 29 dBu, input -6 dbu, 8Ω-load= 15W (11.1Vrms)
- Max AMP OUT @ gain 29 dBu, input -4.7 dbu, 8Ω-load= 20W (12.8Vrms)

❖ Audio Characteristics-AMP Out

- EIN @ gain 29 dBu, 8Ω-load = -81 dBrA
- THD+R (20Hz~20kHz) @ gain 29dBu, input -7.5 dBu, 8Ω-load, AMP OUT is 10W < 1%
- FR (20Hz ~ 20kHz) @ gain 29 dBu, input -7.5 dBu, 8Ω-load, AMP OUT is 10W: +/- 1dBu

❖ Logic Input

Item	Condition	Min.	Typ.	Max.
Logical Input	Low Active	-	-	1VDC
	High Active	4VDC	-	

❖ Audio Characteristics

Item	Condition	Min.	Typ.	Max.	Comment
Resolution	-	-	16Bit	-	-
Sampling Rate	-	-	48kHz	-	-
EIN (Input Noise)	20Hz ~ 20kHz	-	<-80dBrA	-	-
T.H.D	20Hz~20kHz,@ 7.5W	-	-	<1%	Half-power@1kHz 20~20kHz
	20Hz~20kHz, @15W	-	-	<1%	Full-power@1kHz 20~20kHz
Frequency Response	20Hz~20kHz, @7.5W	>-3dBu	-	< +3 dBu	Half-power@1kHz 20~20kHz
	20Hz~20kHz, @15W	>-3dBu	-	< +3 dBu	Full-power @1kHz 20~20kHz

❖ Mechanical & Environmental

Dimensions (W x L x H):	102mm x 110mm x 32mm
Weight:	0.45kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

❖ Support paging by using ATEÏS IDA8, ECS, LAP G2T, UAP G2 processors.

8.3 TERRA-IEX

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	3.12W	RJ45
24VDC transformer			DC Jack

❖ Audio Characteristics

Item	LINE IN To Line out	LINE IN To SPDIF out	LINE IN To headphone	SPDIF IN To headphone	SPDIF IN To LINE Out
EIN @ gain 0 dBu	-83 dBra	-83 dBra	-83 dBra	-83 dBra	-83 dBra
THD+R (20Hz~20KHz)@ gain 0dBu input 0 dBu	0.09%	0.23%	0.10%	0.10%	0.10%
FR(20Hz ~ 20KHz) @ gain 0dBu input 0 dBu	1 dBu	-	1.6 dBu	0.3 dBu	1.3 dBu
FR(20Hz ~ 20KHz) @ gain 20dBu input -20 dBu	-	1 dBu	-	-	-

- Max Line in input level @ gain 0 dBu = 4.9 dBu
- Max Line out level@ gain 0dub ,input 0 dBu = 4.9dBu (1.38V)

❖ Logic Input

Item	Condition	Min.	Typ.	Max.
Logical Input	Low Active	-	-	1VDC
	High Active	4VDC	-	

❖ Audio Characteristics

Item	Condition	Min.	Typ.	Max.	Comment
Sampling Rate	-	-	48kHz	-	-
Serial Clock Frequency	20Hz ~ 20kHz	-	3.08Hz	-	-

❖ Memory:

Type	Memory size	Type	TOTAL Memory size
SDRAM	64M Byte	-	64M Byte
FLASH	128M Byte	-	128M Byte
SPI flash	4M BIT	-	4M Bit

❖ Mechanical & Environmental

Dimensions (W x L x H):	110mm x 104mm x 32mm
Weight:	0.4kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

❖ Support paging by using ATEÏS IDA8, ECS, LAP G2T, UAP G2 processors.

8.4 TERRA-AMP

❖ Electrical:

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	5.7W	RJ45
24VDC transformer		28.8W (max: 30W)	DC Jack

❖ Audio Characteristics

- Audio inputs: maximum level + 5 dB, bandwidth 20 Hz - 20 kHz
- Audio outputs: maximum level + 5 dB, bandwidth 20 Hz - 20 kHz

❖ Logic Input

Item	Condition	Min.	Typ.	Max.
Logical Input	Low Active	-	-	1VDC
	High Active	4VDC	-	

❖ Mechanical & Environmental

Dimensions (W x L x H):	110mm x 104mm x 32mm
Weight:	0.44kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

❖ Support paging by using ATEÏS IDA8, ECS, LAP G2T, UAP G2 processors.

8.5 TERRA-FDX

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	2.66	RJ45
24VDC transformer		2.64 W	DC Jack

❖ Audio Characteristics

- EIN @ gain 0 dBu = -83 dBrA
- THD+R (20Hz~20kHz)@ gain 0dBu, input 0 dBu < 0.1%
- FR(20Hz ~ 20kHz)@ gain 0dBu, input 0 dBu: +/- 1 dBu
- Audio inputs: maximum level + 5 dB, bandwidth 20 Hz - 20 kHz
- Audio outputs: maximum level + 5 dB, bandwidth 20 Hz - 20 kHz
- Max Line in input level @ gain 0 dbu = 4.6 dBu
- Max Line out level@ gain 0dub ,input 0 dBu = 4.6dBu (1.31Vrms)

❖ Logic Input

Item	Condition	Min.	Typ.	Max.
Logical Input	Low Active	-	-	1VDC
	High Active	4VDC	-	

❖ Mechanical & Environmental

Dimensions (W x L x H):	110mm x 104mm x 32mm
Weight:	0.4kg
Colour:	RAL7016

Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

❖ Support paging by using ATEÏS IDA8, ECS, LAP G2T, UAP G2 processors.

8.6 TERRA-DS

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	3.12 W	RJ45
24VDC transformer			DC Jack

❖ Audio Characteristics

Item	Condition	Min.	Typ.	Max.
EIN	150Ohm input	-	-68 dBu	-
THD+R	20Hz~20kHz, 0dBu input	-	0.05%	1.00%
Frequency Response	20Hz ~ 20kHz, 0dBu input	-0.5 dBu	-	2.5dBu

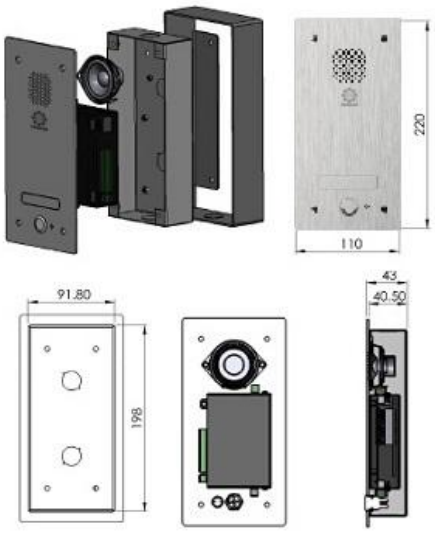
❖ Memory

Type	Memory size	Type	TOTAL Memory size
SDRAM	64M Byte	-	64M Byte
FLASH	128M Byte	-	128M Byte
SPI flash	4M BIT	-	4M Bit

❖ Mechanical & Environmental

Dimensions (W x D x H):	110mm x 43mm x 220mm (with steel plate and outer case)
Weight:	0.8kg
Colour:	RAL7016 and Hairline Steel
Operating temperature:	-10 to +55°C (14°F ~112°F)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

❖ Outer Case



8.7 TERRA-FXO

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	2.66 W	RJ45
24VDC transformer		2.64 W	DC Jack

❖ Sample Rate

Parameter	Symbol	Min	Typ.	Max.
Sample Rate	Fs (LRCK)	8 kHz	-	16 kHz
PCLK Input Frequency	PCLK (SCLK)	256 kHz	-	8192 kHz

❖ Memory

Type	Memory size	Type	TOTAL Memory size
SDRAM	32M Byte	-	32M Byte
FLASH	128M Byte	-	128M Byte
SPI flash	4M BIT	-	4M Bit

❖ Mechanical & Environmental

Dimensions (W x L x H):	110mm x 104mm x 32mm
Weight:	0.43kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

❖ Support paging by using ATEÏS IDA8, ECS, LAP G2T, UAP G2 processors.

8.8 TERRA-IO

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	2.88 W	RJ45
24VDC transformer			DC Jack

❖ Logic Input

Item	Condition	Min.	Typ.	Max.
Logical Input	Low Active	-	-	1VDC
	High Active	4VDC	-	

❖ Memory

Type	Memory size	Type	TOTAL Memory size
SDRAM	32M Byte	IS42S83200D-7TL	64M Byte
FLASH	128M Byte	HY27UF081G2A	128M Byte
SPI flash	4M BIT	W25X40VSSIG	4M Bit

❖ Mechanical & Environmental

Dimensions (W x L x H):	110mm x 104mm x 32mm
Weight:	0.42kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

8.9 TERRA-K

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	>19VDC	3.12 W	RJ45
24VDC transformer			2Pin EURO Block@3.81mm

❖ Analog Audio Specification

Item	Condition	Min.	Typ.	Max.
Sensitivity	-	0 dBu	20 dBu	-
Equivalent Input Noise	20 dB gain,20~20kHz@150Ω	-	-80 dbra	-80 dBu
THD+N	20 dB gain,-20 dB input,50Hz~7kHz	-	< 1%	-
Frequency Response	20 dB gain,-20 dB input, 50Hz~7KHz	-	1dBu	-
Sampling rate	8kHz	-	8KHz	-
Phantom power	-	1.5VDC	2VDC	2.5V

❖ Mechanical & Environmental

Dimensions (W x D x H):	135mm x 125mm x 350mm (with gooseneck mic)
Dimensions (W x D x H):	135mm x 125mm x 95mm
Weight:	0.8kg
Colour:	RAL7016
Operating temperature:	-10 to +55°C (14°F-112°F)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

8.10 PPM-IT5

❖ Electrical

Item	Voltage	Max Power Consumption	Connect Type
PoE	44~57VDC 250mA	6 W	RJ45
24VDC transformer	18~30VDC		DC Jack

❖ Microphone Output

Maximum level	6dBu
Output Impedance	100 Ohm
THD	@ 1kHz < 1%
Bandwidth	@ -3dB = 100Hz ~ 18kHz
Noise Gate Threshold	-84dBu ~ -24dBu
Target Output Level	0
Max Output Level	-54dBu ~ 6dBu
Attack Time	8ms
Release Time	100ms

❖ Front Panel Speaker

Impedance:	4Ohm
Maximum Power:	1 W @ 1kHz
THD:	< 1% @ 1kHz
Bandwidth:	200Hz ~ 12kHz @ -3dB

❖ Connection & Touch Panel

Maximum Cable Length	100m on Category 5 cable
Screen	Diagonal: 5" Resolution: 800 x 480

❖ Mechanical & Environmental

Dimensions (W x L x H):	250mm x 140mm x 80mm
Microphone Length:	275mm
Weight:	1.1kg
Colour:	RAL7016
Operating temperature:	-5ºC~55ºC (23ºF~131ºF)
Storage temperature:	0 to +50°C (32°F ~112°F)
Relative humidity:	0% to 70% (non-condensing)

8.11 Safety

CE/EMI	EN 55013/CISPR13
CE/EMS	EN 61000-4-2 (ESD)
UL EMC	
TUV (TERRA-K)	
IP67 (TERRA-K)	

9 Contact Infomation

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