

8. SPECIFICATION

| | |
|-----------------------|-----------------------------------------------------------------------|
| Power Source | 24 V DC, 450 mA |
| Measurement Frequency | 50 Hz, 1 kHz |
| Measurement Range | 20 Ω - 10 kΩ (1 W - 500 W) |
| Input | 10 channels : 100 V line from amplifier outputs |
| Output | 10 channels : to speaker lines, max 500 W each channel |
| Control Output | 10 channels : dry contact (DC 30 V, 1 A) |
| Fault Control | 2 channels : common for all channel (1-10) |
| LED indicator | 10 led status ch (Normal: Green, Open: Orange, Short: Red) |
| | 4 led timer (Green) |
| | 1 led buzzer (Green) |
| | 1 led reset (Green) |
| | 1 led power (Green) |
| Switch | Timer : setting interval time (OFF, 1 Min, 1 Hour, 12 Hour, 24 Hour). |
| | Lamp Test, Calibrate, Measure |
| | Buzzer, Reset, 10 Channel |
| Operating Temperature | 0° C to +40° C |
| Finish | Front Panel : Aluminum, Hairline, Alumite black |
| | Case : Steel plate, Painting black |
| Dimension | 482 (w) x 44 (h) x 320 (d) in mm |
| Weight | 3.3 kg |
| Accessory | 6P Connector (12 Pcs) |
| | 2P Connector (1 Pc) |

Notes

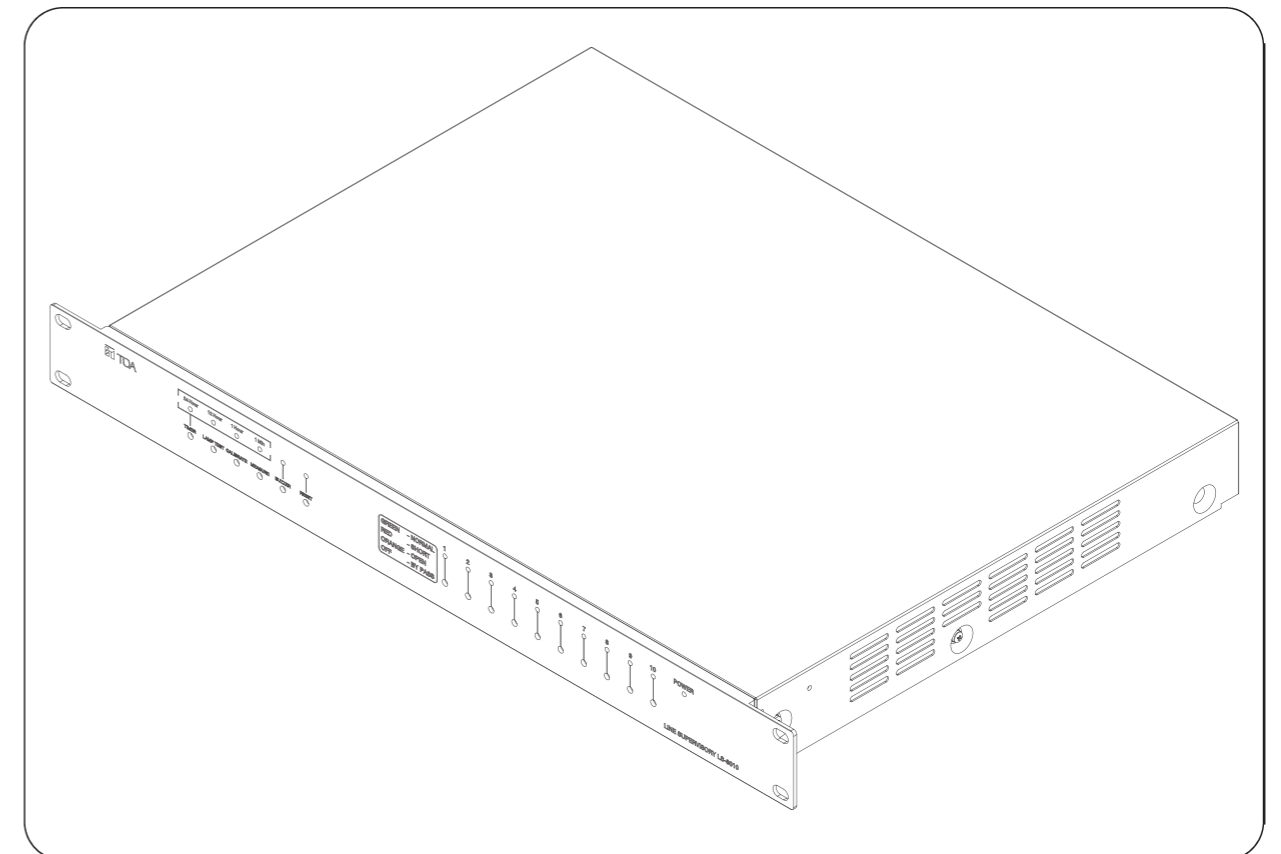
* The design and specifications are subject to change without notice for improvement.



OPERATING INSTRUCTIONS

LINE SUPERVISORY

LS-3010-AS



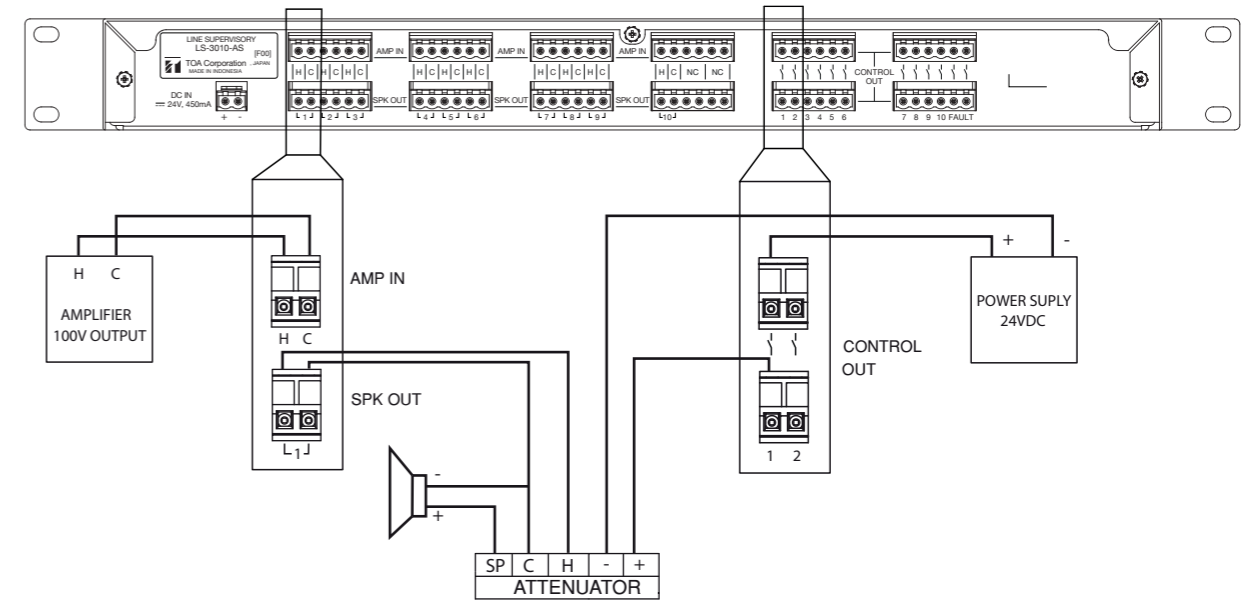
Please follow the instructions in this manual to obtain the optimum results from this unit.
We also recommend that you keep this manual handy for future reference.

TABLE OF CONTENTS

| | |
|-------------------------------------------------------|---|
| 1. SAFETY PRECAUTIONS | 3 |
| 2. GENERAL DESCRIPTION | 4 |
| 3. FEATURES | 4 |
| 4. NOMENCLATURE AND FUNCTIONS | 4 |
| 5. OPERATION | 6 |
| 6. INSTALLATION | 6 |
| 6.1. Installation Diagram for 2-wire Connection | 6 |
| 6.2. Installation Diagram for 4-wire Connection | 7 |
| 7. MAINTENANCE | 7 |
| 8. SPECIFICATION | 8 |

Please follow the installation diagrams below for 4-wire connection.

6.2. INSTALLATION DIAGRAM FOR 4-WIRE CONNECTION



WARNING

Do not reverse Amp input and Speaker output, if mishandled, could result in mistake measurement result.

CAUTION

Do not reverse H and C at Amp input and Speaker output, if mishandled, could result in an appropriate sound at Speaker output.

7. MAINTENANCE

- There is a 1.25 A fuse for DC supply.
Replace only with the same type of fuse.
- Buzzer will be ON when condition SHORT or OPEN is detected.
SHORT condition if measured impedance lower than calibrated impedance,
OPEN condition if measured impedance higher than calibrated impedance.
- When indication led is SHORT/OPEN, please to calibrate after check impedance condition and installation speaker, when you calibrate its already include the measurement.
- If such case still happen it is indicate problems in the installation, please contact your nearest TOA customer service, for consulting problems.

5. OPERATION

1. Connecting the high impedance amplifier output to 'AMP IN' and the speaker line to 'SPK OUT'.
2. DC Power ON.
3. Push the "calibrate" button to calibrate the speaker line.

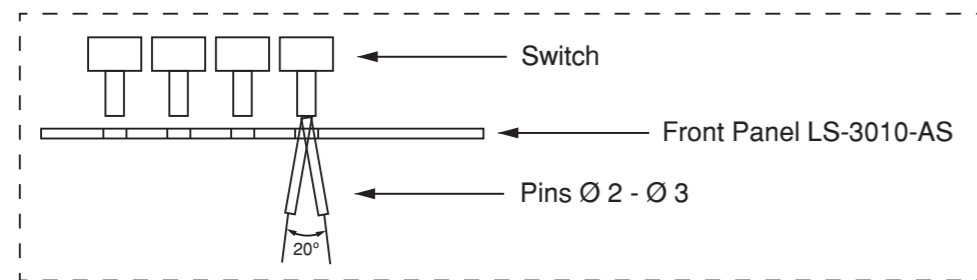
This calibration will measure the impedance of speaker line, the result will be shown at the LED status on the top of each channel switch.

If the result is in the measurement range, the LED status will be light GREEN.

If above the measurement range (> 10 kΩ) the LED status will be light ORANGE (open).

If below the measurement range (< 20 Ω) the LED status will be light RED (short).

4. The supervisory of the line speaker can be done manually using 'Measure' switch.
If the result is normal the LED status will be light GREEN, RED if short line, and ORANGE if open line.
5. Automatic supervisory of the line speaker can be done by setting timer.
There are 5 timer : OFF, 1 minute (1 Min), 1 hour (1 Hour), 12 hour (12 Hour), 24 hour (24 Hour).
Active timer will be indicated by LED for each timer.
Counting timer start/restart when push the TIMER switch and power ON.
6. Use a pin with diameter 2~3 mm to push the switch with an angle of 0-20 degrees.

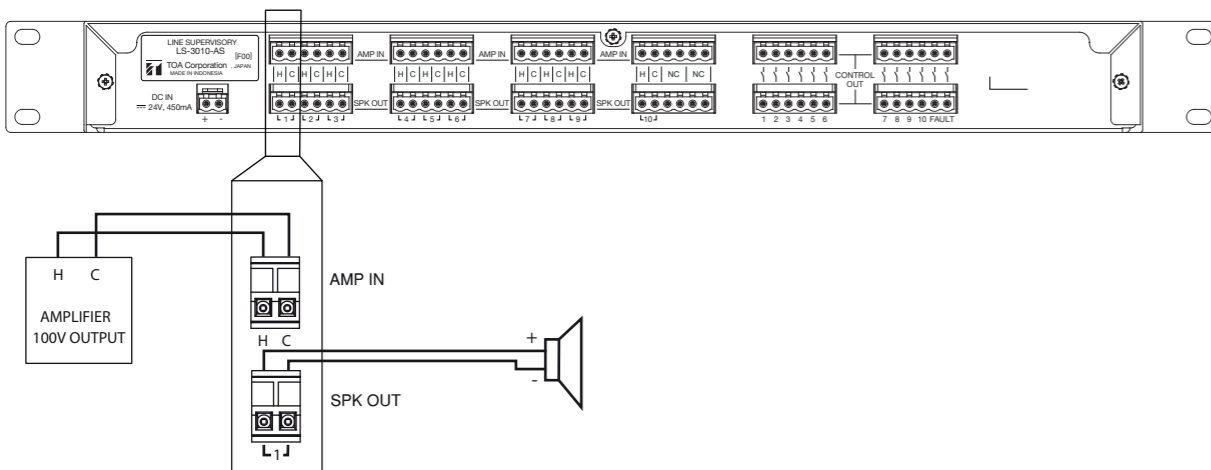


6. INSTALLATION

Line Supervisory is placed between amplifier output and speaker lines. When not calibrate or measure the connection between amplifier output and speaker lines is linked, but when calibrate or measure, line supervisory will bypass amplifier's connection, and do impedance measurement on speaker lines. After measurements are completed, the connection between amplifier output and speaker lines is linked.

Please follow the installation diagrams below for 2-wire connection.

6.1. INSTALLATION DIAGRAM FOR 2-WIRE CONNECTION



1. SAFETY PRECAUTIONS

- Be sure to read the instructions in this section carefully before use.
- Make sure to observe the instructions in this manual as the conventions of safety symbols and messages regarded as very important precautions are included.
- We also recommend you keep this instruction manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling.

Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety hazards.

⚠ WARNING

Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

⚠ WARNING

When Installing the Unit

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.
- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit it self -- on the power cord, as doing so may result in fire or electric shock.
- The terminals marked with the symbol ⚡ are hazardous live. The external wiring to these terminals requires installation by an instructed person.

- The socket - outlet shall be installed near the equipment and the plug (disconnecting device) shall be easily accessible.

- Be sure to replace the unit's terminal cover after connection completion. Because the voltage of up to 100 V is applied to the high impedance speaker terminals, never touch these terminals to avoid electric shock.

- Be sure to ground to the safety ground (earth) terminal to avoid electric shock. Never ground to a gas pipe as a catastrophic disaster may result.

When the Unit is in Use

- Should the following irregularity be found during use, immediately switch off the power, disconnect

the power supply plug from the AC outlet and contact your nearest TOA dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.

- If you detect smoke or a strange smell coming from the unit.
- If water or any metallic object gets into the unit.
- If the unit falls, or the unit case breaks.
- If the power supply cord is damaged (exposure of the core, disconnection, etc).
- If it is malfunctioning (no tone sounds).

To prevent a fire or electric shock, never open nor remove the unit case as there are high voltage components inside the unit. Refer all servicing to you nearest TOA dealer.

Do not place cups, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.

Do not insert nor drop metallic object or flammable materials in the ventilation slots of the unit's cover as this may result in fire or electric shock.

⚠ CAUTION

When Installing the Unit

Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.

When unplugging the power supply cord, be sure to grasp the power supply plug: never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.

- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Do not block the upper panel ventilation slots in the unit's cover. Doing so may cause heat to build up inside the unit and result in fire.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.

When the Unit is in Use

- Do not place heavy objects on the unit as this may cause it to fall or break which may result in personal injury and/or property damage. In addition, the object itself may fall off and cause injury and/or damage.

2. GENERAL DESCRIPTION

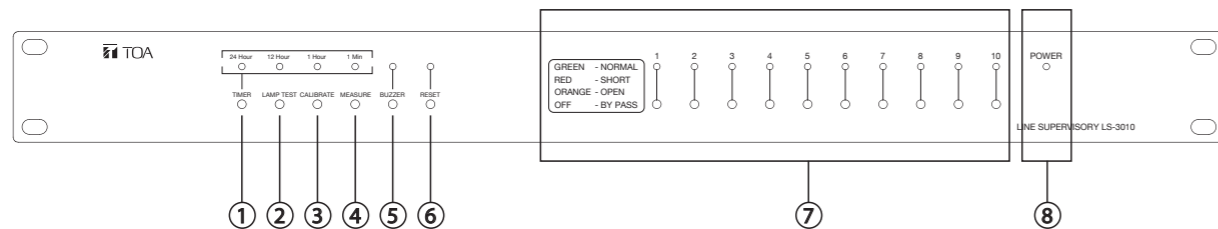
TOA's Line supervisory LS-3010-AS is a highly efficient line supervisory for monitor the impedance of speaker line, with LED indicator for normal, open, or short condition.

3. FEATURES

- High durability, high reliability and high efficient.
- 10 Channels input from amplifier and 10 channels output to speaker line.
- 20 Ω ~ 10 k Ω (1 W - 500 W) measurement range.
- 10 channels attenuator bypass control NO (Normally Open) connector.
- 2 channels fault control NO (Normally Open) connector.
- LED indicators (normal, open and short).
- CUT OFF (Isolate output if detect a short speaker line).

4. NOMENCLATURE AND FUNCTIONS

[FRONT]



1. TIMER Switch and Indicator

Switch to select interval time of auto measurement.

There are 5 options: off, 1 minute, 1 hour, 12 hour and 24 hour.

The selected time will have light GREEN on the led status.

Timer counting will be reset when timer setting and power ON.

2. LAMP TEST Switch

Switch to test all led indicator and buzzer.

3. CALIBRATE Switch

Switch for calibrating purposes. Calibrate impedance all channel with pilot tone 1KHz.

4. MEASURE Switch

Switch for measuring purposes. Measure impedance all channel with pilot tone 50Hz.

5. BUZZER Switch and Indicator

Switch for activated/deactivated buzzer function.

The led status of buzzer will be light when buzzer activated.

Push and hold for more than 5 second, the line supervisory will be reset as factory default.

6. RESET Switch and Indicator

Switch for reset system.

7. Channel Switch and Indicator

Each channel have 3 status : NORMAL, OPEN and SHORT.

LED will be light GREEN (normal), ORANGE (open) and RED (short).

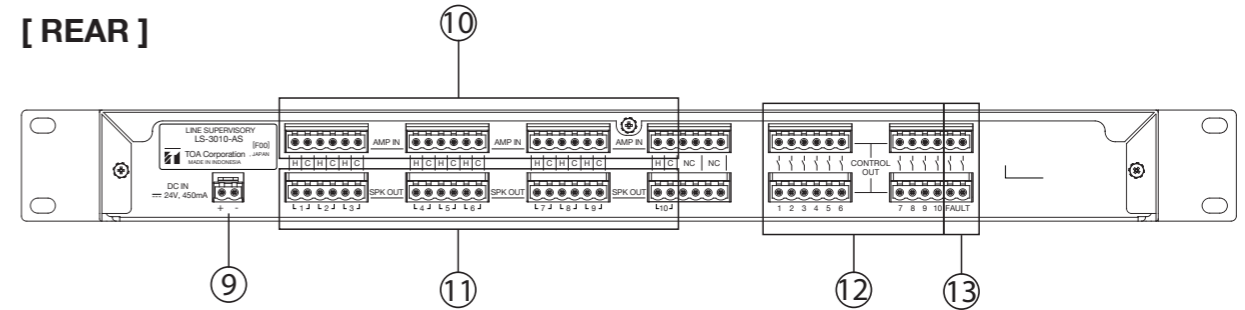
If channel switch OFF, line supervisory will calibrate/measure the channel.

If channel switch ON, line supervisory will skip the channel when calibrate/measure all channel.

8. Power Indicator

LED for indicate power when line supervisory turn on.

[REAR]



9. DC Power Input

DC Power Input terminal, 24V DC. Terminal block 2 pins.

10. Amplifier IN (AMP 1-10)

Signal input from Amplifier, 100V RMS rated, power rated 500W.

11. Speaker Out (SPK 1-10)

Speaker output CH 1-10, 100V RMS rated, power rated 500W.

12. Control Out (CH 1-10)

Control output CH 1-10, dry contact. It will short when calibrate and measure the channel.

13. Fault Out (common CH 1-10)

For common fault indication. It will short when 1 or more channel have OPEN or SHORT status