

Everything You (Really) Wanted to Know About the M-9000 Series



A User's Guide



Rev 1.1

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How To Use This Guide

First, congratulations on your choice of the TOA M-9000 Digital Modular Mixer / Matrix. The M-9000 is one of the most versatile and cost-effective audio products available, designed to function in a myriad of mixing, paging and room-combining applications. However, as with many DSP-based products on the market today, the M-9000 does have a reasonable learning curve. This guide is not a substitute for operations manuals, but should be used in conjunction with them. It is being presented as a means of illuminating systems designers and installers, as well as end-users with a better understanding of how to make the most of the M-9000 Series' potential. In short, it is designed to be your M-9000 "survival kit". This will be a simple, concise guide on to how to configure, program and operate your M-9000 unit. If you're reading this, perhaps it means you've tried sifting through chapters in the manual, spent countless hours staring at the front panel (or GUI) display and now you're engaged in pulling out hair follicles. You're probably just looking for some real-world answers to your questions. In this guide we will explore (and answer) those questions together.

The Table of Contents is set up to easily find information about the M-9000 by topic and by related questions.

Occasionally, there will be footnotes or vital information denoted by:

*

or by



Please pay special attention to these, as they are meant to save you from confusion and unnecessary aggravation.

This guide is also intended to be a "living" document. As questions and challenges arise from installers and users alike, we will amend this guide to reflect them.

Lastly, there are links to various other resources at the end, which if used in conjunction with this guide, should make working with M-9000 Series more productive.

Well, let's go to it!

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1. Hardware Configuration

Out of the Box:

a. What Comes Supplied With My 9000 Series Unit?

Generally, ALL 9000 Series mixers are packaged with the following accessories:

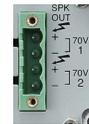
- IEC Power cord
- Removable control block connector (for Volume 1-2 & control In/Out 1-4).....
- Rack-mount ears (Yey!)
- Blank panels for all module slots **except** for module slot #1.
- Quick Start Guide for MIXER & MATRIX modes
- CD-ROM containing operations manuals (pdf) for Mixer & Matrix modes, plus GUI & Excel programming software and Maintenance PC application.
- 5 Year Warranty
- There are additional phoenix connectors provided as well. However, these may vary slightly by model:



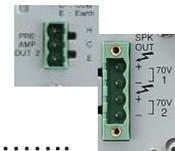
- **M9000:** (2) 3-conductor Phoenix connectors (for Channels 1 & 2 balanced line outputs).....



- **A-9060DH, 9120DH & 9120DL:** (1) four-conductor phoenix connector (for Channels 1 & 2 speaker outputs).....



- **A-9060S, 9120S & 9240S:**
 (1) Balanced Phoenix connector (Channel 2 line output).....
 (1) Two-wire phoenix connector (Channel 1 Speaker output).....



b. What State is the 9000 Series in when it is first Powered On?

- Currently, the 9000 Series in all its forms comes out of the box **set to MIXER Mode**. However, when first powered on, all inputs feed all outputs (how many depending on which modules are installed). This enables you to test the audio through-put (all sources and all zones) without the need for programming. Once audio has been verified, you can proceed to program the unit for your particular needs. **Note: When starting the unit in MATRIX mode, this also occurs, BUT-be aware-this is a one time only offer-ONCE YOU'VE ENTERED THE MENU OR BEGIN TO CHANGE ANY PARAMETER, THE UNIT GOES TO MATRIX MODE AND AUDIO ROUTING DISENGAGES** (until you program the signal routing events into it).

c. What function does each module perform?



D-001T Dual Mic/Line Input Module with DSP

- Two Balanced Mic / Line Inputs
- Digital Signal Processing:10-Band Parametric EQ , Bass / Treble, Loudness, High and Low Pass Filters, Compressor, Adjustable Sensitivity (mic/line) Phantom Power (24 VDC)
- Removable Terminal Block
- Required for VOX (Voice-Operated Switch) function and input signal level metering



D-001R Dual Line Input Module with DSP

- Two Unbalanced Line Inputs
- Digital Signal Processing:10-Band Parametric EQ , Bass / Treble, Loudness, High and Low Pass Filters, Compressor, Adjustable Sensitivity
- Dual summing RCA connectors
- Required for VOX (Voice-Operated Switch) function and input signal level metering



AN-001T Ambient Noise Control Module

- Automatically adjusts output gain to compensate for changes in ambient noise level
- Each input can be assigned to control a specific output
- Two inputs with +24VDC phantom power for condenser mics
- 14 preset gain ratios
- Accessory sensing microphone available, model AN-9001



ZP-001T Telephone Paging Module

- Telephone Access Paging to up to eight zones
- Uses DTMF dialing to access amplifier and/or line outputs
- Dial up to eight output zones in one operation
- Analog extension or page port compatible
- Page port operation requires contact closure activation and DTMF signal pass-through
- RJ-11 Telephone Jack and Removable Terminal Blocks



T-001T Dual Line Output Module

- Two Balanced Line Outputs
- Digital Signal Processing:10-Band Parametric EQ, Bass / Treble, Loudness, High and Low Pass Filters, Compressor, TOA speaker EQ presets, Delay (Mixer mode only)
- Removable Terminal Block
- Output signal metering



C-001T Input/Output Control Module

- Eight assignable control inputs for activating Event/Scene, Volume Up/Down (Input or Output), Mute (Input or Output), Power On/Off, Emergency Mute or Synch On/Off
- Eight assignable control outputs for activating external devices
- Adds control Inputs/Outputs #5 through #12
- Removable Terminal Block

900 Series Modules

- NOTE:
- Various Input, Output and special function modules designed for the BGM, 700 & 900 Series will also work with the 9000 Series. However, the operation of many of these modules may be limited as follows:
- **Input & Output** modules do NOT provide the DSP features, VOX, metering capability and are not in a two-channel configuration as are the 9000 modules. They will provide audio and those that have local remote and/or mute-send/receive functions will operate in that way. Except for volume no settings from these modules can be programmed using the 9000's software or front panel controls.
- **Speaker EQ & Compressor** modules may work in any designated output slot, but will receive DC power only and will not route any audio internally. A signal may be patched through these modules via the **Pre Out/Amp In loop** (powered 9000 models), or directly from a line out and through to an external power amp input.
- **Special function modules**, such as tone generators, message repeaters, etc..., will output audio to the mixer and will have level adjustment and may be routed to any desired outputs. *Please refer to the 900 Series Module Guide for more details.

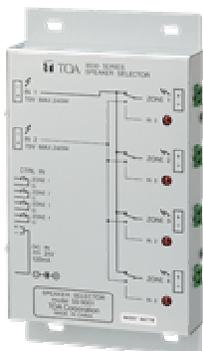


Other Accessories:

AN-9001 Ambient Noise Sensing Microphone



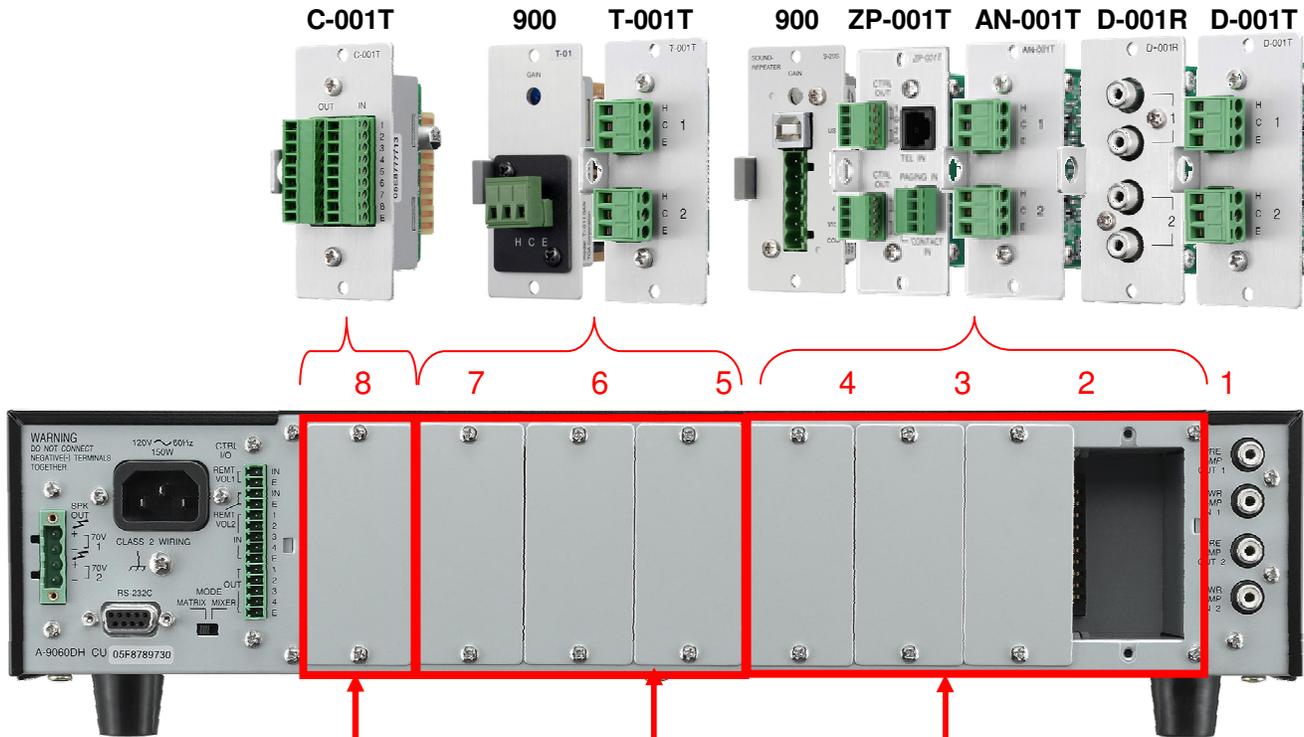
- Up to 2 may be used with each AN-001T module
- Omni-directional condenser type mic element
- 24VDC phantom power operation (provided by AN-001T)
- Single-gang box for easy mounting
- Removable 3-wire phoenix connector
- Low-profile, easily removable cover plate
- Each of up to (4) AN-9001s may be assigned to sense/control a separate zone or several may be assigned to control a single zone.



SS-9001 Speaker Selector

- Switch up to four speaker lines on one amplifier output
- Two amplifier inputs for Paging/BGM applications
- Triggered by ZP-001T module control outputs
- Wall-mountable case
- Requires optional 24VDC power supply, model **AD-246**

d. Which Modules Go Where?



First open Slot after ALL others:

- C-001T
 - Max of **1**
- Slot 8: C-001T *only*

Slots 5-7:

- T-001T (ALWAYS starting from Slot # 5)
 - Max of **3**
- 900 Series (After 9000 Series)
 - Up to **4** (output & special modules only)

Slots 1-4:

- D-001T
 - Max of **4**
- D-001R
 - Max of **4**
- AN-001T
 - Max of **2**
- ZP-001T (after D / R / AN)
 - Max of **1**
- 900 Series (after 9000 Series)
 - Up to **4** (Input & special modules only) ⓘ
- Either D or AN modules may be ordered in any way starting from Slot 1-up to four total

ⓘ Up to (4) S-20S message repeater modules may be loaded into current versions of the 9000 Series. However, some earlier version will only support two. Please contact product support if you are not certain of which production version 9000 unit you have.

[Example of audio 8 IN/8 OUT and control 12 IN/12 OUT configuration]

8	7	6	5	4	3	2	1	Slot No.
C-001T Control 8 inputs 8 outputs	T-001T Audio 2 outputs	T-001T Audio 2 outputs	T-001T Audio 2 outputs	D-001T Audio 2 inputs	D-001T Audio 2 inputs	D-001T Audio 2 inputs	D-001T Audio 2 inputs	

[Example of audio 5 IN/4 OUT, control 4 IN/4 OUT, and ambient noise sensor 2 IN configuration]

8	7	6	5	4	3	2	1
Open slot (Attach the blank panel)	Open slot (Attach the blank panel)	900 series module Audio 1 input	T-001T Audio 2 outputs	900 series module Audio 1 input	900 series module Audio 1 input	AN-001T Ambient noise sensor 2 inputs	D-001T Audio 2 inputs

[Example of audio 2 IN/4 OUT, control 4 IN/4 OUT, and ambient noise sensor 2 IN configuration]

8	7	6	5	4	3	2	1
Open slot (Attach the blank panel)	Open slot (Attach the blank panel)	Open slot (Attach the blank panel)	T-001T Audio 2 outputs	Open slot (Attach the blank panel)	900 series module Audio 1 input	ZP-001T Audio 1 input	AN-001T Ambient noise sensor 2 inputs

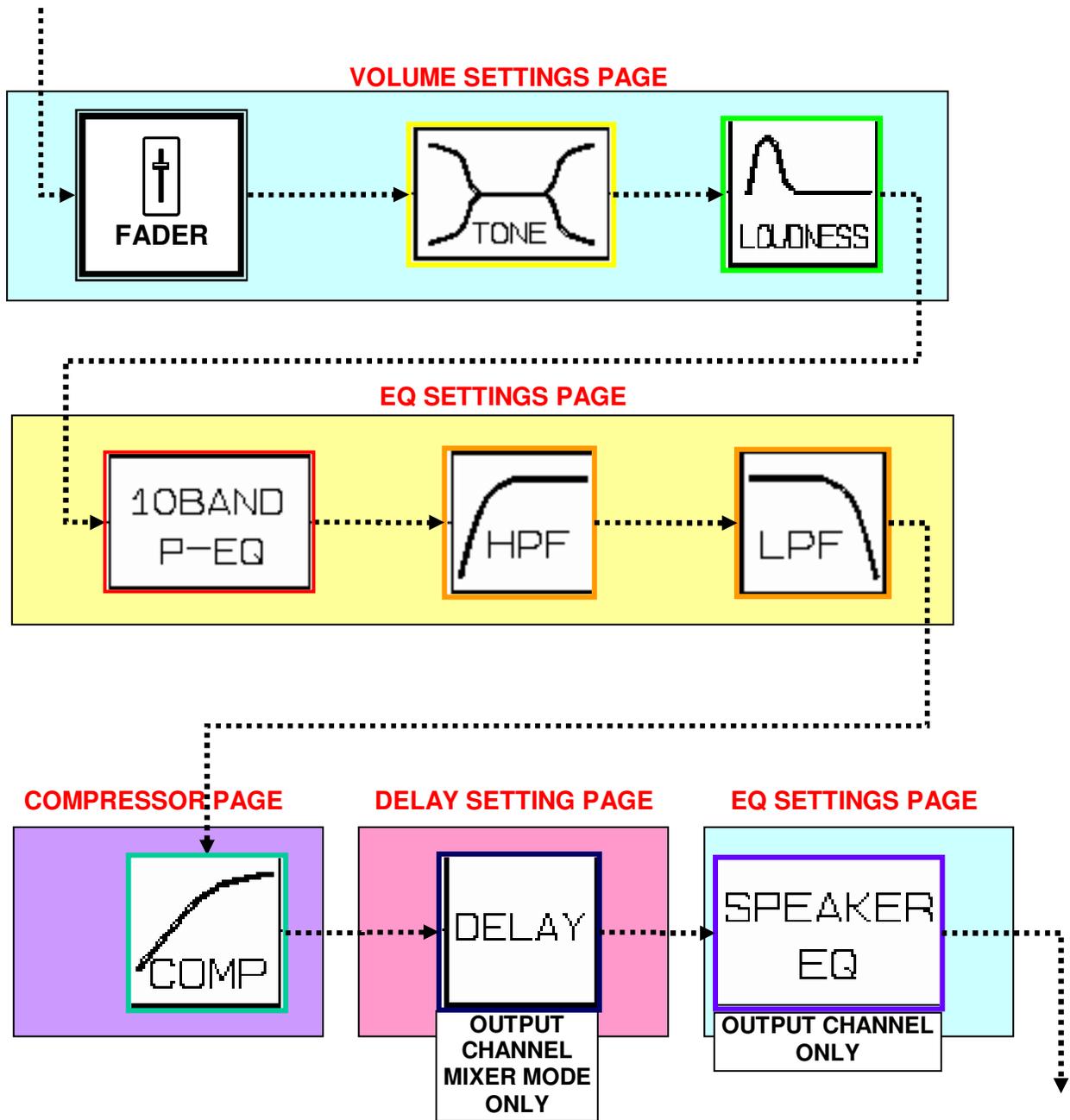
ⓘ “D” modules should be grouped together and not alternated with “AN” modules. The best way to determine module slot configuration is to use the 9000 series GUI Software on your PC. The software will not permit “illegal” module configurations.

900 Series Modules: The following 900 Series modules are available and will work in the 9000 Series Module Slots. Please refer to the 900 Series Module Guide for more detail:

- **Input: Mic-** ML-11T, M-01S/F/M/P, M11S, M-41S, M-51S/F, M-61S/F, M-03P, M-21S
- **Input: Line-** ML-11T, B-01S/F, L-01S/F, U-01S/F, U-01P/R, U-03S/R, B11S, L-11S, U-11S/R, U-12S, U-13S/R, U-14R, B-21S, U-21S, B-41S, L-41S, U-43S/R, U61S
- **Line Output-** T-01S, T-02S, T-12S
- **Special:** S-01S, S-02S, S-04S, S-20S, V-01S (*E Series equalizer modules are not required, since the 9000 Series outputs include the EQ for these speakers).

e. What DSP functions are available in each module?

Below is a block diagram of the Input/Output DSP Functions:



ⓘ Input/Output Channel and Control DSP functions are contained within the module hardware itself and are not available unless these modules are installed in the 9000 Series Frame: D-001T, D-001R, T-001T, C-001T. The 9000 Series Mainframe includes 2 channels of Output DSP. The above DSP functions are NOT available for AN-001T, ZP-001T or 900 Series modules.

f. When do I need to use this module?

- **D-001T:** When connecting 1 or 2 balanced mic or line input sources.
- **D-001R:** When connecting 1 or 2 unbalanced line sources. Channel 1 or Channel 2 – 2 x RCA connectors provide stereo signal summing. Or use one RCA connector from Channel 1 and one RCA connector from Channel 2 for Stereo Input.
- **AN-001T:** When using 1 or 2 AN-9001 sensing mics for Ambient Noise Control
- **ZP-001T:** When interfacing with a telephone analog extension port (FXS) (Ring Signal Mode), to allow using a phone extension as a paging source or to a standard line level audio output of the telephone system which passes DTMF signals with a contact closure output (Paging Port Mode).
–NOTE: If there is a standard line level audio output from telephone system which does not pass DTMF, or does not have the contact closure output, we would instead recommend using a D-001T module with the input set to VOX.
- **T-001T:** When connecting to 3 or more external amplifiers (the base 9000 unit has at least 2 outputs, either 2- line outs, 2- powered outputs or one of each).
- **C-001T:** When connecting to 5 or more contact-closure ins or outs (the base 9000 Series unit has a compliment of 4 contact closure ins & outs).
- **900 Series:** When a special function (i.e.-message repeater, tone generator) or only simple operation is required (input w/volume control). These also work in a pinch when a 9000 Series module is not available.

g. What if I Need More Inputs/Outputs?

- The input/output configuration on the 9000 Series may be expanded to a full compliment of 8 Inputs (4 modules) x 8 Outputs (3 modules, plus built-in 1&2). If the application requires more than this, you have a few options:
 - a. Although 9000 units cannot be truly “cascaded”, the outputs of one may be “subbed” into the inputs of another unit. It’s also possible to set programming via contact in/out so that memory change and other functions may operate in sync.
 - b. Depending on the application, the inputs or outputs of multiple 9000s may be able to operate independently (negating the need for running in tandem). For example: when running independent paging or BGM sources to isolated zones. Beyond this, there may simply be a need for a larger mixer (check out the TOA D-901).

h. What are the PRE OUT & AMP in connections used for?

These are used as a “loop” in/out and allow connection of external processing equipment (such as an equalizer, compressor or feedback suppressor). Of course, the good news is the 9000 Series is equipped with an ample amount of on-board processing. However, in the event you require some piece of outboard gear to patch in between the preamp and power amp sections, these loops (also referred to as “inserts”) are provided on the powered models. There are 2 channels of in/out loops on the dual powered versions-A-9060DH, A-9120DH & A-9120DL, and a single loop in/out on the A-9060S, A-9120S & A-9240SH.



2. Getting Around the Front Panel Controls

a. What do these buttons and knobs do?



- 1. Input Select 1-8:** Selects the input channel to be controlled from either INPUT VOLUME and ON/OFF controls or channel to be edited from the menu. These are also used to enter the 4-digit security password for accessing locked areas.
- 2. Input Volume:** Controls the volume of the selected input channel
- 3. Input On/Off:** Turns the selected input channel ON or OFF
- 4. Output On/Off:** Turns the selected output channel ON or OFF
- 5. Output Select:** Selects the output channel to be controlled from either OUTPUT VOLUME and ON/OFF controls or the output channel to be edited from the menu. Pressing repeatedly toggles through the available output channels.
- 6. Output Volume:** Controls the volume of the selected output channel
- 7. Memory:** Selects the memory page to access memories to be recalled, saved or deleted.
- 8. Enter:** Verifies the current write or recall mode, such as "INITIALIZE MEMORY", "MEMORY RECALL", "SAVE CHANGES", "ETC..."
- 9. Parameter:** Varies the value of the selected parameter
- 10. Utility:** Accesses the UTILITY menu, which controls various global settings.
- 11. Esc/Back:** Reverts back to the previous menu page (v3.13 firmware & higher) or escape to normal mode (v3.20 firmware and higher).
- 12. ▲/▼/◀/▶:** Navigation controls for accessing menu pages, parameters and characters for naming.
- 13. Power:** Turns power to the unit on or off. When power is "Off" and the unit is still plugged into a live power source, the unit is in "Standby", from which it can perform various remote power on/off functions.

b. What do the indications on the display mean?



1. Alpha-numeric Display (left side of “:”): Indicates Channel/Preset/Parameter Name. The **COM** indicator remains lit during communications via the RS-232C interface. The **FAULT** indicator lights when unit failure or other abnormal conditions have been detected.

2. Input Level Meters: Indicates the input signal level to each channel. Only channels which have corresponding 9000 Series modules installed will display levels. 900 Series modules and ZP-001T modules do not show input level. Pressing the down arrow on the navigation controls (when not in the edit menu) switches the display to show fader level marks. Adjusting the input channel’s level control will change the fader level, but not the input level. Only adjusting the source level or input sensitivity level will change the input level reading. A red **LED** next to the channel number indicates the channel which is selected for adjustment. A blinking channel number indicates that channel is muted (off).

3. Output Level Meters: Indicates the signal level to each output channel. Pressing the down arrow on the navigation controls (when not in the edit menu) switches the display to show fader level marks. Adjusting the output channel’s level control will change the fader level, but not signal level. Only changing the level of input channels routed to that output will affect the output’s signal level reading. A red LED next to the output channel number indicates the channel which is selected for adjustment. A blinking channel number indicates that output channel is muted (off). Only channels which have corresponding 9000 series modules installed, in addition to the 9000 Mainframe output channels will show a number or have a meter display reading.

4. Alpha-numeric Display (right side of “:”): Indicates the currently selected parameter’s value or channel’s status. A unit display to the right indicates units (dB, Hz, kHz, mSec) of the displayed value.

5. Indicates which effects are activated for the selected channels. Each one blinks when being edited.

c. How do I edit from the front panel.....

1. In Mixer Mode?



- a.** Working within the currently active memory preset (scene), when an input or output channel has been selected, pressing the “▶” arrow on the navigation controls enters the edit menu.
- b.** Using the “▲/▼” arrows scrolls through the parameters for that input or output channel (parameters may vary depending on the module installed).

- c. Pressing the “▶” again highlight the parameter value portion of the menu. Once a specific parameter has been selected, another channel may also be selected for adjustment of that same parameter (assuming similar module type).
- d. Adjusting the Parameter Knob changes the value of the selected parameter.
- e. Pressing the “ESC/BACK” key reverts to the previous edit page or escapes the edit menu.
- f. Pressing the “MEMORY” button accesses the preset memory register.
- g. Adjusting the PARAMETER” knob selects the memory slot to be used.
- h. Pressing “ENTER” stores the current settings to that scene.
- i. Pressing the “UTILITY” button accesses the utility menu, where global or special functions may be edited. These settings are not stored with presets, but with configuration templates.
- j. The Utility menu is navigated the same way as the main edit menu, but to escape, press the “MEMORY” button and any channel button.

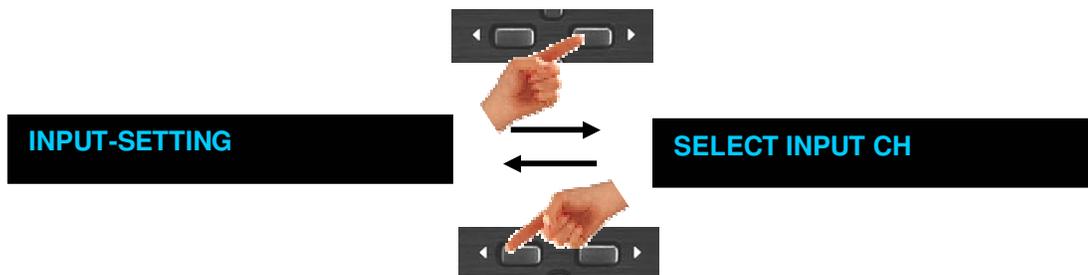
II. In Matrix Mode?



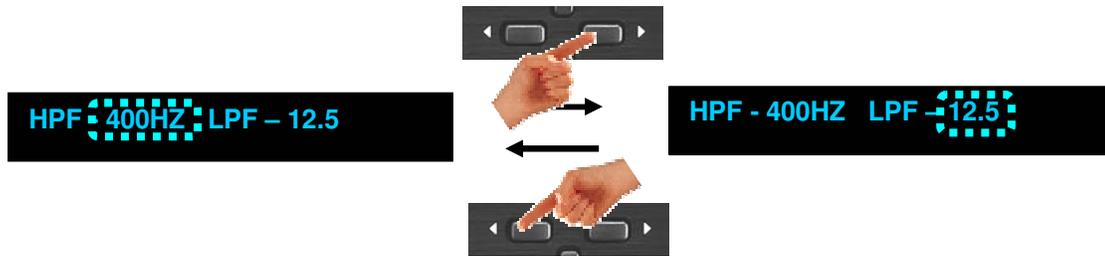
- a. To enter, delete the display indication by pressing the **MEMORY** key (screen goes blank),
- b. Then holding down the **UTILITY** menu key for 2 seconds or more displays the setting menu screen.
Note: You cannot enter the setting mode as long as any indication is displayed in the upper line of the VFD screen.
- c. Then, using the navigation keys (▲/▼/◀/▶), items may be selected in the display

Examples of using the **Left** and **Right** arrow keys:

When moving the setting screen:

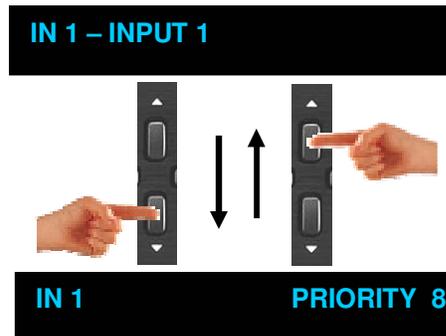


When moving the setting item on the same screen:



Example of using the **Up** and **Down** arrows:

When accessing parameter or item pages within the settings menu:



- d. **Returning to NORMAL operation:** Press the **ESCAPE/BACK** key when the setting screen returns the display to the setting start screen (upper hierarchy level).
- e. Pressing the **MEMORY** key at the setting menu screen saves the setting contents and returns the display to the normal use state.

d. How do I program an Event in Matrix Mode from the front panel?

Programming EVENTS in Matrix Mode is broken down to essentially four parameters: INPUT SELECT, EVENT TYPE, TRIGGER & OUTPUT ASSIGNMENT. Here is the procedure for EVENT settings:

1. Hold **UTILITY** button 3-5 Seconds
2. Then rotate **PARAMETER** knob to **EVENT-SETTING**.
3. Press the **RIGHT ARROW** to **EVENT01** (01 Flashing): **NONE**
4. Then press the **RIGHT ARROW** TO **EVENT01: NONE** (NONE Flashing).
5. Rotate **PARAMETER** knob to **ROUTE**.
6. Press the **DOWN ARROW** and select **INPUT#** using the **PARAMETER** knob (or **INPUT SELECT** button),
7. Press the **DOWN ARROW** and select the **OUTPUT#** using the **PARAMETER** knob,
8. Then press the **ON/OFF** button (above the OUTPUT SEL button) to turn on a RED LED next to the appropriate OUTPUT# channel indicator on the display.
9. Press the **DOWN ARROW** and select the **TRIGGER IN** using the **PARAMETER** knob
10. Press the **RIGHT ARROW** to the **TRIGGER IN #** and select a trigger in using the **PARAMETER** knob.
11. Follow steps **d** & **e** above to escape the EVENT SETTING menu.

(Please reference the next section on “Operating Modes” to gain a better understanding of how to use Events in Matrix mode)

3. Operating Modes:

a. What are the two different operating modes best used for?

- Mixer Mode:** Best used for general mixing applications-i.e.-conference rooms, bar/restaurant, retail spaces, etc... Typically, this is for basic paging over background music or live source mixing (such as microphones). The Mixer Mode may also be used for room combining applications. Mixer mode operates with the condition that the environment does not change while a given scene is active. A scene change could encompass ALL sources and settings for a given time and remain in that state until the environment requires a scene change. So, in a room combining scenario: **Scene 1:** room 1 & room 2 are set as independent. **Scene 2:** room 1 & room 2 are combined for one event. Switching between these two “snapshots” scenes will allow the room combining switch to be made smoothly. However, if the two rooms do not operate in sync, then it’s a job for....
- Matrix Mode:** Matrix Mode allows the independent orchestration of individual sources or “events” which may be broadcast simultaneously. As opposed to a global “scene” change memory (as in Mixer mode), where everything changes at once, Matrix mode allows each input source to be “activated” independently from all the others. This provides a mixing environment where each source stands alone and where any source brought on-line will not necessarily interfere with or affect any other source being routed at the same time. This is useful for multi-zone paging and where requirements change at different times.

b. How does operation of these two modes differ?

Here are some examples of how each mode would operate (these are based on a full 8 x 8 configuration):

Mixer: Each SCENE memory would contain all input/output settings and routing and can only be recalled one at a time. Also note that multiple inputs are routed to one or more output (as denoted by the color group).

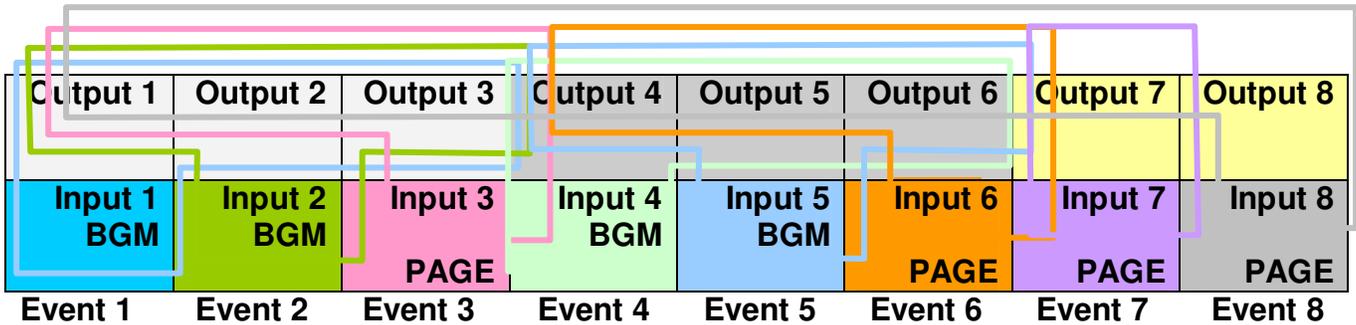
Scene 1:

Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
Input 1 BGM	Input 2 PAGE	Input 3 BGM	Input 4 BGM	Input 5 PAGE	Input 6 BGM	Input 7 MIC	Input 8 MIC

Scene 2:

Output 1	Output 2	Output 3	Output 4	Output 5	Output 6	Output 7	Output 8
Input 1 BGM	Input 2 PAGE	Input 3 BGM	Input 4 BGM	Input 5 PAGE	Input 6 BGM	Input 7 MIC	Input 8 MIC

Matrix: Each Event preset encompasses only single input routed to one or more outputs.



So:

- Event 1-** Input 1 routed to Outputs 1, 2 & 3
- Event 2-** Input 2 routed to Outs 1, 2 & 3
- Event 3-** Input 3 routed to Outs 1, 2 & 3
- Event 4-** Input 4 routed to Outs 4, 5 & 6
- Event 5-** Input 4 routed to Outs 4, 5 & 6
- Event 6-** Input 4 routed to Outs 4, 5 & 6
- Event 7-** Input 4 routed to Out 7
- Event 8-** Input 4 routed to Outs 1-8

*(not shown)

- Event 9-** Base Event consisting of Events 1, 2, 4 & 5
- Event 10-** BGM End Event –Stops broadcast of all background music sources

Each of these “events” may be activated independently *and* simultaneously, by either: voice or audio input activation (VOX), contact closure or serial control (*See “**Controlling the 9000 Series**” on pg. 40) or may be active all the time. In effect these sources are being mixed, but are not activated by a single memory preset. Other than the “ROUTE” events shown above, other types of events may also be programmed:

***Base Event:** Is a collection or set of up to four Route events which may be stored under a single preset and recalled simultaneously. This type of event may be used to bring several BGM sources online at one time and also assigned to be the default memory for power on.

***BGM End event:** An event memory programmed to discontinue routing of all BGM (Background Music) sources. This is a fast and convenient way to stop music sources from playing during an emergency or at end of business.

Below is a comparison description of the two modes:

FEATURE	MIXER	MATRIX
Memories	32 Scenes	32 Events
Memory Activation	Single	Simultaneous
Routing per Memory	Up to eight inputs to up to eight outputs	One input to up to eight outputs
Paging Priorities	2 Levels	8 Levels
Other Functions	Auto-mixing (gating), Cross-point Gain, Delay	FIFO, LIFO, MIX

ⓘ All input/output settings such as level, EQ, compressor, etc... are stored with each scene in Mixer Mode. Therefore, each scene may have different channel settings. Matrix Mode stores routing and control settings for each event and settings for each input are the same for all events it is associated with. In each case, these are stored along with other global settings to the .mix or .mtx template.

c. How do I change the 9000 unit's Operating Mode?

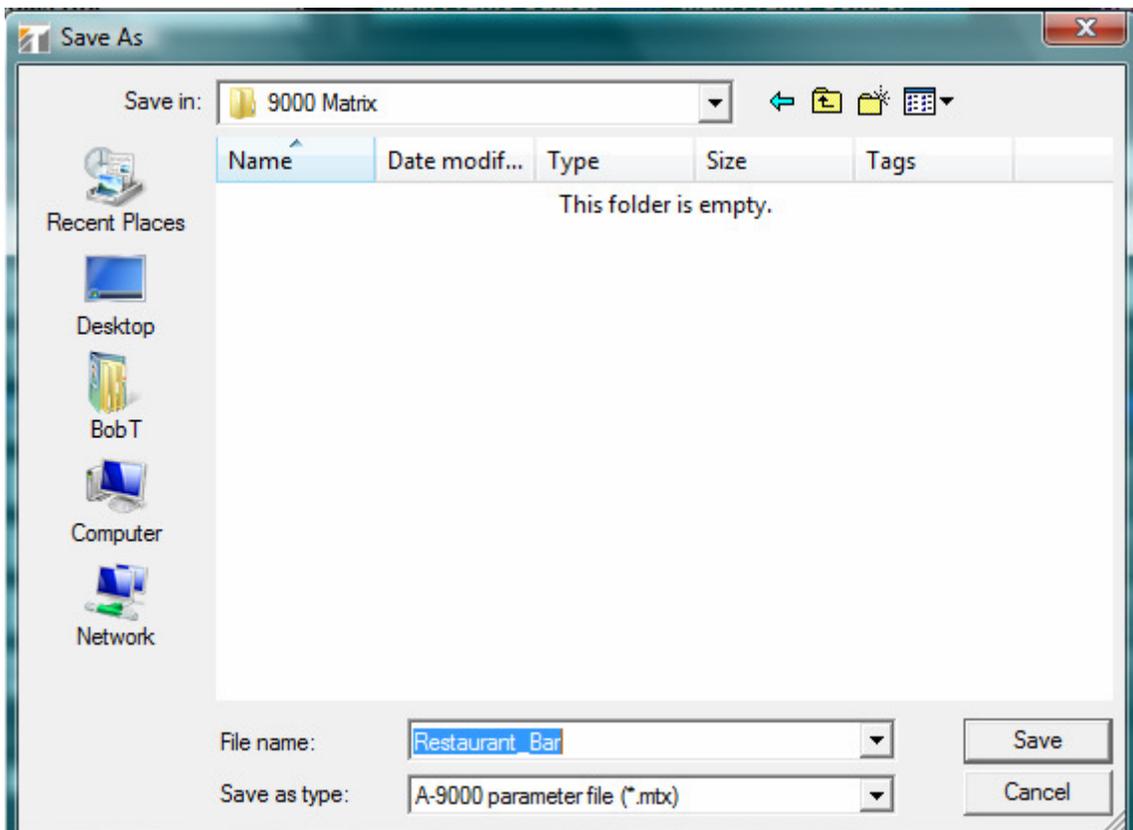
1. With the 9000 unit powered off, unplug the power cord to the back panel or turn off power to the strip supplying power.
2. Move the MATRIX/MIXER switch on the back to the desired position.
3. Reapply power to the unit.
4. When the display reads "INITIALIZE MEMORY?" press the ENTER button on the front panel. After initialization, the 9000 unit will automatically power off.
5. Power the unit back on using the front panel power button.
6. The 9000 unit is now in the new mode. The previous mode's memories and setting are now erased and the unit now will await new programming.



d. How do I save Configurations to a PC?

Once a set of SCENE or EVENT memories have been programmed in the GUI or (EXCEL), these may be saved as configuration files to a PC. The configuration file contains settings for all 32 memories, including global and control settings and will store as either an **.mtx** file (MATRIX file) or **.mix** (MIXER file). These may be named according to application or project.

1. **File > Save As > [folder] > [name].mtx - or- [name].mix**
2. These files may be opened into the GUI software and loaded into the active GUI screen.
3. From there they may be uploaded to a 9000 unit (see “**Communicating with Your PC**”- on page 37)



Similarly, selecting OPEN from the file menu will load a stored template from your PC to the application. Remember that the application mode (Matrix/Mixer) must match the template you wish to load.

4. Programming from the GUI Software

Programming and configuration of the 9000 Series is fast and intuitive using the GUI (Graphical User Interface) software. Using the GUI, a 9000 setup may be programmed entirely off-line, without a unit present and later, settings may be uploaded to one or more units. Be aware that there are similarities and also differences with respect to how the GUI appears and with respect to the various functions in each of the operating modes. Here we will outline these similarities and differences for each of the setting pages or “windows”.

When you first launch the GUI application, the Main setup window appears: This window is generally the same for both MIXER and MATRIX mode, except that the SCENE select box (8) in MIXER mode (lower right), will be labeled (EVENT) in Matrix mode.

a. Mainframe Configuration Settings Page

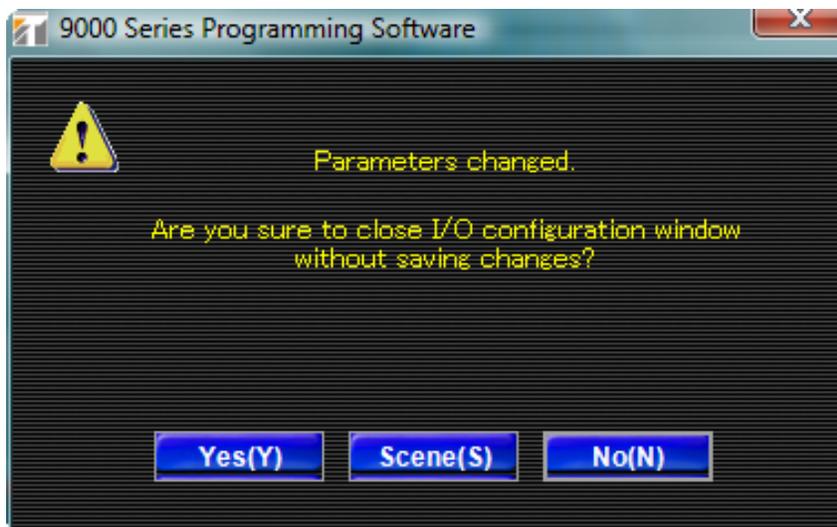


- 1. Model/Mode Select:** The first thing you must do after launching this application is tell it what model you are working with (a drop down with the various versions of 9000, including M9000 will appear), followed by the mode you are operating in (MIXER or MATRIX).

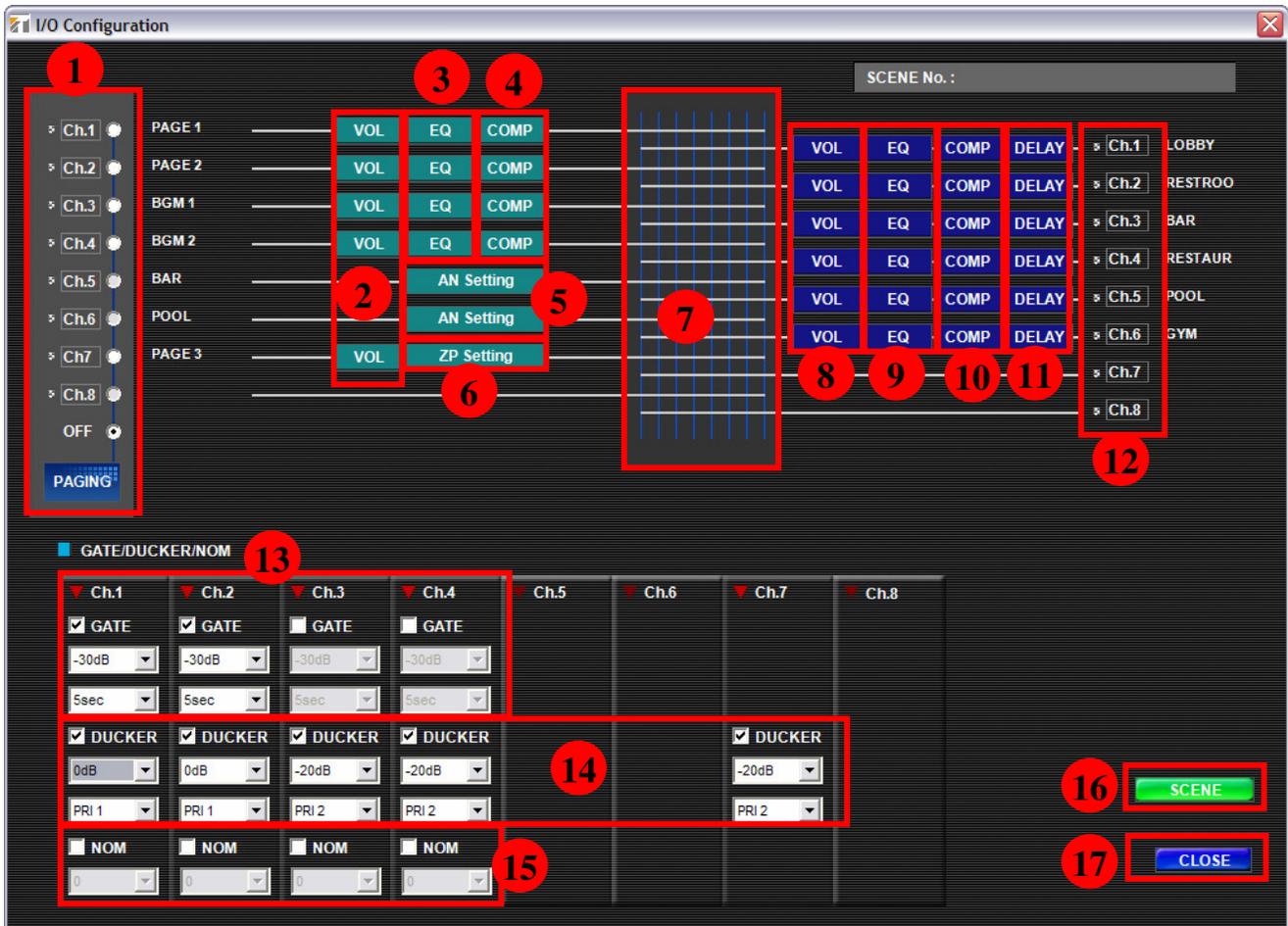
ⓘ Requires 9000 firmware v2.0 or higher

2. The next step is to **assign the modules** to each slot. This must accurately correspond to the actual hardware that is loaded into the 9000 unit's frame. A mismatch may cause a malfunction and will certainly produce a configuration error, when uploading files to the unit. (*see section 1 "Hardware Configuration").
 - a. The **Stereo Link** feature is available in MIXER mode only. It allows linking of both inputs of each two-channel input or output module. Volume, EQ and other channel setting may be adjusted on one channel and the linked channel's settings automatically follow. This is useful for stereo zone applications (not available for AN-001T, ZP-001T or 900 Series modules).
3. With each module populated, a **label "strip"** will appear on the right, corresponding to each module's input/output complement. You may enter a 7 character alphanumeric name for each input and output.
4. The **KEY LOCK** Section allows each input & output as well as the Utility menu & Power button to be individually or collectively locked to deny unauthorized access. A 4-digit numeric password may be entered (1-8), which will be required to enter a locked area from the 9000 unit's front panel. When the "ENTER PASSWORD" display pops up, the password is entered using the front panel channel select (1-8) buttons. **(Note: KEY LOCK should only be set once you have completed all setup and adjustments and are ready to turn the system over to the customer.)**
5. **I/O Module Settings** page. This sections displays all the modules assigned to the frame slots and clicking on any of these accesses the Module Settings page (see below). **MAIN FRAME OUTPUT** –Also accesses the I/O Module Settings Page.
6. **MAIN FRAME CONTROL** Accesses the controller assignment settings for external contact closures and relay outputs.
7. **REMOTE** Accesses programming for ZM control modules or volume controls.
8. **SCENE / EVENT**. This button opens either the SCENE page (MIXER Mode) or EVENT Page (MATRIX Mode), depending on the operating mode and will be labeled accordingly.

ⓘ In GUI v2.10, there is a SAVE prompt window which appears when attempting to close a page where a parameter has been change. This will appear on the I/O Configurations Page and will ask if you will exit without saving (Yes), Cancel exit (No) or Save to a Scene memory (Scene). It will also appear on the EQ page (input & output).



b. I/O Module Settings Page (MIXER Mode)



1. **Paging Assignment-** Clicking one available channel and then clicking on the PAGING button, allows the designated paging source to be assigned to any of 4 page groups or ‘zones’. A page into any output assigned to a group, pages the other outputs assigned to the same group. Channels may also be selectively isolated from an assigned paging group. A right-click on a channel’s label accesses a COPY / PASTE function, allowing that channel’s settings to be copied to any similar channels. ⓘ
2. **Volume Page-** Clicking on any channels “volume” box accesses the volume/fader page, where all input volumes are displayed. This page also displays: Input Sensitivity, Phantom Power (*D-001T only), Bass, Treble & Loudness. An ADJUST button on this page allows parameter adjustment and transfer of the new setting via serial connection to an active 9000 unit. Fader settings for channels which are stereo linked (MIXER mode only) follow each other. Faders appear only when a D-001T/R or 900 Series input modules are installed.
3. **EQ Page-** clicking any EQ box brings up that channel’s 10-band parametric EQ adjustment page. This provides 10 bands of fully parametric EQ (gain, Q & Frequency), plus a High-pas & Low-pass filter. Each band has a check box, allowing individual band ON/OFF. An ALL BYPASS button resets the EQ to default. A SAVE button allows saving the EQ settings to the current SCENE or Configuration (MATRIX mode) before closing the EQ window or making adjustments. There is also an ADJUST function button on this page. CLOSE, closes the EQ window. EQ settings for channels which are stereo linked (MIXER mode only) follow each other. Appears only when a D-001T/R module is installed.

4. **Compressor (COMP).** Clicking any COMP box bring up all available channel's compressor settings. These consist of five presets which are described in further detail below. COMP settings for channels which are stereo linked (MIXER mode only) follow each other. Appears only when a D-001T/R module is installed.
5. **AN Settings-** Clicking this box, calls up that channel's AN (Ambient Noise Control -AN-001T only) settings. These settings allow the noise sensing mic (AN-9001) to be adjusted for sensitivity and the control circuit set for sensing threshold, dB response ratio, range, time window, assigned output and monitor on/off. The channel also provides Phantom Power, which is required for the AN-9001. (*see "Ambient Noise Control"). Appears only when an AN-001T module is installed.
6. **ZP Settings-** Access the ZP-001T telephone Paging Module settings (*see "Zone Paging with the ZP-001T"). Appears only when a ZP-001T module is installed.
7. **Output Assignment Page** (active in MIXER mode only). Clicking this area accesses the assign matrix for outputs and cross-point volume
- 8, 9, 10. **Output Volume, EQ, Comp-** These are identical to the function for the inputs, except that these adjust settings for the OUTPUTS. One additional function is the presence of Speaker EQ presets in the EQ section. You can select from a list of popular TOA speakers and apply an appropriate EQ curve for optimized speaker performance. These presets utilize some of the bands from the 10-band parametric, but the number will vary depending on which speaker is selected. Appears only when a T-001T module is installed.
11. **Output Delay-** (available for Mainframe & T-001T –MIXER Mode only) Calls up the settings for all available channels' output delay. This is adjustable in 1ms increments up to 40ms. This is used to compensate for "slap" delay from speakers spaced far apart fed from different zone outputs. Appears only when a T-001T module is installed.
12. **Output Channel label.** A right-click on an output channel's label accesses a COPY / PASTE function, allowing the channel's settings to be copied to other output channels. ⓘ
13. **Gate.** Each Mic/line input (D-001T/D-001R) may access a Gate function allowing the channel to remain off until sufficient gain is achieved to allow the signal through, thus avoiding unnecessary crosstalk among mics, feedback, etc....Variable Gate threshold and release time are provided. Gating must be used for microphones to facilitate VOX paging functions in both MIXER and MATRIX modes. This is used as part of the AUTOMIX function in MIXER mode.
14. **Ducker.** This is activated for inputs which will function as higher priority paging signals (Mic/ZP) to attenuate or mute BGM (background Music) sources automatically. MIXER mode provides 2 paging priorities, MATRIX mode provides 8.
15. **NOM (Number of Open Mics).** This activates the NOM function for conference and other live applications (MIXER mode only). Automatically attenuates all active mics by a determined dB level, depending on the NOM value entered, thus minimizing gain increase and feedback as open ("live") mics are added. (See "NOM Function –Automatic Mixing")
16. **SCENE.** Accesses the SCENE page, which list all 32 scene presents (EVENT page in MATRIX mode). All current channel settings can be memorized to a SCENE preset for easy recall. Each scene may be named and also assigned to be a power-on default.
17. **CLOSE.** This button closes the I/O Module Settings window.

ⓘ Input or output channel settings may be copied to other channels by right-clicking on the channel labels in this view. Bringing the cursor to another channel and right-click to select PASTE. This copies all fader, EQ, compression and routing functions to that channel. This only works for channels with identical functions (i.e.-D-001T, T-001T).

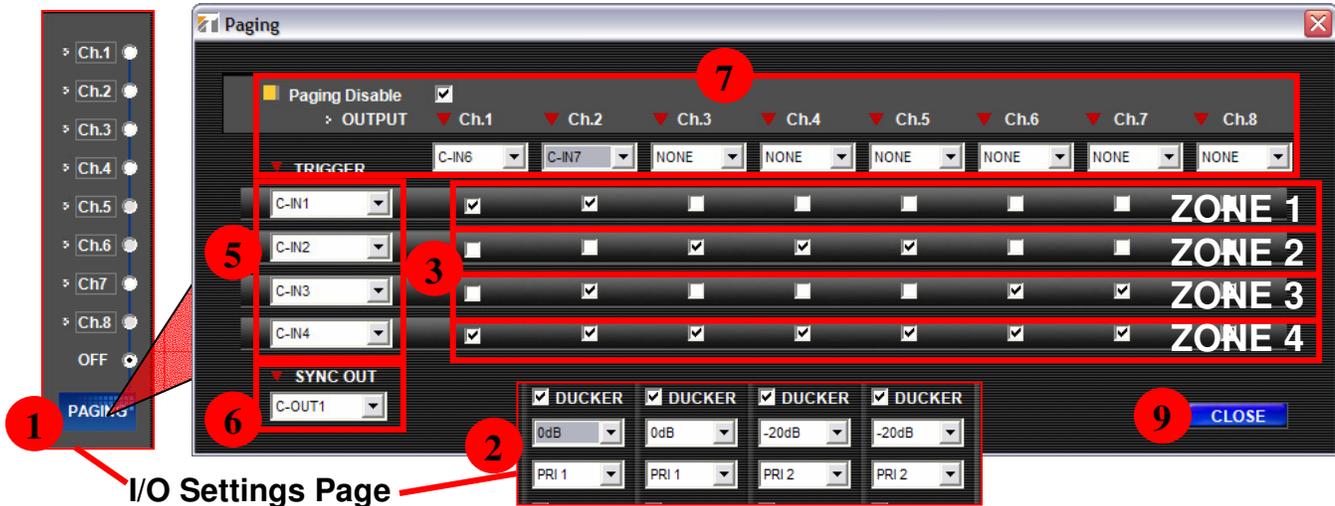
c. Scene Settings Page (MIXER Mode)



A **SCENE** is a memory preset for MIXER Mode. It contains all the channel settings, routing and paging settings associated with a given application. Select a scene # (1-32) by clicking on it and when highlighted, you may perform the following functions:

1. Enter a scene number or name (alphanumeric, 7 character)
2. Assigning a particular scene to be the default scene each time the 9000 unit is powered on by clicking the circle to the right of the desired scene. The mixer may also be assigned to default to the LAST scene which was active before the unit was powered off.
3. Deleting scenes which are checked off (under DEL) by pressing the DELETE button.
4. Loading a scene from a .mix configuration template by selecting the scene # and pressing the LOAD button.
5. Save the current mixer settings to a scene by selecting a scene #, then clicking on the SAVE button.
6. **Scene Copy** (Not Shown) A scene may be copied into other scene presets by clicking on the scene to be *copied to* and pressing the SAVE button. This may be done repeatedly to as many scenes as necessary to copy redundant channel settings such as EQ & levels. The last scene that is copied to, automatically loads to become the active scene.
7. CLOSE. Closes the Scene Settings window.

d. Paging Settings (MIXER Mode)



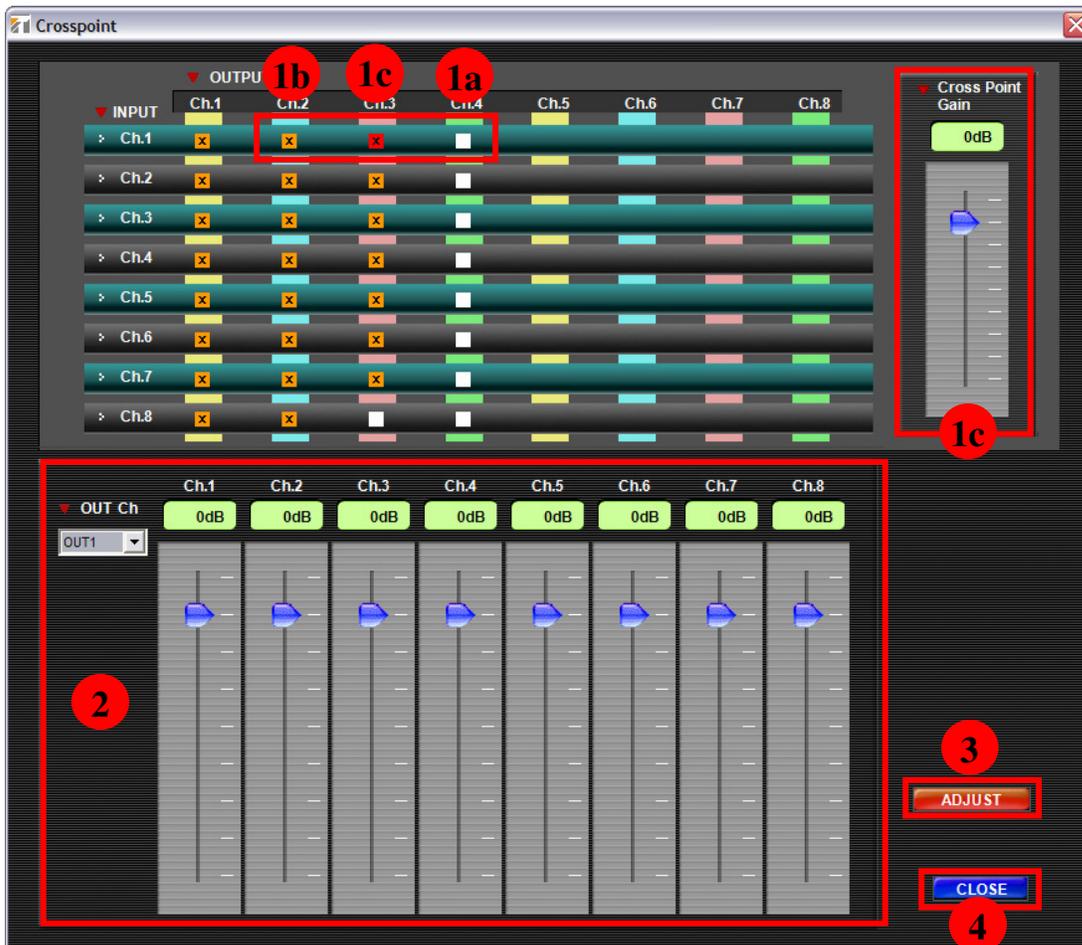
Paging function

The **Paging** function enables paging broadcast patterns to up to 4 output groups. This is used when several different outputs need to be paged at a various times (as opposed to paging to all outputs to which a paging source has been routed). To use the paging function, perform the paging function setting as well as the audio input and output parameter settings:

1. Be sure to set the paging input channel to ON. Otherwise, paging calls cannot be performed. Select by clicking the circle next to the input channel # in the paging box.
2. In the audio input parameter setting page, be sure to set the **Ducker function to ON** for the paging source as well as all sources being controlled by the page. Doing otherwise causes the paging calls to mix with input signal being broadcast,
3. Paging calls can be made to up to **4 paging zones**, to which up to 8 output channels can be assigned. Output channels can be redundantly assigned to each zone only when using a microphone paging source with individual contact closures (1-4). This is not possible with VOX. (*With ZP-001T, please refer to pg 44 –“**Paging with the ZP001T**”).
4. (Not shown) When paging calls are initiated using the ZP-001T Zone Paging Module, select ZP as the paging source. When paging, select (dial) the output channel to be paged from an extension telephone (*see Paging Using the ZP-001T). All other output channels assigned to the same group will also receive the page. Groups may each be assigned with multiple outputs, however, they should not be overlapped, since the check box assignments are not zone assignments when using the ZP module, but combination outputs. Dialing from a phone extension into an output associated with a zone will also page to other outputs assigned to that combination. Dialing “0, 9, #” would function as a 5th ALL CALL page, paging all outputs regardless of their assigned zone. Not checking any boxes in this mode would simply page into the dialed output.
5. When using other modules as the page source input (D-001T, D-001R, S-20S message repeater), select that input as the source channel, and select the control trigger input (1-12 * See Controlling the 9000) which will trigger each of the 4 paging broadcast pattern groups. **When assigning VOX as trigger, only one zone will be active.**
6. A control output relay (SYNC) may also be activated when a page is initiated to facilitate control of external functions (message repeater, emergency lighting, alarm, etc...).
7. Paging prohibited channels can also be set. When paging calls are initiated, if an output channel is set as a paging prohibited channel, no paging calls are made to all of the paging zones to which the output channel is assigned. A contact closure may be assigned to activate this function per output.

8. (Not shown) Activating the paging group function from the 9000 unit's front panel is accessed in the UTILITY menu.
9. CLOSE. Closes the Paging Settings window.

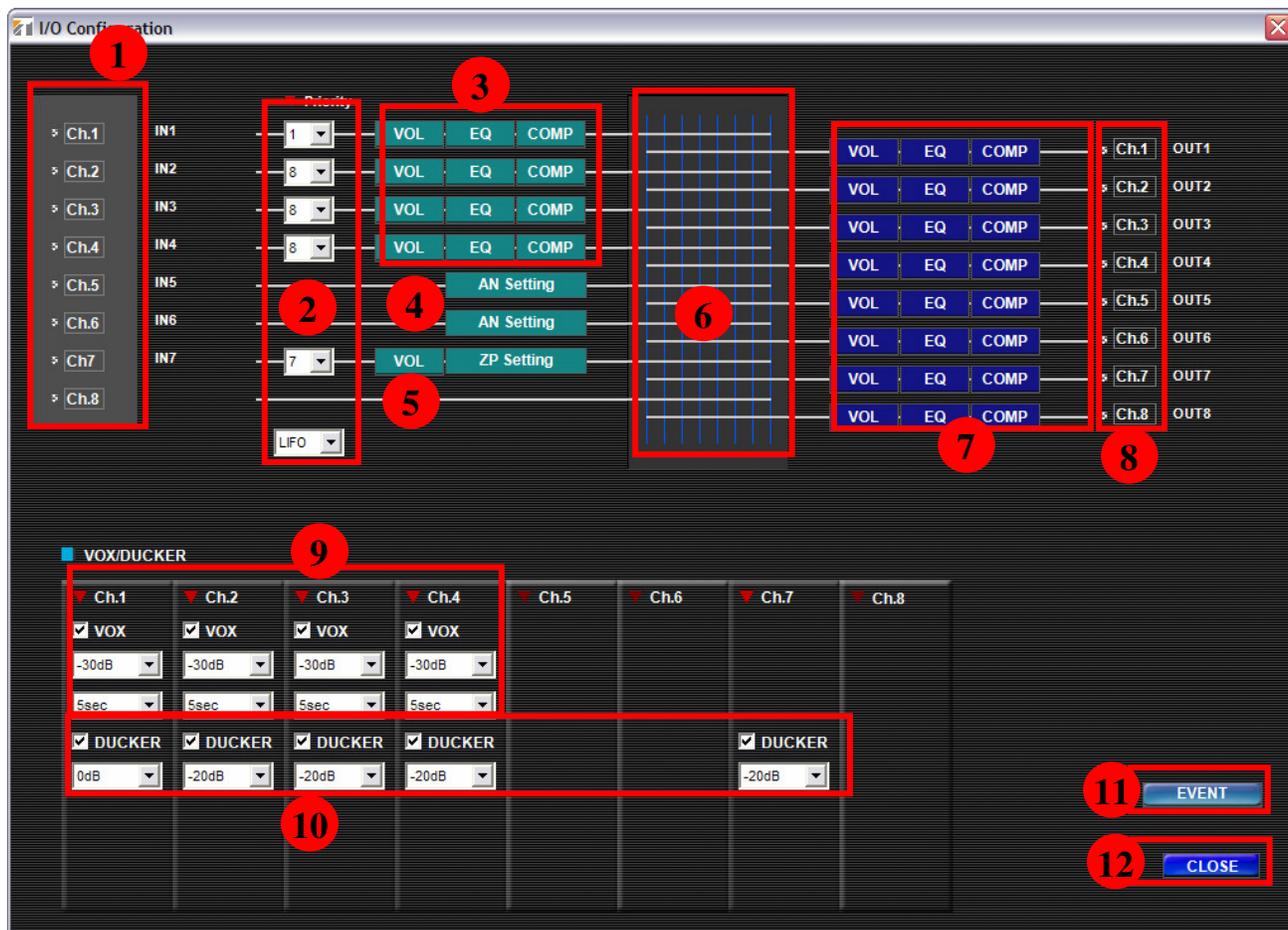
e. Output Assignment Settings (MIXER Mode)



This window allows assignment each input channel to any or all available outputs.

1. Each box in the assignment matrix has a three toggle:
 - a. is OFF (no assignment)
 - b. Clicking once assigns the channel to that output.
 - c. The next click turns the box to RED and activates the cross-point fader on the right side of the display. This adjusts the selected input channel's contribution to that output channel.
2. The **Cross-point Fader level display**. Cross-point fader settings may also be viewed as a group on the bottom half of the display. Selecting the output channel from the dropdown menu selects the cross-point settings display for that output.
3. An **ADJUST** function allows transmission of new settings to a serially connected 9000 unit. Making the assignment/level adjustment and clicking on this button is similar to making an adjustment on the front panel, but is being done remotely.
4. **CLOSE**. Closes the Output Assignment Settings window

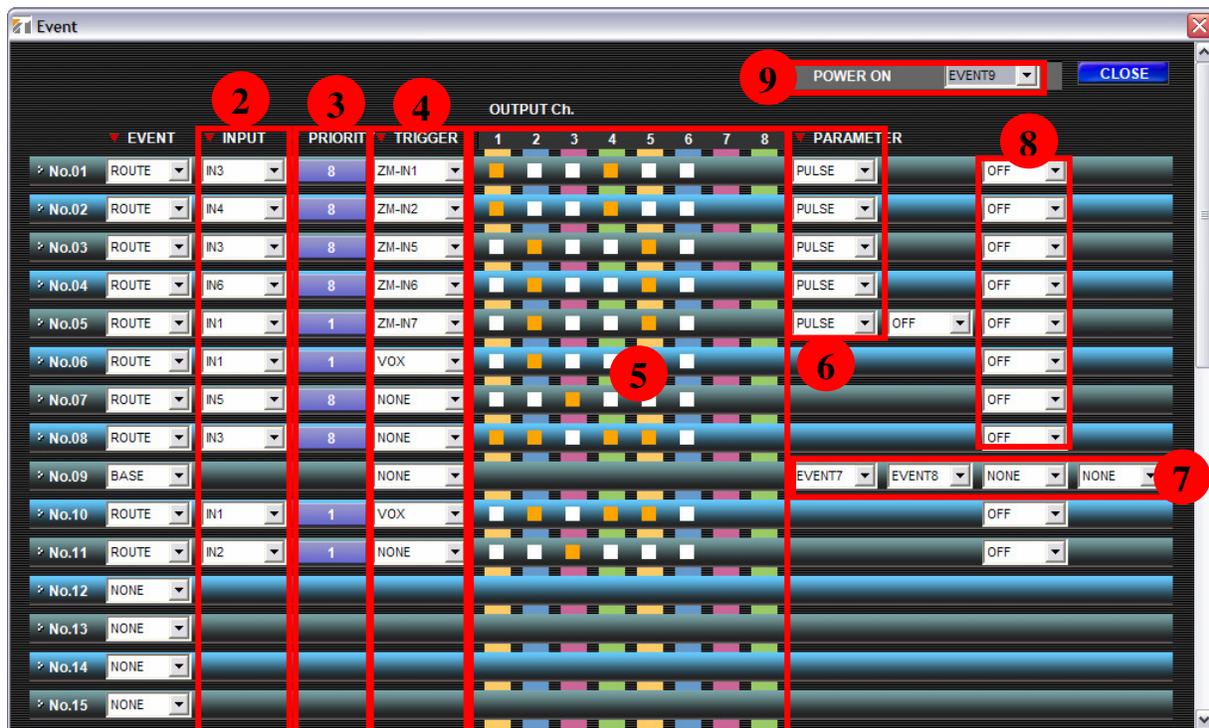
f. I/O Module Settings Page (MATRIX Mode)



1. **Channel label**- A right-click on a channel's label accesses a COPY / PASTE function, allowing the channel's settings to be copied to any similar channels.
2. **Paging Priority**- Each channel may be assigned a paging priority, determining its ability to override (mute/duck) or be overridden by another source. A priority level of 1 (highest-emergency page)) to 8 (lowest-usually for BGM sources) may be assigned. In the event that more than one source has been assigned the same priority level and are being broadcast to the same output, a **FIFO** (First-In, First-Out), **LIFO** (Last-In, Last-Out) or **MIX** mode may be selected to determine which source will be output. In the case of MIX, both sources are mixed. VOX (audio Input) must be selected for any voice-activated paging sources (*see #9)
3. **Volume, EQ Comp Pages**- These functions are exactly the same as in MIXER Mode, except that these settings are Global and do not store to or change with EVENT memory activation. These settings *are* stored with the configuration (.mtx) template.
4. **AN Setting**- Functions identically to MIXER Mode (*see Ambient Noise Control below).
5. **ZP Settings**- Functions identically to MIXER Mode (*see "Zone Paging with the ZP-001T" below)
6. **Output Assignment Page** -Does NOT function in MATRIX Mode (except when ZP-001T is assigned for BGM/PAGE Sub Mode *See "Paging with the ZP-001T"). OK. So where are the output routing assignments? Please read on...
7. **Output Volume, EQ, Comp**- These are identical to the function in MIXER Mode, except that Delay is not available in MATRIX Mode.

8. **Output Channel label.** A right-click on an output channel's label accesses a COPY / PASTE function, allowing the channel's settings to be copied to other output channels.
9. **VOX.** Each Mic/line input (D-001T/D-001R) may be assigned a VOX function (similar to gate) allowing the channel to be activated for paging by voice or audio input (assignable in the EVENT Page). Adjustable threshold and release time.
10. **Ducker.** This is activated for inputs which will function as higher priority paging signals (Mic/ZP) to attenuate or mute BGM (Background Music) sources automatically. MATRIX mode provides 8 paging priority levels which can "Duck" sources which are lower in priority.
11. **EVENT.** This accesses the EVENT page, which lists all 32 EVENT presents. Input source, activation trigger (contact, VOX or NONE) and output assignments are selected in this page. Any ROUTE or BASE EVENT can be assigned to be the power-on default.
12. **CLOSE.** This button closes the I/O Module Settings Page.

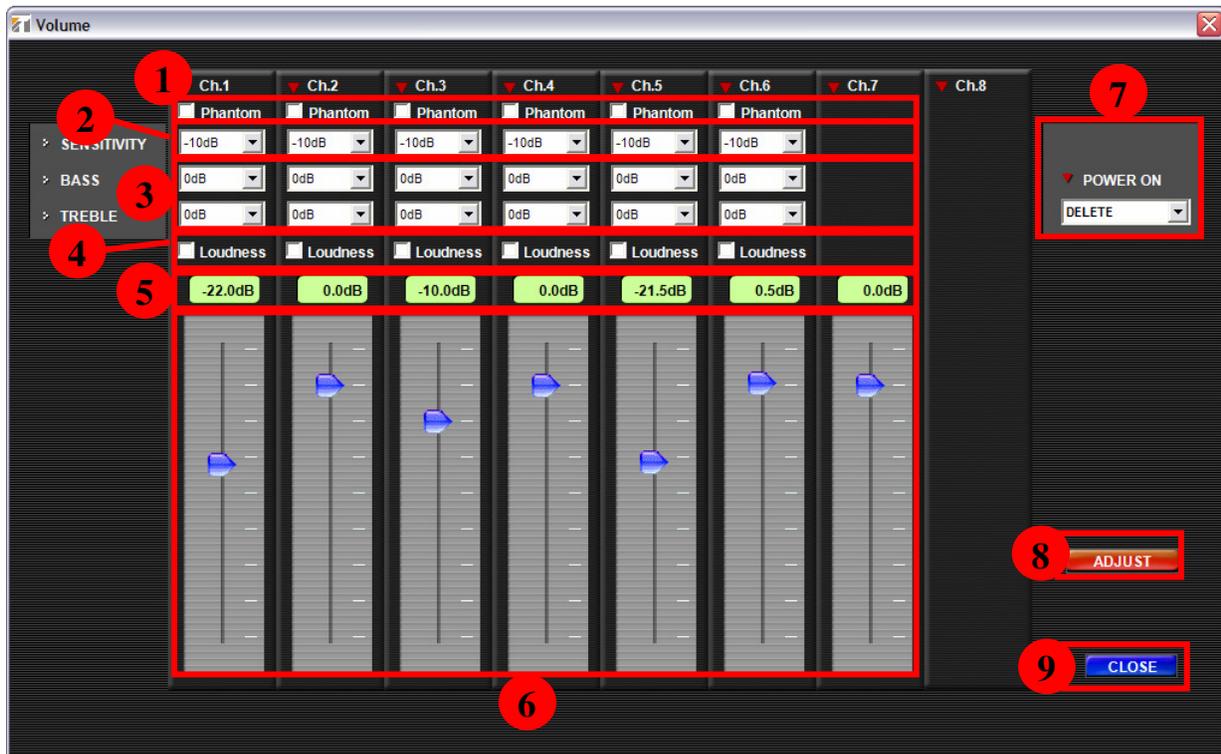
g. Event Settings Page (MATRIX Mode)



Each EVENT encompasses a single memory slot (1-32). For each event, the following settings may be selected:

1. Selects the **EVENT type**: ROUTE, BASE or BGM END (*See Glossary-Matrix)
2. Selects the **input to be routed** (ROUTE EVENT Only)
3. Indicates **Output Priority** (set in Channel Setting page)
4. **Assigns how the event will be broadcast**: NONE (always active), VOX (audio activated), *C1-12, *ZM module (control trigger)
5. **Selects the output(s)** to which the signal will be routed.
6. Indicates **type of trigger**
7. Assigns which of up to 4 **events** are **contained in the BASE EVENT**. When the BASE Event is activated, these assigned ROUTE Events will come online simultaneously (Active for BASE EVENT only).
8. **Assigns a control output** to activate a relay when the event is broadcast.
9. Power On **assigns any EVENT to be the POWER ON default**. This usually a BASE Event. LAST status may also be selected for Power On.

h. Volume Settings Page (D-001T, D-001R, Mainframe Outs, T-001T)



1. Checking the box turns **Phantom Power** On/Off for individual Channels (D-001T Input only)
2. Adjusts the **Input Sensitivity** for each channel, from -10 (line level) to -60dB (mic level) (D-001T, D-001R Input only). Not available for other types of inputs. ⓘ
3. Adjusts **Bass & Treble** for each input (+/- 12dB) (D-001T, D-001R, Main Frame & T-001T outputs only)
4. Checking this box activates the **Loudness** function for each channel. This is useful for boosting background music played at lower volumes and affects mainly the bass range. (D-001T, D-001R, Main Frame & T-001T outputs only)
5. This number indicates the **fader's current dB Reference Level** (OFF, -70dB - +10dB) (D-001T, D-001R, Main Frame & T-001T outputs only)
6. **Fader Controls**. These may slide up or down to adjust the desired fader setting. The dB reference level (#5) will change accordingly).
7. **POWER ON** (MATRIX Mode): This setting (once uploaded to the 9000 unit) determines whether the fader adjustments will **SAVE** or **DELETE**, upon power OFF/ON cycle. This also requires that the **MEMORY** button be pressed on the unit.
8. An **ADJUST** function allows transmission of new settings to a serially connected 9000 unit. Making the assignment/level adjustment and clicking on this button is similar to making an adjustment on the front panel, but is being done remotely.
9. **CLOSE**. Closes the Volume Settings window.

ⓘ Please note: Many of these functions are present in both Input & Output fader pages. Some on Input page only. Volume Control ONLY is available for ZP-001T & 900 Series Input modules. AN-001T cannot be controlled from this page.

i. EQ Settings Page (D-001T, D-001R, Mainframe Outs, T-001T)



A 10-band parametric EQ, plus High-Pass Filter & Low-Pass Filters (12 filters total) are available for the following Inputs: (D-001T, D-001R, Mainframe, T-001T)

1. **EQ Curve Display.** Shows the overall curve and each EQ band's effect as it is adjusted.
 2. **Filter Type.** Selects from: PEQ, HPF, LPF or Through (default)
 3. **Frequency Adjust.** Selects the *peak* (PEQ-the frequency at which the filter exhibits the maximum cut or boost) or *corner* (HPF/LPF-the frequency at which the filter exhibits a 3dB drop in level) for each filter, depending on filter type.
 4. **Gain.** Adjusts the amount of *Boost* or *Cut* for the selected frequency (+/- 12dB range)
 5. **Q.** Varies the bandwidth and slope of the filter. This can be used to focus on a specific range (such as minimizing noise or hum at a particular frequency) or widened to affect a broader range (such as adding presence to the vocal range).
 6. **Filter Enable.** Checking this box activates the filter as part of the overall EQ set. If unchecked, the filter has no affect on the EQ curve. May be used as a filter "bypass" to compare effects on sound when IN or OUT.
 7. **ALL BYPASS.** Activating this button returns EQ to its default setting (ALL Through). ⓘ
 8. **Speaker EQ Presets (OUTPUT Channels only).** This selects the preset appropriate to the TOA speakers listed. This menu uses a number of the available EQ bands and does not display the EQ curve applied. ⓘ
 9. An **ADJUST** function allows transmission of new settings to a serially connected 9000 unit.
 10. **Saves** the currently displayed EQ curve to the currently active SCENE or global memory.
- ⓘ **Selecting this returns the EQ to its default (through setting). All EQ settings should be saved prior to activating this button or they will be lost. CLOSE will bring up the SAVE window prompting you to save (or discard) the new settings.**

j. Compressor Page (D-001T, D-001R, Mainframe, T-001T)

Setting Range OFF (default), 1, 2, 3, 4, 5)

- **1 Peak Limiter 1** (speech applications)

This protects amplifiers and speakers against damage caused by an excessive signal input.

- **2 Peak Limiter 2** (musical applications)

This protects amplifiers and speakers against damage caused by an excessive signal input.

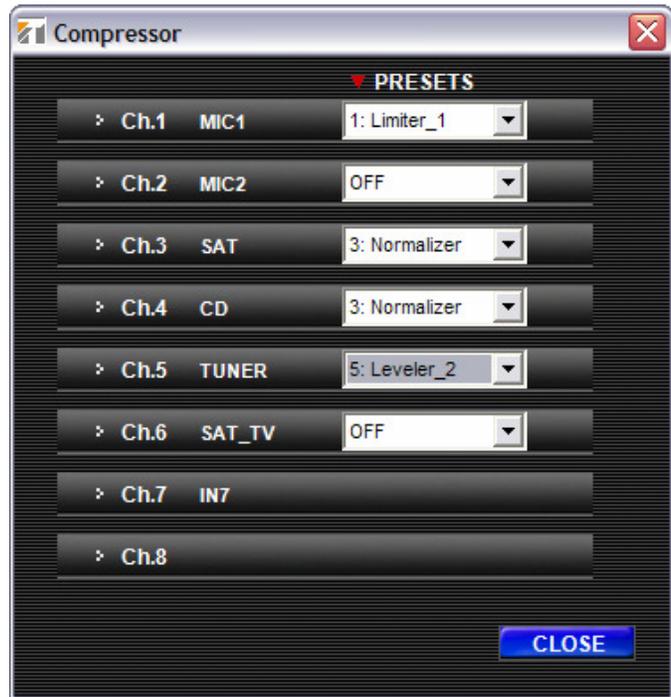
- **3 Sonic Normalizer** (BGM reproduction)

Equalizes the volume of Background Music by boosting quieter sounds and lowering louder sounds, making overall volume more uniform.

- **4 Leveler 1** (Speech applications)

Makes paging calls easier to hear by equalizing the difference in speech signal volume that may result from individual differences in speaker voice volumes or variations in speaker-to-microphone distances. **i**

- **5 Leveler 2** Similar characteristics to Setting #4, but is a more dramatic setting.

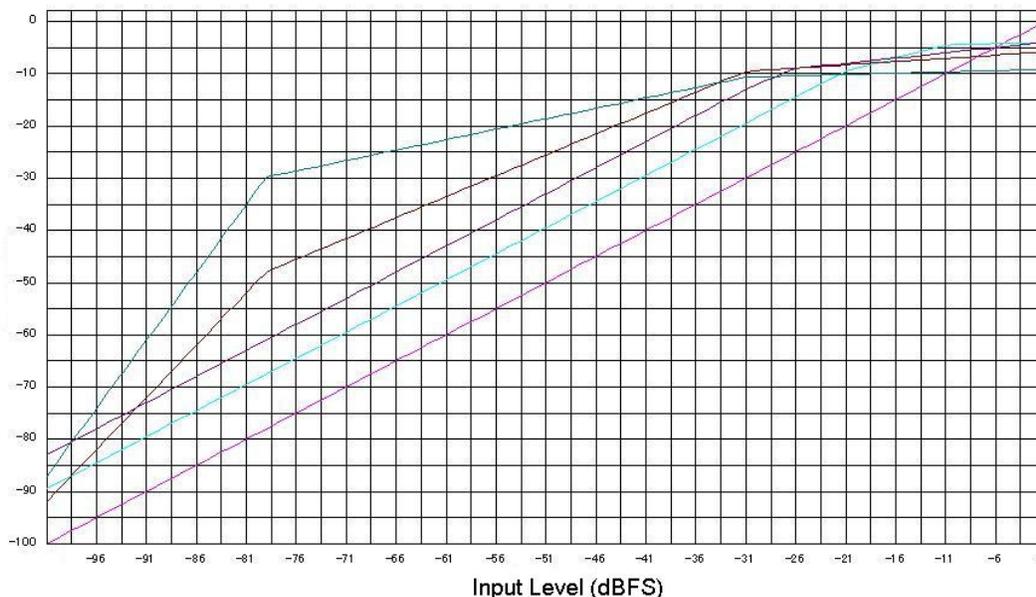


i This setting may make the mic more susceptible to feedback. Special care must be taken when installing microphones and speakers.

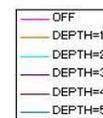
Compressor Preset Settings	Attack (Sec.)	Release (Sec.)	Offset1 (@Min IN, dB)	Ratio1 (Lower than T1, OUT/IN)	T1 (Threshold Level, dB)	Ratio2 (Btwn T1&T2, OUT/IN)	T2 (Threshold Level, dB)	Ratio3 (Higher than T2, OUT/IN)	Offset 2 (@Max IN dB)
1 (Peak limiter for Speech)	0.0001	0.1	10.5	1	-20	0.5	-10	0.05	-5.5
2 (Peak limiter for Music)	0.0001	1	10.5	1	-20	0.5	-10	0.05	-5.5
3 (Sonic normalizer for BGM)	0.0001	5	17	1	-30	0.8	-25	0.2	-16
4 (Speech leveler)	0.0001	0.1	18	2	-70	0.8	-38	0.125	-8.4
5 (Speech leveler)	0.0001	0.1	24.1	2.6	-70	0.4	-38	0.05	-4.7

Output Level (dBFS)

9000 Series Copressor Spec



Graph of Compressor Curves



k. Remote Settings Page (Mainframe)

① In MATRIX Mode: The LOAD BANK/EVENT setting cannot be accessed from this page. When an EVENT is programmed to be activated by a ZM controller in the EVENT Settings Page, that controller's status will then be indicated in the Remote Settings Page.

The Remote Settings Page allows programming for the controllers connected to the REMOTE 1 & REMOTE 2, 2-wire connections on the 9000 mainframe's rear panel. Two controllers of any type listed may be assigned.

1. **TYPE.** Selects the controller type from the drop-down list (see "Controlling the 9000" for more details on the controllers):
 - **Volume**-When a 10kOhm variable resistance potentiometer is used for volume control.
 - **ZM-9001:** When a ZM-9001 Zone Manager is used
 - **ZM-9002:** When a ZM-9002 Zone Manager is used
2. If a ZM 9001 or 9002 is selected, this window allows selection of the following items to be controlled by the contact buttons:
 - **LOAD BANK**- assigns the button to select one of the 32 preset memories (SCENE or EVENT**)
 - **VOLUME UP**-Sets that button to control a volume up function
 - **VOLUME DOWN**- Sets that button to control a volume down function
3. If **LOAD BANK** is selected in # 2, then this **selects one of the 32 preset Scene** memories to be loaded.
4. If a **VOLUME** or **ZM-9002** controller is selected, then a box appears allowing selection of an input or output channel to be controlled.
5. If **Volume UP** or **DOWN** is selected for **ZM controller buttons in #2**, these set the **In/Out channel #** to be controlled, as well as the dB increment for each button press.

I. Control In Settings Page (Mainframe, C-001T)

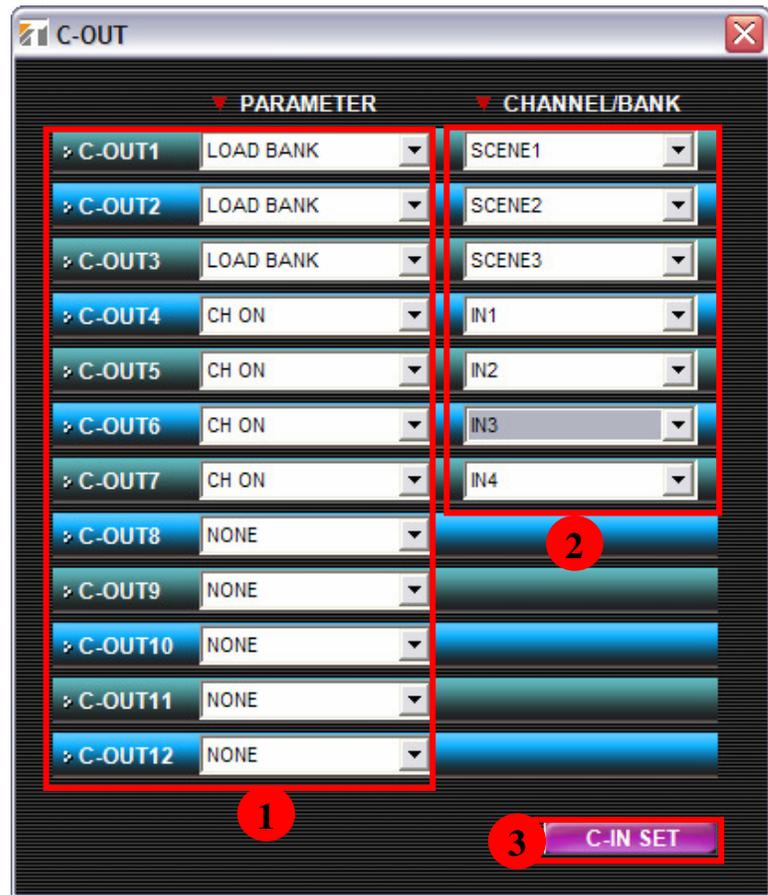


The **CONTROL IN** Settings Page allows programming for the Contact Controllers connected to the Contact IN 1-4, 2-wire connections on the 9000 mainframe's rear panel & the 5-12 Inputs on the C-001T. A custom dry contact switch or a ZM-9003 controller may be assigned to the following functions:

1. **Parameter** Selects the control function assigned to that contact:
 - **LOAD BANK** (MIXER Mode): Loads the selected preset SCENE memory
 - **EVENT** (MATRIX Mode): Activates an EVENT broadcast.
 - **VOLUME UP**: Incrementally controls the upward volume
 - **VOLUME DOWN**: Incrementally controls the downward volume
 - **POWER**: Powers up the 9000 unit from STANDBY operation.
 - **MUTE**: Mutes the assigned INPUT or OUTPUT
 - **EMERGENCY MUTE**: MUTES ALL AUDIO
 - **BGM END** (MATRIX-BGM/PAGE Sub mode): Ends all BGM source broadcasts.
 - **CHANNEL ON** (MIXER Mode): Turns ON the assigned INPUT or OUTPUT
2. Selects the **Preset Memory** or **Channel #** if Volume, LOAD BANK, MUTE or CHANNEL ON is selected in #1.
3. Sets the **dB steps** for volume if VOLUME UP/DOWN is selected in #1.
4. Activates a Controller Output (1-12) to be sent simultaneously with activation of that Control IN. This function may be used to facilitate triggering various coordinated events, such as emergency lighting, announcements, cameras, access control, etc...
5. A direct link to the **CONTROL OUT** settings Page.

ⓘ In MATRIX Mode: The EVENT setting cannot be accessed from this page. When an EVENT is programmed to be activated by a Contact Input in the EVENT Settings Page, that status will then be indicated in the Remote Settings Page.

m. Control Out Settings Page (Mainframe, C-001T)



The **CONTROL OUT** Settings Page allows programming for the Contact Controllers connected to the Contact OUT 1-4 on the 9000 mainframe's rear panel & the 5-12 Outputs on the C-001T. These may be used to control additional 9000 units or other devices which operate using contact closures.

1. **Parameter** Selects the control function assigned to that contact:
 - **POWER:** (both modes) Sends an active relay signal to that control output when the 9000 unit is powered ON
 - **LOAD BANK** (MIXER Mode): Sends an active relay signal to that control output when the assigned preset SCENE memory is loaded
 - **CHANNEL ON** (MIXER Mode): Sends an active relay signal to that control output when the assigned channel is turned ON
2. Selects the **Preset Memory** or **Channel #** if Volume, LOAD BANK, MUTE or CHANNEL ON is selected in #1.
3. A direct link to the **CONTROL IN** settings Page.

5. Programming from Excel

The 9000 Series may also be programmed using a simple MS Excel™ spreadsheet. These templates are available for download from the website www.toa.co.uk and are also included on the CD-ROM supplied with the 9000.

- Template includes drop-down lists and autoformating, making it easy to find settings and copy functions from one cell to others.

- It also provides table formatted print-out, so that field technicians may have easy access to a parameter reference “map”.

Two template versions are available:

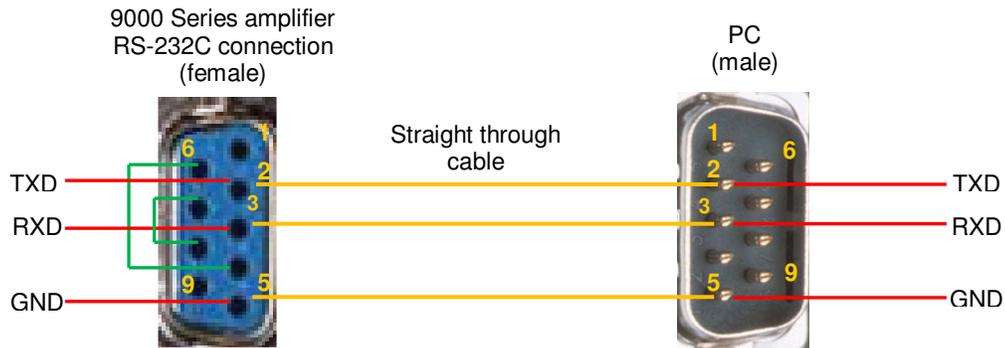
- One for **MATRIX** Mode, including sheets for:
 - Basic Setup, Input settings, Output Settings, Event Settings, Utility Settings, Keylock settings.
- One for **MIXER** Mode, including sheets for:
 - **General Settings** (Module assignments, I/O/Scene naming, Control/Remote assignments, Paging settings, AN setup, NOM settings & Keylock/Password settings) & **Scenes 1-32** (I/O settings for 1-8 and Paging Group assignments)
- These templates may also be imported or exported to binary format, which can then be loaded into the GUI software. It’s then possible to program in one format and then transfer and edit in another.

	A	B	C	D	E	F	G	H	I	J
1	9000 SERIES MIXER MODE		IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8
2	VOL. LEVEL		0.0 dB	0.0 dB	0.0 dB	0.0 dB			0.0 dB	
3	NOM	ON/OFF	OFF	OFF	OFF	OFF				
4	PHANTOM POWER		OFF	OFF	OFF	OFF				
5	SENSITIVITY		-10 dB	-10 dB	-10 dB	-10 dB				
6	TONE	BASS	0	0	0	0				
7		TREBLE	0	0	0	0				
8	LOUDNESS		OFF	OFF	OFF	OFF				
9	EQ 1~10	ON/OFF	ON	ON	ON	ON				
10	EQ 1	GAIN	0 dB	0 dB	0 dB	0 dB				
11		Q	1.5	1.5	1.5	1.5				
12		FREQ.	31.5Hz	31.5Hz	31.5Hz	31.5Hz				
13	EQ 2	GAIN	0 dB	0 dB	0 dB	0 dB				
14		Q	1.5	1.5	1.5	1.5				
15		FREQ.	63Hz	63Hz	63Hz	63Hz				
16	EQ 3	GAIN	0 dB	0 dB	0 dB	0 dB				
17		Q	1.5	1.5	1.5	1.5				
18		FREQ.	125Hz	125Hz	125Hz	125Hz				
19	EQ 4	GAIN	0 dB	0 dB	0 dB	0 dB				
20		Q	1.5	1.5	1.5	1.5				
21		FREQ.	250Hz	250Hz	250Hz	250Hz				
22	EQ 5	GAIN	0 dB	0 dB	0 dB	0 dB				
23		Q	1.5	1.5	1.5	1.5				
24		FREQ.	500Hz	500Hz	500Hz	500Hz				
25	EQ 6	GAIN	0 dB	0 dB	0 dB	0 dB				
26		Q	1.5	1.5	1.5	1.5				
27		FREQ.	1KHz	1KHz	1KHz	1KHz				
28	EQ 7	GAIN	0 dB	0 dB	0 dB	0 dB				
29		Q	1.5	1.5	1.5	1.5				
30		FREQ.	2KHz	2KHz	2KHz	2KHz				

ⓘ Requires 9000 firmware v2.0 or higher

6. Communication with a PC

a. How do I connect a 9000 Series unit to a PC?



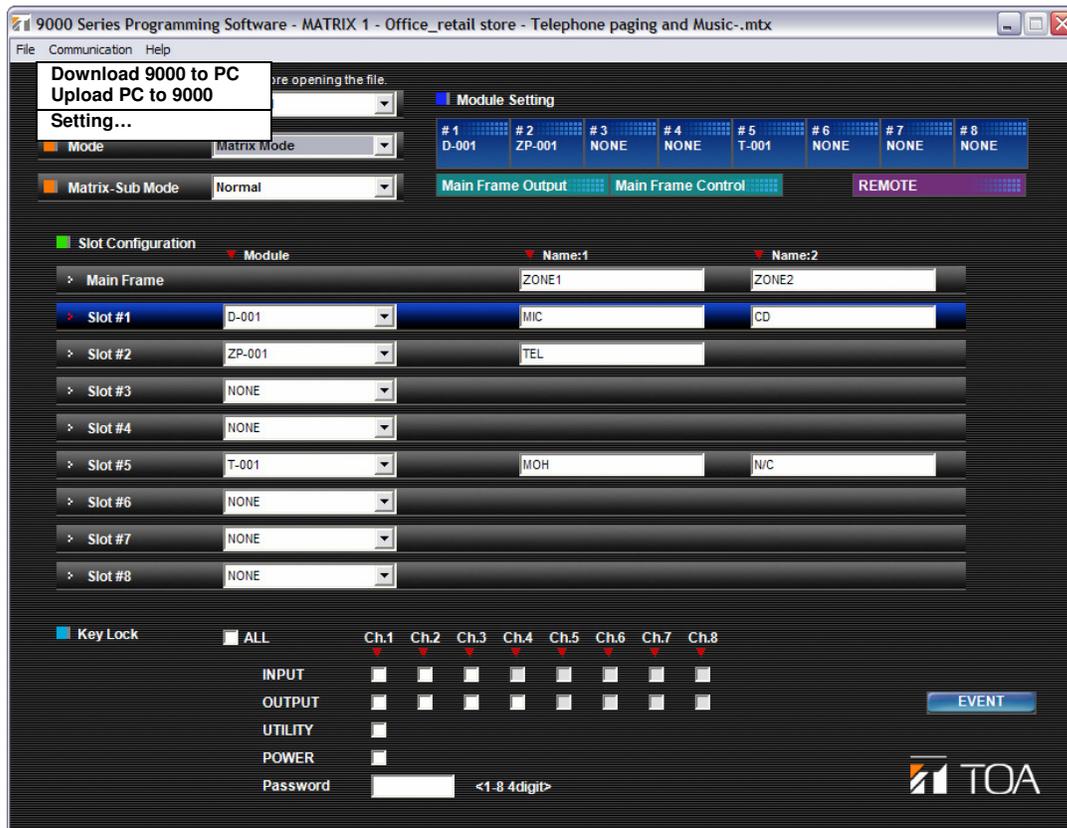
Use a straight-through 9-pin serial cable Male-Female for PC connection. If your PC does not have a serial port (only USB), a third-party USB >Serial adapter should work. However, you may need to check a few, as not all will function properly. A USB> Serial adapter sold by Radio Shack has been reported to work reliably.

b. How do I Upload/Download Configuration presets?

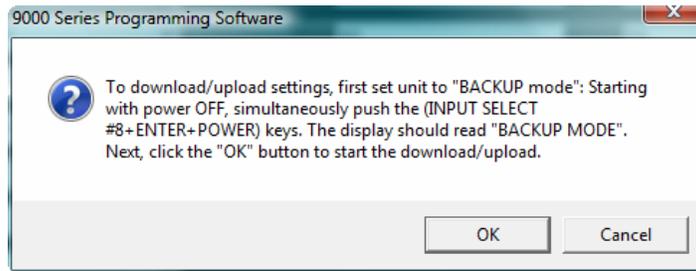
First, assure that your PC is connected to the 9000 unit via the appropriate 9-pin serial cable

For Upload:

- From the “Communication” menu Select “UPLOAD PC TO 9000”



- A pop-up menu will appear:



- This asks you to place the 9000 unit BACK-UP mode.
- To enter BACKUP MODE- From power off, press and hold INPUT 8, ENTER & POWER buttons on the 9000 unit's front panel simultaneously.



- The 9000 display then reads: "BACKUP MODE".
- Press "OK" on the menu.
- The PC begins to upload the currently loaded configuration template to the 9000 unit.
- When this occurs, all other settings in the 9000 unit's memory are erased.
- Also, before uploading, make sure the 9000 unit is set the same mode (MATRIX or MIXER) as the configuration you are trying to load.
- It may be necessary to adjust your serial port # and baud rate to effect proper serial communication with your PC. You can find these under the "Communication> Setting" menu. The default for this is Port 1, speed 57,600 baud.

For Download:

Essentially, the same process, except that you will select "DOWNLOAD 9000 TO PC" from the "COMMUNICATIONS" menu. You will receive the same prompt and set up the 9000 for BACKUP mode as before. All memory and configuration data currently in the 9000 unit will download to your PC and be saved to a designated file as either an .mtx (matrix) or .mix (mixer) file.

In either procedure, all 32 presets, as well as global settings are stored to the unit or the PC.

c. What to do if I've forgotten my security password?

Not to worry. We've provided a back door to getting into the front panel. When you encounter an "ENTER PASSWORD" screen, implement the following button push:

PRESS and HOLD "INPUT 1", then press the "ESC/BACK" key and the "▲" arrow key simultaneously. This will allow security access to menu functions which had been locked out.



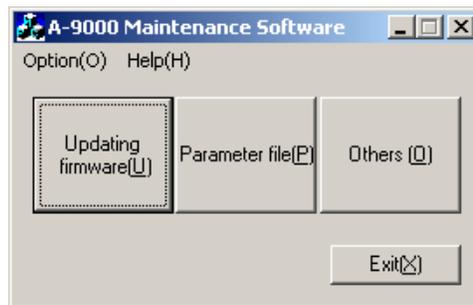
d. How do I update the firmware on the 9000 unit?

First you should check your unit's current firmware version in the UTILITY menu under "Version".

1. Updated 9000 Series firmware (available at <http://www.toa.co.uk>)
2. You will be instructed to save the firmware to your desktop as a .mot file.
3. Connect your 9000 unit to a Windows PC via the appropriate serial cable.
4. From a power off state, Place the 9000 unit in "UPDATE MODE" (press & hold the following keys in the indicated order: CH 8 / ESC/BACK / POWER



5. Open the 9000 Maintenance Software (available on your 9000 install disk or on the web).



6. Click "Updating firmware".
7. Follow the screen prompts.
8. When this process is completed, the unit will power down. Upon power-up, it will confirm new firmware rev on the display. This may also be viewed in the UTILITY MENU under "VERSION" (See chapter 8 – C)

7. Controlling the 9000 Series

There are several ways of controlling the 9000 Series:

1. Front panel
2. Remote Control (Volume Pot, ZM-9001, ZM-9002)
3. Contact Closure (ZM-9003, remote contacts)
4. Serial Control (PC, third-party control system)

a. How do I control the 9000 Series from the front panel?

All control of the 9000 Series may be accessed on the front panel. While this is a useful option (for lack of any external control), it should be noted that control via remote or serial connection is more convenient. Front panel control is limited to Memory Recall & Volume functions.

b. How do I control the 9000 Series using Remote Control inputs?

Using the two Remote Input 2-wire terminals on the 9000 Mainframe: (ZM-9001, ZM-9002, Volume pot).



ZM-9001: This controller operates on one of the 2 two-wire remote inputs on the 9000 Series' back panel. This version provides 6 assignable contact closure-type buttons, which may be programmed to control memory selection or volume up/volume down (incrementally) for any input or input channel. The assignments for this control may be found in the REMOTE programming page in the GUI or the unit's UTILITY menu.



ZM-9002: This controller also operates on one of the 2 two-wire remote inputs on the 9000 Series' back panel. This version provides 4 assignable contact closure-type buttons, which may be programmed to control memory selection or volume up/volume down (incrementally) for any input or output channel. It also features a continuously variable knob, which may be assigned to control volume. The assignments for this control may be found in the REMOTE programming page in the GUI or the unit's UTILITY menu.



10K Ω pot: Works with either of the 2 two-wire remote inputs and may be chosen in lieu of the ZM controllers, when only a simple volume control is required. The assignments for this control may be found in the REMOTE programming page in the GUI or the 9000 unit's UTILITY menu.

c. How do I control the 9000 Series using Serial Control?

The 9000 Series may be controlled using the 9-pin (RS-232C) serial connection on the rear panel. There are two ways in which this may be implemented:

1. Via a third party controller: AMX, Crestron, etc. RS-232C protocols are available on our website for those who wish to program their own drivers for the 9000 Series. AMX &

Crestron currently support the 9000 Series and control modules are available directly from the manufacturers.

http://www.toaelectronics.com/downloads/9000_series/TOA_9000_RS232C_Protocol_v312.pdf

- Using a Windows PC and either the 9000 Series software or the Maintenance software (Virtual Control - *see below). Using the 9000 Series Software provides only limited control access. Certain GUI pages offer an "ADJUST" function, which when connected to a 9000unit via a serial cable provides an audition function. That is, when an adjustment has been made, clicking the ADJUST button on the GUI changes the parameter on the unit to that displayed value. This will not be stored in the unit unless the memory save function is used, or the new setting is saved to a template and then uploaded to the 9000 unit.

d. How do I control the 9000 Series using Contact Closures?



ZM-9003: The ZM-9003 controller works with the contact closure inputs on the 9000 Series back panel and/or on the C-001T module. It provides a total of 6 buttons-4 locking with label strips (ideal for event/scene memory or BGM source select) and two momentary buttons. These use individual contact (plus a common GROUND) for each of the contact outputs. These may be spilt on the 4 contact INPUTS located on the 9000 back panel and those on the C-001T. Because the E (ground) on both of these is internally tied to chassis ground, the E connection on either section may be used.

The programming for this may be found in the **MAIN FRAME CONTROL** section of the **GUI** or the **CONTROL IN** page in the **UTILITY** menu.

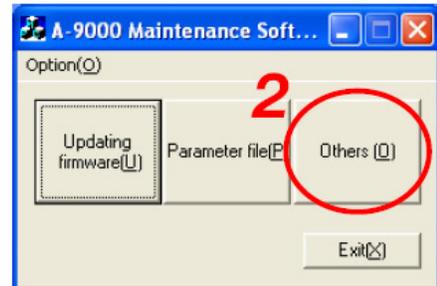
You may also use a custom-built contact switch or panel for the Control Ins

e. How can I check contact closure functions if I don't have switches?

You can simulate the unit's control input activation through PC operation.

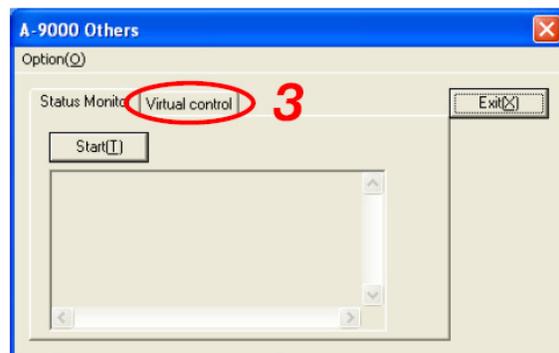
- Step 1.** Double-click the "MaintCtrl.exe" icon to run the 9000 series maintenance software.

The screen at right is displayed.



- Step 2.** Click the "Others" button.

The window at right opens.

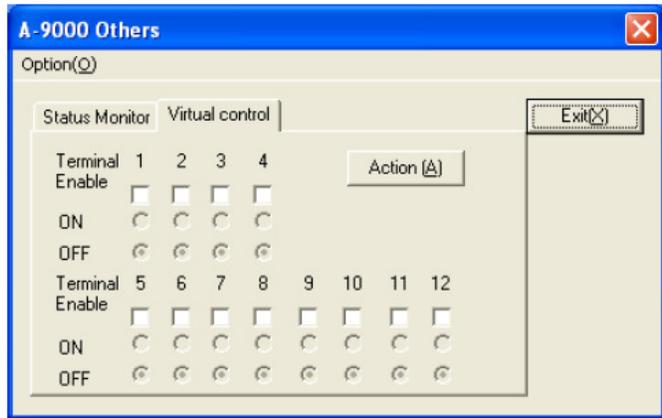


- Step 3.** Click the "Virtual control" tab.

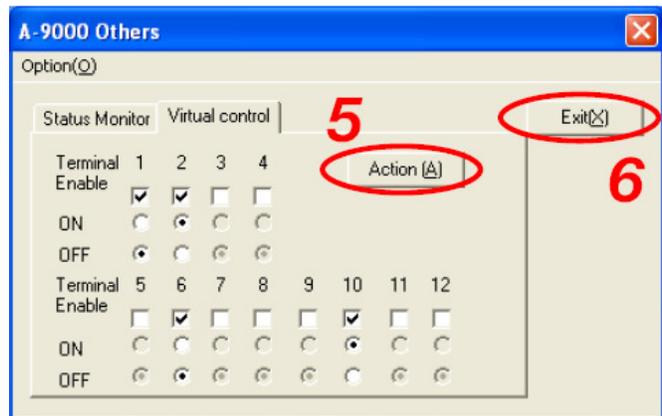
The window at right opens.

Terminal 1 – 12 represent the control input terminal numbers.

Step 4. Tick the "Enable" boxes of the control inputs you want to activate, then select either ON or OFF.



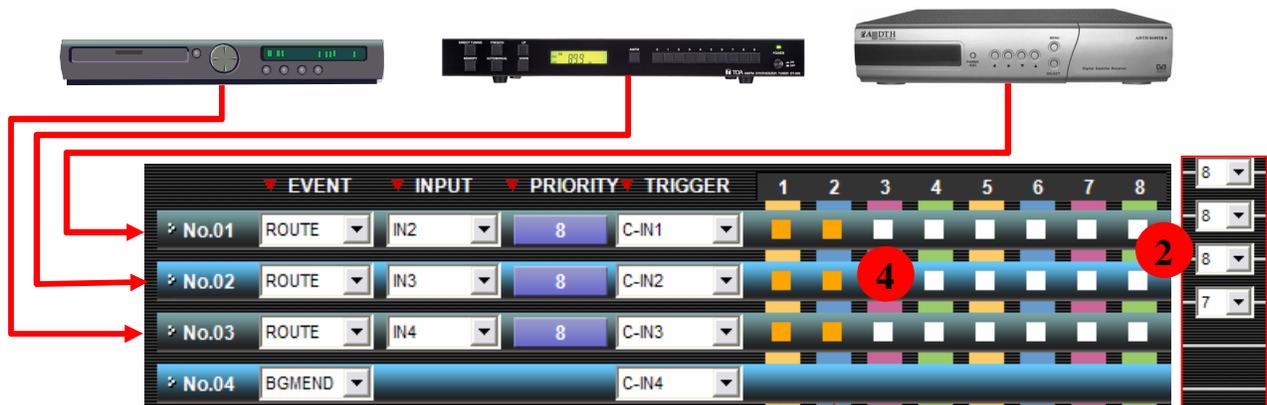
Step 5. Click the "Action" button.
The Control inputs set to ON are activated.



Step 6. Click the "Exit" button to terminate the program.
The screen returns to the initial menu screen in Step 1.

f. How do I set up a ZM control to be used as a BGM Source selector? (MATRIX Mode)

1. **ZM-9003*** (Contact IN 1-4) used to trigger BGM sources:
CD Player FM Tuner Satellite Receiver



- 2. Priority set to 8 for all BGM sources.
- 3. Paging Mode set to LIFO.
- 4. All inputs assigned to same Outputs
- 5. Each selected BGM source overrides the previous one.



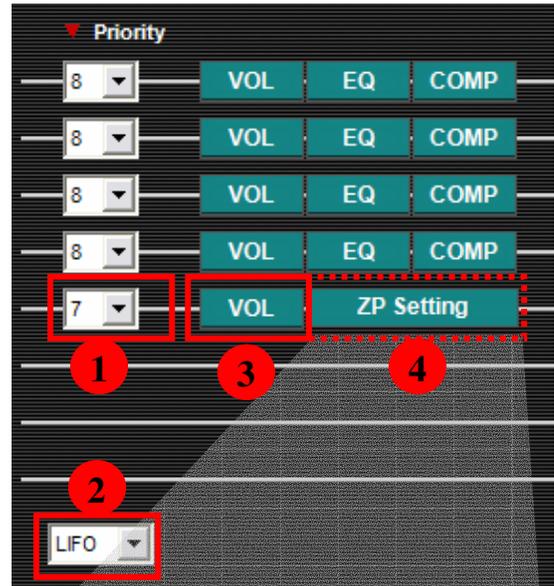
1 * ZM 9001/9002 Modules may also be used for this function. Assign ZM IN instead.

8. Paging with the ZP-001T

a. How do I perform paging using the ZP-001T in Matrix (Normal) Mode?

Once you configure the I/O settings for ZP-001T as the paging source (in this example –SLOT 3/Input 5), you should then:

1. Set the priority for the ZP input as 7 or higher (above the BGM sources).
2. Priority output should be set to LIFO, unless there is another paging source, such as a microphone, which shares the same output and priority level.
3. Clicking on the volume calls up the Volume Settings page. The fader adjustment for the ZP module output will appear here and may be adjusted as needed.
4. Clicking on the ZP SETTING box calls up the ZP window. This page allows you to select the type of phone exchange interface you will connect to the module:

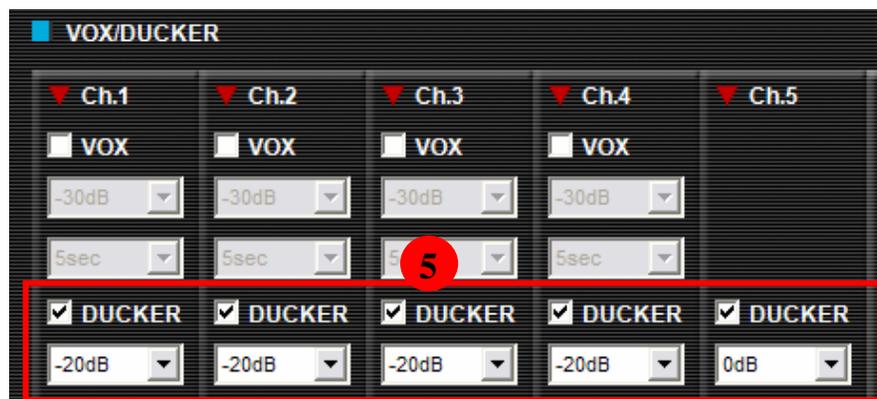


- a. **PAGING PORT**-an analog 2-wire port found on many phone system exchanges. This also requires a dry contact to activate the page.
- b. **RING SIGNAL**- An extension output from the phone exchange (typical RJ-11 modular connection-this is for *analog* extension ONLY-NOT compatible with digital signals). Both of these must support **DTMF** dialing protocols to operate properly (please check the specifications for the exchange)
- c. **Pre-Announced Tone**-selects whether a “chime” precedes the page when activated.



5. **Ducking**-The ducking circuit must be activated for both the paging source (ZP) and the sources which must be attenuated /muted when the page is activated. **VOX is not possible for ZP paging in this mode.**

① The page outputs from the ZP module do not need to be programmed in the Event page. It is pre-programmed to activate (by either ring tone or paging contact) any outputs which are dialed on the phone extension.



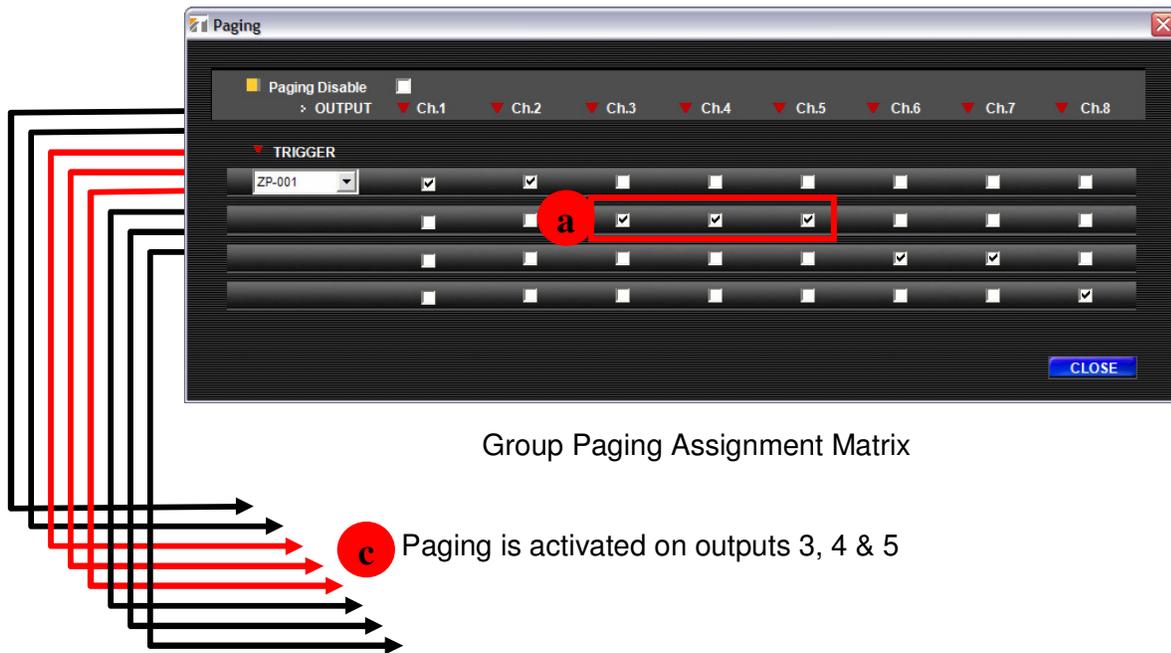
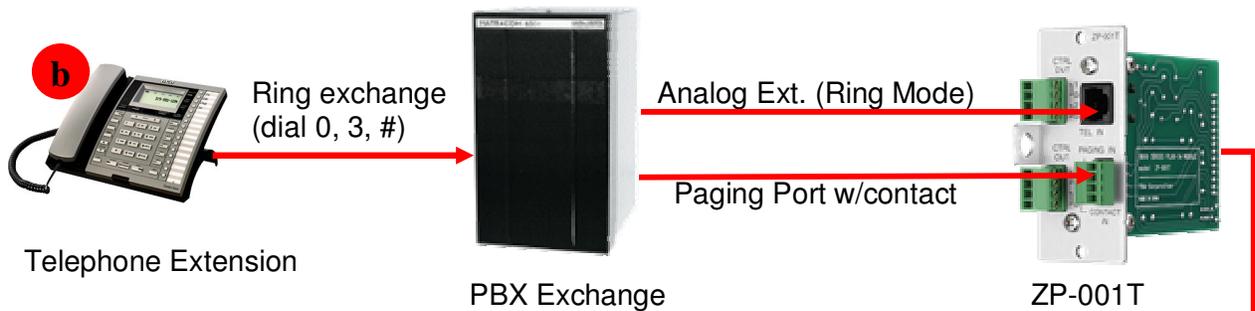
b. How do I perform paging using the ZP-001T in Mixer Mode?

The ZP-001T paging functions works very similarly to the Matrix mode, except that the routing must be set up in the Output Assignment Page.

1. The ZP-001T should be assigned to all outputs where the paging signal needs to appear.
2. The Group Paging assignment should also be set to allow the page to affect different output groups as needed (see diagram below).
3. When any output is dialed from the phone extension all outputs which are set as part of that group will also receive the page.

Example:

- a. Program Page Group 2= Outputs 3, 4 & 5.
- b. Dial output 3 (0, 3, #) on the extension phone.
- c. Outputs 4 & 5 also receive the page.



*Paging during power-OFF

The power switch located on the amplifier front panel is a soft-switch, and not a mechanical switch and does *NOT* turn the power supply's primary side on or off. Therefore, there is enough internal power to maintain an active microprocessor inside the unit, even if the power switch is set to OFF.

The following controls can be performed when the power is OFF:

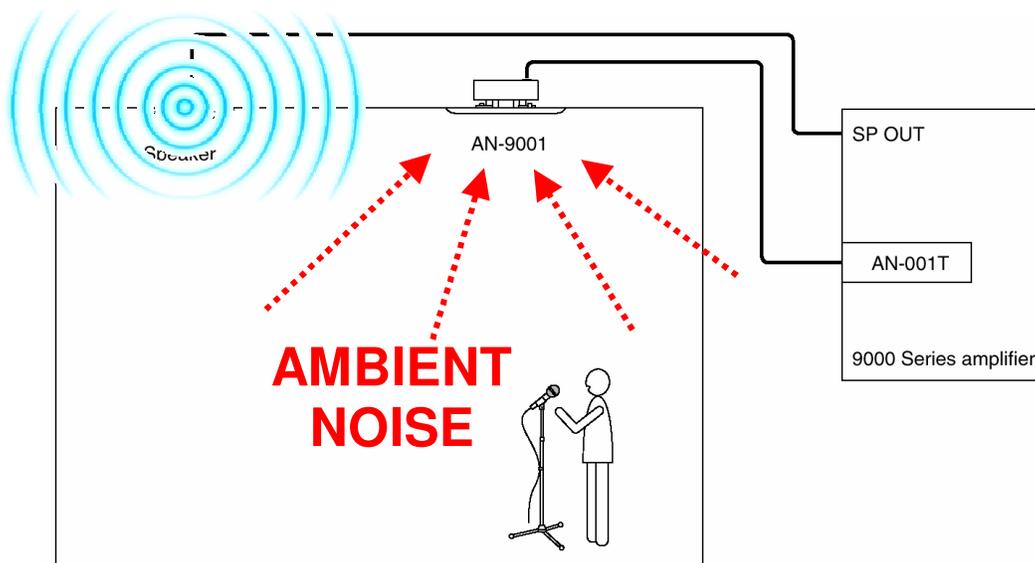
- Remote power control by control input: Power can be switched on and off using the external contact.
- Event activation by control input: Turns on the unit's power and activates the assigned Event (Trigger-set Event having the input with Priority 1 – 7) using the external contact. The unit returns to power-OFF state after Event operation completion.
- Paging by the ZP-001T turns on the unit's power. The unit returns to power-OFF state after paging completion.

9. Ambient Noise Control Using the AN-001T

a. How does the AN-001T work to compensate for ambient noise?

The **AN-001T** allows the 9000 to automatically adjust the level of Background Music in response to a change in level of ambient noise in the environment.

- It does this by way of a sensing microphone (AN-9001), placed in the ceiling or wall and calibrated to sense the room's ambient noise level (done automatically on power up).
- When the noise increases to a preset threshold level, for a specified time window, the AN-001T's sensing circuit can adjust the output level of background music by a predetermined ratio (see graph below).
- Two AN-001T modules may be installed in the 9000 frame (see "Hardware Configuration") and a total of 4 AN-9001 sensing microphones may be deployed to sense the ambient noise in independent zones or spread over a large single zone to achieve better coverage.
- Each AN-001T channel may then be assigned to control the level of different outputs.



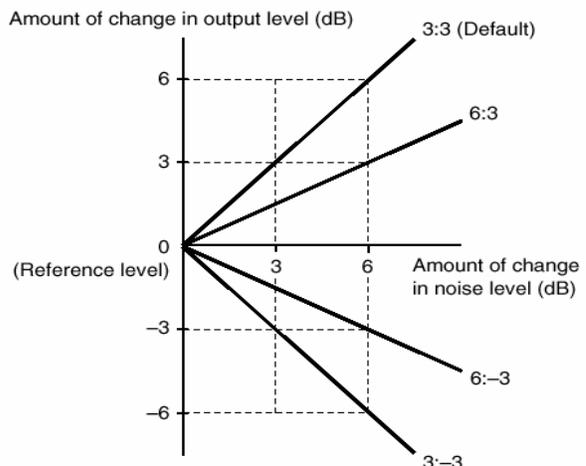
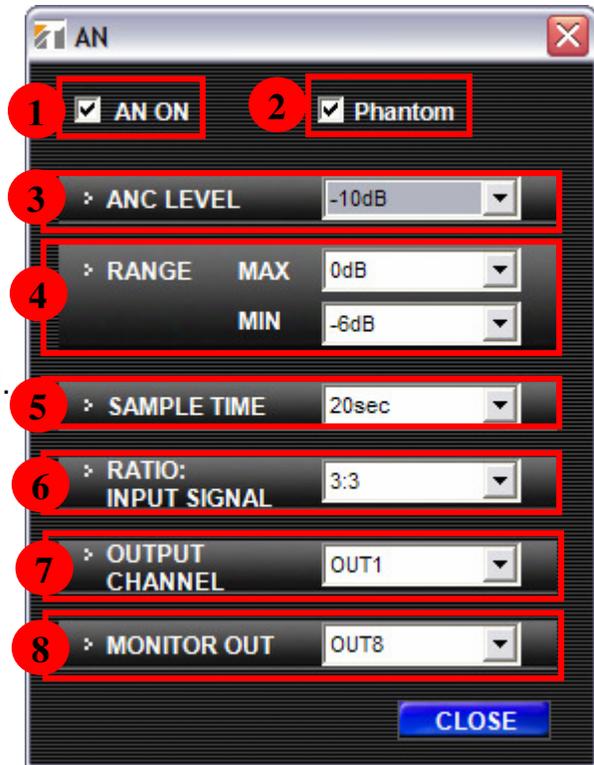
ⓘ Despite the effectiveness of this function, it is not flawless. Sensing microphones placed too close to a speaker may cause the mic to interpret the speaker's output as additional noise and will trigger a volume change. To help avoid this, care should be taken with respect to mic vs. speaker placement, especially in larger open spaces. Some experimentation will likely be necessary to find the optimum placement.

AN-001T settings are saved with the preset Scene or Matrix template. However, ambient noise sense levels will be lost when switching scenes or powering the unit OFF/ON. The AN sensing will need to recalibrate to the current environment when the unit again becomes active after memory change or power up.

b. What settings should I use for the AN-001T?

It should help to explain what each setting does and then how to apply it:

1. **AN ON**- Turn the AN-001T sensing function on for that channel. **Note:** Each AN-001T incorporates 2 channels of ANC processing
2. **PHANTOM**: Turns on a 24VDC phantom power supply required by the AN-9001. While other (non-phantom) mics may be used for this function, the AN-9001 is optimized to perform with this module.
3. **ANC LEVEL**: Sets the noise sensing threshold. This is the level at which the AN circuit reponds to the incoming noise. This should be at or above the level of background music.
4. **RANGE: MAX**-Sets the maximum level which the AN circuit can adjust to. **MIN**- Sets the minimum level the AN circuit will adjust to. This function acts somewhat like a “LIMITER” prevent the output from becoming too loud or too low.
5. **SAMPLE TIME**: Sets the minimum amount of time the ambient noise level must exceed the sensing threshold in order for the AN circuit to have any effect. This is used to prevent “false” triggering by intermittent or transient sounds, such as a brief loud noise or someone shouting.
6. **RATIO: INPUT SIGNAL**: Sets the ratio for the number of dB of input (noise) and the resulting change in dB of output.
 - a. For example: A 3:3 ratio (default setting) means that for every 3 dB of noise input increase, the output level of the background Music is increased by 3 dB.
 - b. A negative ratio may also be chosen. This has the effect of decreasing the output level in response to an increase in noise level. A restaurant or nightclub owner may decide that, if the conversation at the bar is getting louder, he does not want the background music to compete with it (since after all, conversation is what being at the bar is all about). Therefore the music level is automatically lowered rather than raised.
7. **OUTPUT CHANNEL**: Set the output channel to be controlled by that channel of the AN-001T. As previously mentioned, several AN channels may be set to control different output channel levels.
8. **MONITOR OUTPUT**: An unused Line Output on the 9000 may be assigned as a monitor to say, a security office speaker. While the audio picked up by the sensing mic is not meant to be fed through the speakers, it may serve to allow security guards to “listen in” unauthorized activity.



10. NOM Function (Automatic Mixing-MIXER Mode)

a. How do I program the 9000 for Auto-Mixing?

The 9000 Series Auto Mixing function is simple, but very effective. This is used for conference rooms, court rooms and other live venues and is designed to minimize two problems associated with multiple microphone applications:

1. Sensitivity to feedback, due to increased system gain as microphones become active
2. Cross-talk from mic-to-mic, which can also not only increase feedback, but decreases intelligibility.

The Auto Mixing function helps to overcome these problems by employing two stages of mixing control:

1. **Gating:** This keeps crosstalk to a minimum by turning off microphones that are not used at a given time. When a speaker begins speaking into the microphone (above the threshold level), the gate opens to allow audio to pass through. When the speaker stops, the gate closes again to maintain a quieter background.
2. **NOM (Number of Open Microphones).** This process works on the principal that for every time the number of live or “open” microphones is doubled, the overall volume increases by 6dB. Therefore, we would need to reduce the system’s level by 6dB in order to maintain a consistent volume and prevent feedback. The NOM calculation is a logarithmic function represented as: $x\log\text{NOM}$ (with x being the attenuation factor). A value of $10\log\text{NOM}$ will reduce the system level by 3dB for every doubling of open mics. A value of $20\log\text{NOM}$ will reduce the level by 6dB. Then, if we go from 4 live microphones to 8, a setting of 20 would automatically reduce the system by 6dB-maintaining the correct level.

We will find these settings in the **I/O Configuration Page:**

	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8
1	<input checked="" type="checkbox"/> GATE							
2	-30dB							
3	5sec							
	<input type="checkbox"/> DUCKER							
	-20dB							
	PRI 1							
4	<input checked="" type="checkbox"/> NOM							
5	20	20	20	20	20	20	20	20

1. **GATE:** Checking this box activates the Gate function for each microphone.
2. **GATE THRESHOLD:** Sets the level which the input must exceed in order to “open” the Gate (-5 to -40dB range).
3. **GATE RELEASE TIME:** The time it takes for the Gate to close again once input signal has dropped below the threshold.
4. **NOM-** Activates the NOM attenuation functions for the selected mics.
5. **NOM ATTENUATION:** Sets the attenuation rate for the NOM function (1-20). A setting changed for one microphone affects all mics for which NOM has been activated. A setting of 20 provides the maximum attenuation, with 1 being the minimum. (*See NOM Table in the **Chapter 13- Misc.**).

11. Matrix Sub-Modes

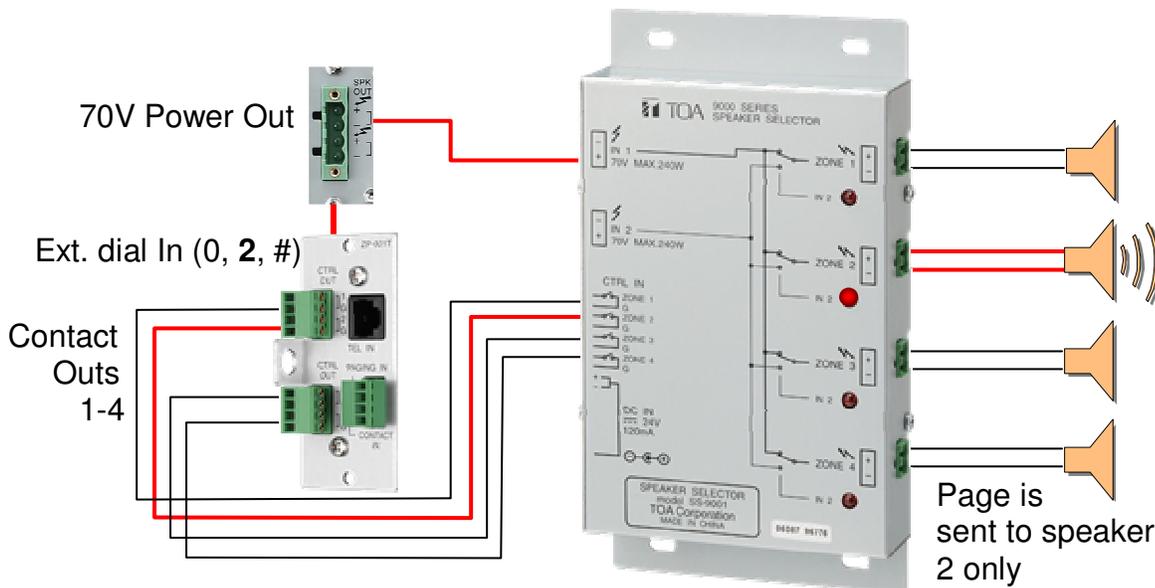
a. What are the Matrix Sub-Modes used for?

Matrix sub-modes are designed to allow the ZP-001T module to trigger pages to separate speakers even though the amplifier is only configured for a one or two channel output (no T-001T cards installed). This function also requires the SS-9001 speaker selector. There are two modes that work this way—one for a single power output and one to be used when two channels are available. Here is how they function:

1) Normal mode: Works when the 9000 is configured with additional output modules and paging may be assigned to multiple zones.

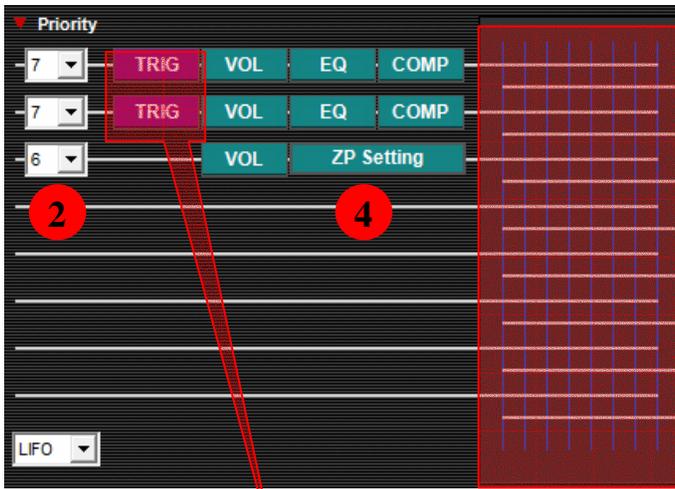
2) Sub-Modes: (1 or 2 outputs only with SS-9001 speaker selector)

a. **SINGLE** is for when only **one** output is used (A-9060S, A-9120S, A-9240SH).



The relay for **speaker output 2** is closed and the page is received from that output.

1. The **ZP OUT** assign window allows assignment of paging sources only. This is for sources other than the ZP-001T (i.e. microphones into a D-001T). However, a ZP-001T module **MUST** be installed for these to function, since the trigger outputs are on this module.
2. **BGM Sources may not be used in this mode.** Make sure the input priority is set to 7 or higher (1-7). Priority 8 is always considered a BGM source and since BGM cannot be used in the mode, these will not assignable in the ZP OUT page.
3. Checking a box assigns that input source to switch the speaker output (1-4) to ON when that page is activated. Otherwise, speaker outputs are normally OFF.
4. When the ZP-001T module is used as a page source (as opposed to a VOX or Control input source) no assignments are necessary. The ZP will switch the speaker output by way of its contact outputs. The ZP may be set to a different priority than the other paging sources. If the same priority, priority mode (FIFO, LIFO, MIX) will be active (see below)



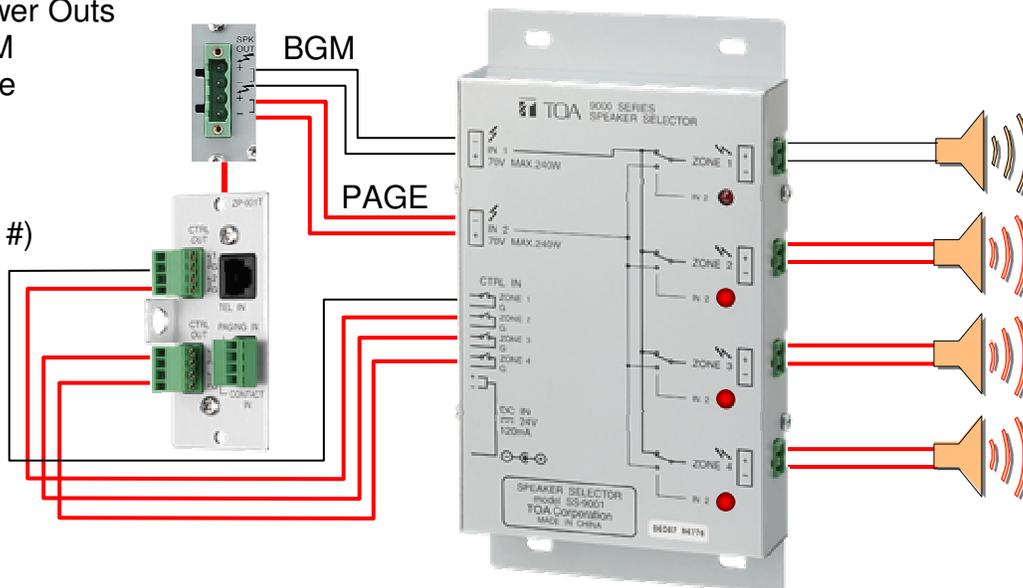
In this example, Inputs 1 & 2 are both priority 7 mic paging sources set to activate on contact closures. In the ZP OUT box, they are assigned so that input 1 activates the page in speaker outputs 1 & 2 and Input 2 activates the page in speaker outputs 3 & 4. The ZP module input is set to priority 6, which will override Inputs 1 & 2. Since Inputs 1 & 2 are both priority 7, the LIFO function will affect which is one output.



b. BGM/PAGE: Used when the 9000 is NOT configured with additional outputs and only the *two* Mainframe outputs are being used. One for BGM & one for PAGE

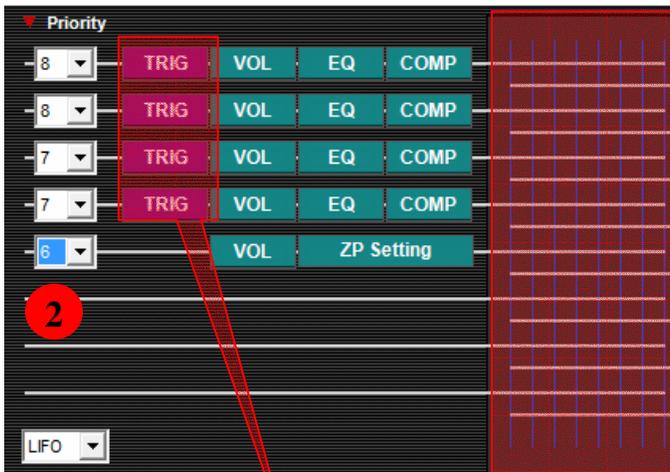
2-70V power Outs
CH 1-BGM
CH 2-Page

Ext dial-in
(0, 2, 3, 4, #)
Triggers
speaker
relays on
SS-9001

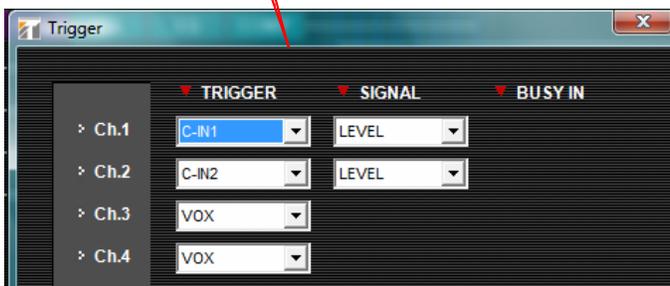


Example: All outputs receiving BGM source, until the relays for *speaker outputs 2, 3 & 4* are switched and only these outputs receive the PAGE, while output 1 continues to receive the BGM source.

1. BGM sources MAY be used in this mode. However, they are not assignable in the ZP OUT page and are always output from channel 1 on the 9000 Series unit.
2. All other functions for Page and ZP input work as in the Single mode.



In this example Inputs 1 & 2 are BGM sources (priority 8). Separate trigger inputs may be used to select each source (Event select with LIFO mode). These are automatically assigned to output on Channel 1 of the 9000 mainframe and are not assignable in the ZP OUT page. Inputs 3 & 4 are priority 7 mic paging sources set to activate from VOX input. In the ZP OUT box, they are assigned to activate the page in speaker outputs 1, 2 & 3.



Their signals will automatically be output to channel 2 on the 9000 Series unit. The ZP module input is set to priority 6, which will override Inputs 3 & 4. Since Inputs 3 & 4 are both priority 7, the LIFO function will affect which one is output. In any case, the Page or ZP input will switch the selected speaker outputs on the SS-9001 from the BGM source to the PAGE source.

ⓘ The VOX trigger in the DUCKER settings should be ignored in this mode, since this is set from the input trigger in the “TRIGGER” page.

12. Miscellaneous Stuff

a. How do I troubleshoot the 9000 Series?

Symptom	Possible Cause	Remedy
Noise generated.	Module mounting screw not securely tightened.	If this screw is loose, noise may be produced. Ensure that the screw is tightened.
Excessive noise.	Incorrect module input sensitivity setting.	The unit is designed to digitize audio signals with an AD converter and vary the input level with a digital volume control. Therefore, noise increases if the input or output volume control is set to a level higher than 0 dB while the AD converter input is kept low.
Sound distorted.	Incorrect module input sensitivity setting.	The unit is designed to digitize audio signals with an AD converter and vary the input level with a digital volume control. Therefore, when an extremely large input is fed into the AD converter, the voice remains distorted even if the volume is decreased.
Phantom power not supplied.	D-001T module mounting screw not securely tightened.	If this screw is loose, phantom power is not supplied. Ensure that the module mounting screw is tightened.
Phantom power not supplied.	Phantom power set to OFF in D-001T module input setting.	If phantom power is set to OFF in D-001T module input setting, phantom power is not supplied. Set phantom power to ON in the setting.
Condenser microphone does not operate correctly.	Condenser microphone of the type powered by over +24 V is used.	The D-001T module's phantom power supplies +24 V. If using a condenser microphone powered by over +24 V, separately prepare phantom power supply equipment recommended by the equipment manufacturer.
Amplifier malfunctioned (does not operated as intended.)	Incorrect item or parameter setting.	Check the related setting items and set contents.

b. What happens if I unplug the power cord or power is lost?

- Of course-the power goes out. However, assuming the Firmware is version 3.10 or higher, the 9000 Series will retain its settings (memories-scenes, events, etc...). For restoration of power, the unit may be set to either:
 - a. Return to its last status before it lost power...
 - b. Default to a specific memory preset (scene or base event) upon having power restored.

ⓘ If the Firmware version is lower than V3.10, memory loss may occur. Please upgrade the firmware in this unit.

c. What do the error messages mean?

Error indications	Possible cause and Remedy
MODULE SLOT#No. ERROR	A module is inserted into a wrong slot. Check to confirm that each module is inserted into a correct slot, and correctly reinsert the module inserted into the wrong slot.
DC PROTECT (OUTPUT #No.)	There may be overload or excessive signal input. Check input and output signal levels and gain settings, then adjust them as necessary. If the indicator remains lit, consult your TOA dealer.
THERMAL PROTECT	The unit is heated to a high temperature. Check that the unit is properly installed. Disconnect the AC cord from the unit, and allow the unit to cool for a while. The unit automatically resumes operation when its inner temperature decreases. If this happens frequently, contact your TOA dealer.
ERASE MIXER MEMO?	The unit's Mode switch was shifted from the Mixer mode to the Matrix mode while the AC power supply was shut off. Press the Enter key to erase the data set in the Mixer mode inside the unit.
ERASE MATRIX MEMO?	The unit's Mode switch was shifted from the Matrix mode to the Mixer mode while the AC power supply was shut off. Press the Enter key to erase the data set in the Matrix mode inside the unit.
INITIALIZE MEMORY?	Module-to-Slot configuration was changed or a module was damaged. Perform any of the following operations: (1) Press the Enter key. The set parameter in question is reset to the default setting. (2) Press the Memory key. The unit continues to start up. After start-up is completed, back up the set parameters using the supplied software, then confirm the setting in question to correct. (3) Press the Escape/Back key. "MODULE SLOT#No. ERROR" appears indicating the error slot. Reinsert the correct module into the slot.
The Fault indicator lights.	A communication error between the unit and module occurred. Disconnect the AC power supply, then reconnect it. If the indicator remains lit, this may indicate a unit failure. Consult your TOA dealer.
The Fault indicator flashes.	A setting error occurs and a part of or entire data are initialized. Reconfirm the set data.

d. Where can I find additional 9000 Series Support Resources?

Log on to: <http://www.toa-corp.co.uk/asp/catalogue/products.asp?linkid=104&prodcode=M-9000%20Software>



Application Guide
(PDF, 234kb)



Spec. Sheet
(PDF, 983kb)



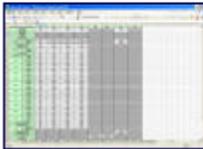
Maintenance Software v2.01 (ZIP, 885kb)
(Utility Software for Firmware Update, Download/Upload Settings, Status Monitoring and Virtual Control)



Programming Software v2.02 (ZIP, 36Mb)
(requires Firmware v3.13 Update, included in software download)

Programming Software Manual (PDF, 5.9Mb)

Sample Application Files (ZIP, 230kb)



MS Excel Programming Templates
(ZIP, 1.5Mb)

Remote Control Protocol

M-9000 Protocol

http://www.toa-corp.co.uk/user/data/toa_9000_rs232c_protocol_v312.pdf (PDF, 485kb)

NOTE: Protocols are compatible with v3.12 firmware or higher

Other resources

M-9000 Firmware

<http://www.toa-corp.co.uk/asp/catalogue/catalogue.asp?linkid=104> (ZIP, 1.4Mb)
(required to use new 9000 Series Programming Software, included with software download).

*Updated firmware not yet posted may be available through product support.

Quick Start Guide

<http://www.toa-corp.co.uk/user/data/M-9000%20quickstart.pdf> (PDF, 62kb)

9000 Series Remote Control Partners



Product Support: Mon-Fri 9:00am-5:30pm

0870 774 0986

13. GLOSSARY (GENERAL)

• **ANC (Ambient Noise Control) function (AN-001T only)**

The ANC function automatically adjusts the amplifier's output volume in response to the change in ambient noise level.

The output volume changes as the ambient noise level goes above or below the set reference level.

• **Ducker function**

The Ducker function automatically attenuates input signals with lower priority when two or more audio signals are simultaneously received. This function cannot be used if any of such received inputs is not set for the Ducker function.

• **VOX (Voice Operated Exchange) function (D-001T only)**

This function activates the set Event when an audio signal is input. No Event is activated when no input signal exists. If the audio signal drops below a preset level after the VOX function begins operation (i.e. after an audio signal is fed into the module), the set Event is terminated after approximately 5 seconds.

GLOSSARY (MATRIX MODE ONLY)

• **Event**

An "Event" is the unit that defines broadcast pattern and up to 32 Events can be stored.

• **Event classification**

[ROUTE]

This setting defines which audio input signal is transmitted to which audio output. Multiple outputs can be selected. Input channels set to priority levels 1 – 7 are for priority broadcasts, while the input channel set to priority level 8 is for BGM. Set Trigger to "None," "VOX" (D-001T only) or "Control Input" (1 – 12). Selecting Control Input for Trigger causes the BGM to be activated by pulse trigger, and priority broadcasts to be operated by level trigger. It is possible to synchronize control inputs and control outputs, with output being produced, as long as the Event is activated.

[BASE]

In this setting, multiple BGM Events are combined into one Base pattern so that they are simultaneously activated by means of a single activation signal. To use this function, BGM Events (signal routing from input to output) must be preset in the Route settings.

Up to 4 Route-set BGM Events can be combined into one Base pattern.

Example: Combining Route-set BGM Events Nos. 1, 2 and 3 into one Base pattern, and assigning the Base pattern to Event No. 4

When BGM Events to which the same output channel is assigned are individually activated, their broadcast zone depends on the priority setting (first-in-first-out priority, last-in-first-out priority, or mixing) performed in advance for the Events.

Though BGM Events combined in a BASE pattern are activated simultaneously, the BGM Event with the smallest input channel number is considered to have been selected first.

Example: Assigning the following two BGM Events to Event No. 3 as Base pattern.

Event 1 = Input 1 Outputs 1 and 2

Event 2 = Input 2 Outputs 2 and 3

In this example, Output 2 is duplicated. However, if system priority is set for "first-in-first-out" priority, BGM is broadcast to the following zones because Input 1 has a priority:

Event 1 = Input 1 Outputs 1 and 2

Event 2 = Input 2 Output 3

For Trigger, select "None" or "Control Input" (1 – 12). In Base settings, VOX cannot be selected for Trigger nor can control outputs be synchronized with control inputs. Base settings are not required when only one BGM program has been set in Route.

[BGM END]

This defines the method of stopping BGM broadcasts. Only "Control Input" (1 – 12) can be selected for Trigger. All current BGM broadcasts are stopped. Control outputs cannot be synchronized with control inputs.

To stop the specified BGM Event set in Route (including the case where only one Base pattern is broadcast) when two or more BGM Events are activated, turn off the corresponding input channel at the unit's front panel.

GLOSSARY (MIXER MODE ONLY)

- **NOM (Number of Open Microphones) attenuation function**

The NOM attenuation function automatically adjusts an output gain depending on the number of open microphones. The output gain is attenuated by the value set on the Utility setting screen each time the number of open microphones doubles. This function helps to prevent feedback.

- **Gate function**

The gate function allows the input signal to be passed, attenuated or cut depending on its signal level. The gate allows the signal to pass when open with the signal level over the set value, and to be attenuated or cut when closed with the signal level below the set value.

The gate's open/close operations control the Ducker function and the NOM attenuation function.

- **Scene**

A "Scene" is the unit that defines broadcast pattern and up to 32 types of Scenes can be saved as a Scene memory. Input and output parameters that have been set can be saved in the Scene memory and recalled as needed.

NOM TABLE:

NOM	xlogNOM				
	0	3	6	10	20
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.9	1.8	3.0	6.0
3	0.0	1.4	2.9	4.8	9.5
4	0.0	1.8	3.6	6.0	12.0
5	0.0	2.1	4.2	7.0	14.0
6	0.0	2.3	4.7	7.8	15.6
7	0.0	2.5	5.1	8.5	16.9
8	0.0	2.7	5.4	9.0	18.1



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