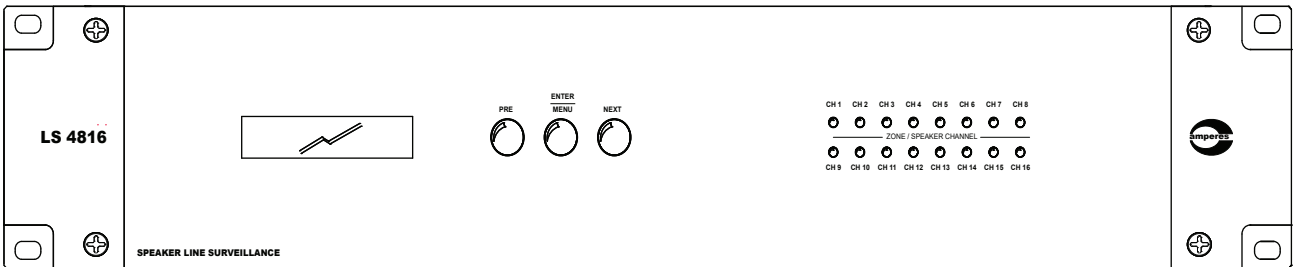
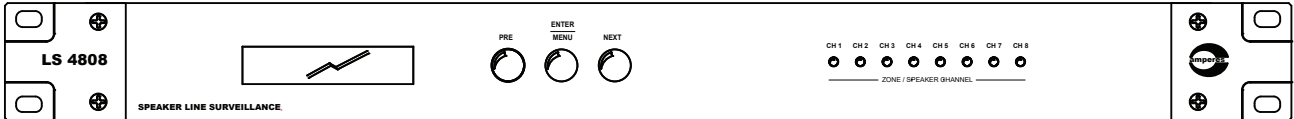




INSTRUCTION MANUAL

LS4808 / 4816 8 / 16 Channel Speaker Line Monitoring



Thank you for choosing another quality product from Amperes Electronics.

LS4808 and LS4816 are important tool in monitoring your speaker line circuits, ensuring every speaker zone is in good condition. New measuring algorithms has been developed to enable measurement of impedance faster with higher accuracy within a narrow tolerance. Another new feature included is the remote trigger which can be connected to weekly timer to enable monitoring according to the preset times.

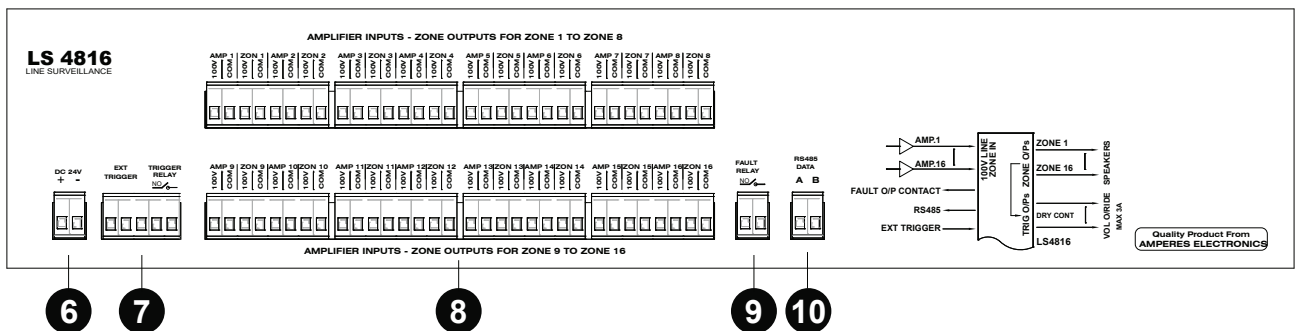
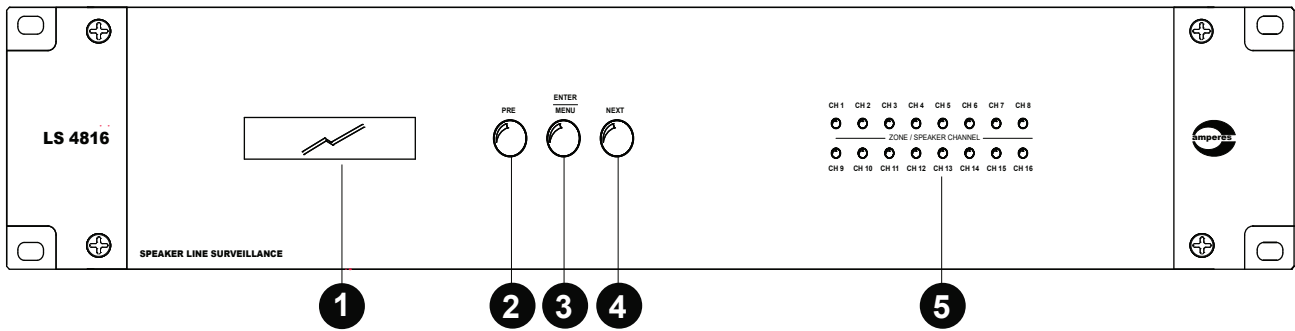
LS line surveillance unit uses impedance measurement method which allows flexibility in speaker cablings such as branching and does not require end line resistors or blocking capacitors at the speakers. Its RS485 data output enable remote monitoring and controls via customised software or upcoming PMX III Console.

Prior to installation, we suggest a thorough read through of the manual to get a proper understanding of the unit and what it can offer. We are pretty sure that you are having a premium product at optimum price for your system.

Please keep this manual for future references.



Parts Identifications



1. LCD DISPLAY

2 x 16 digit LCD display with back light setting is used as programming guide as well as measurement indications.

2. PREV BUTTON

Previous key to scroll back to last menu or sub menu.

3. ENTER / MENU BUTTON

Menu switch is used to access main menus. Once pressed momentarily, it shall revert to Menu 1.0 - Setup. Use Next or Prev keys to scroll through other main menus. Once the relevant menu is found, use Enter key to access its following sub menu. To exit sub menus, press Menu key momentarily.

4. NEXT BUTTON

Next button to shift to next menu sub menu.

5. ZONE / SPEAKER CHANNEL LED INDICATORS

The green LED indicates the corresponding channel is normal, whereas red indicates that channel is faulty.

6. 24V DC POWER SUPPLY PORT

The unit requires 24V DC power supply and recommended PSU shall be Amperes PS9400. Only use regulated power supply if other than PS9400 is installed.

Parts Identifications

7. ZONE TRIGGER OUTPUT PORT

When line monitoring is initiated either manually or auto, it shall start in sequence from ch.1 to 16. With each channel under monitoring, a dry contact shall be available. This shall provide 24V overriding voltage to volume controllers or local patch panel with overriding relay, thus allowing direct measurement to the speakers. (Refer to Connecting the unit section of the manual). Overriding is required for accurate sensing in which volume controllers set in various position shall have different impedances and such circumstances shall provide false alarm or alert.

Recommended practice is that every zone shall have its own 24V overriding circuit back to the rack. If all the overriding circuits are looped, and if the particular zone with volume controller is set to off, the monitoring activity shall cause a burst of audio signal (such as BGM), which lasted for approximately 18 seconds. This shall happen only when a BGM source is presence. If the particular zone is set to OFF (without BGM), the monitoring activity shall not emit audible sound.

8. AMP / ZONE IN - OUT PORTS

It is for connections of incoming 100V line signal and output to speakers. Refer to Connecting the Unit in following section.

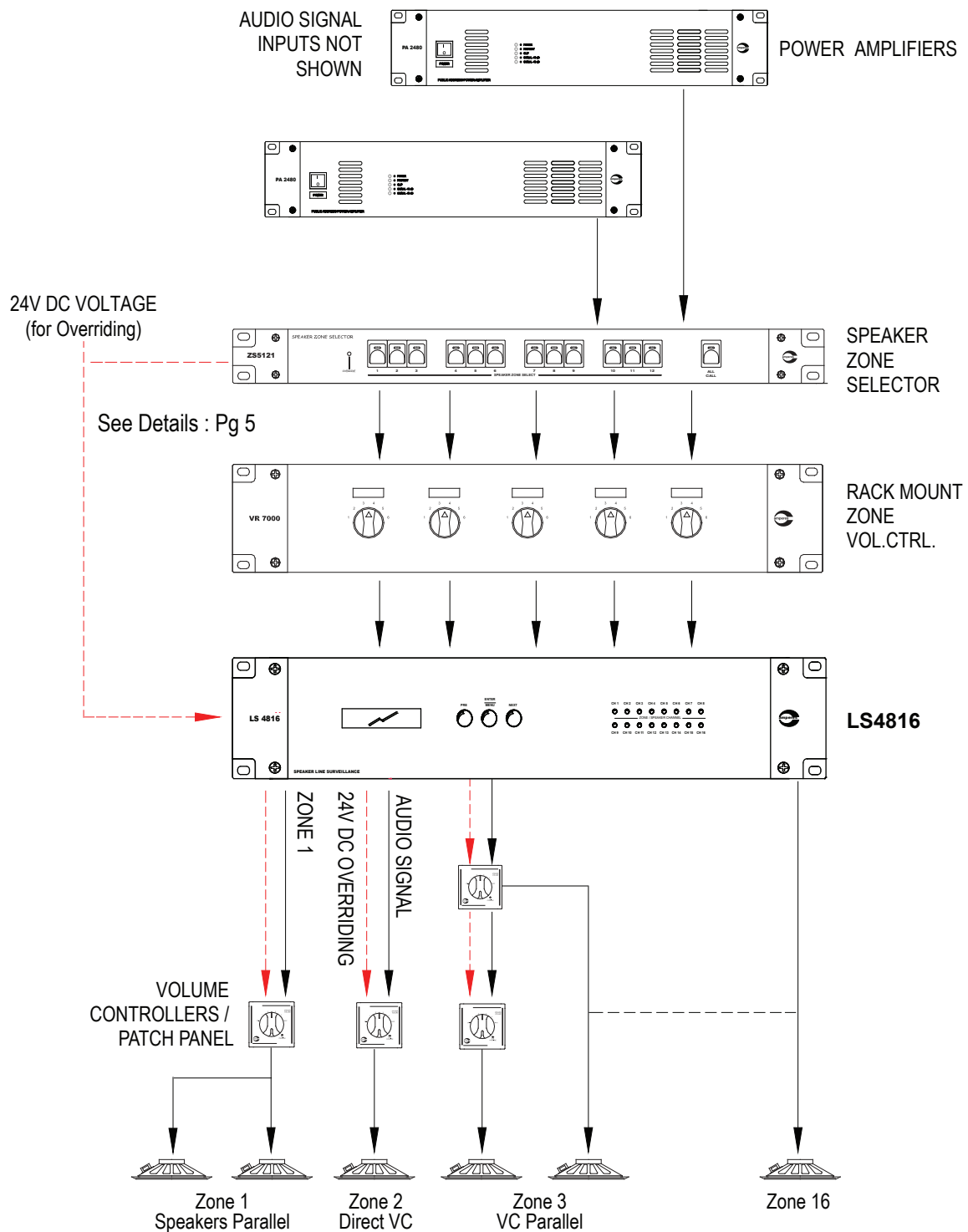
9. OUTPUT FAULT CONTACT

Whenever a fault condition is detected, this port shall provide a dry contact to link to external alerting devices, such as mimic panel, etc.

10. RS485 OUTPUT (OPTIONAL)

Event triggered data shall be transmitted with RS485 protocol.

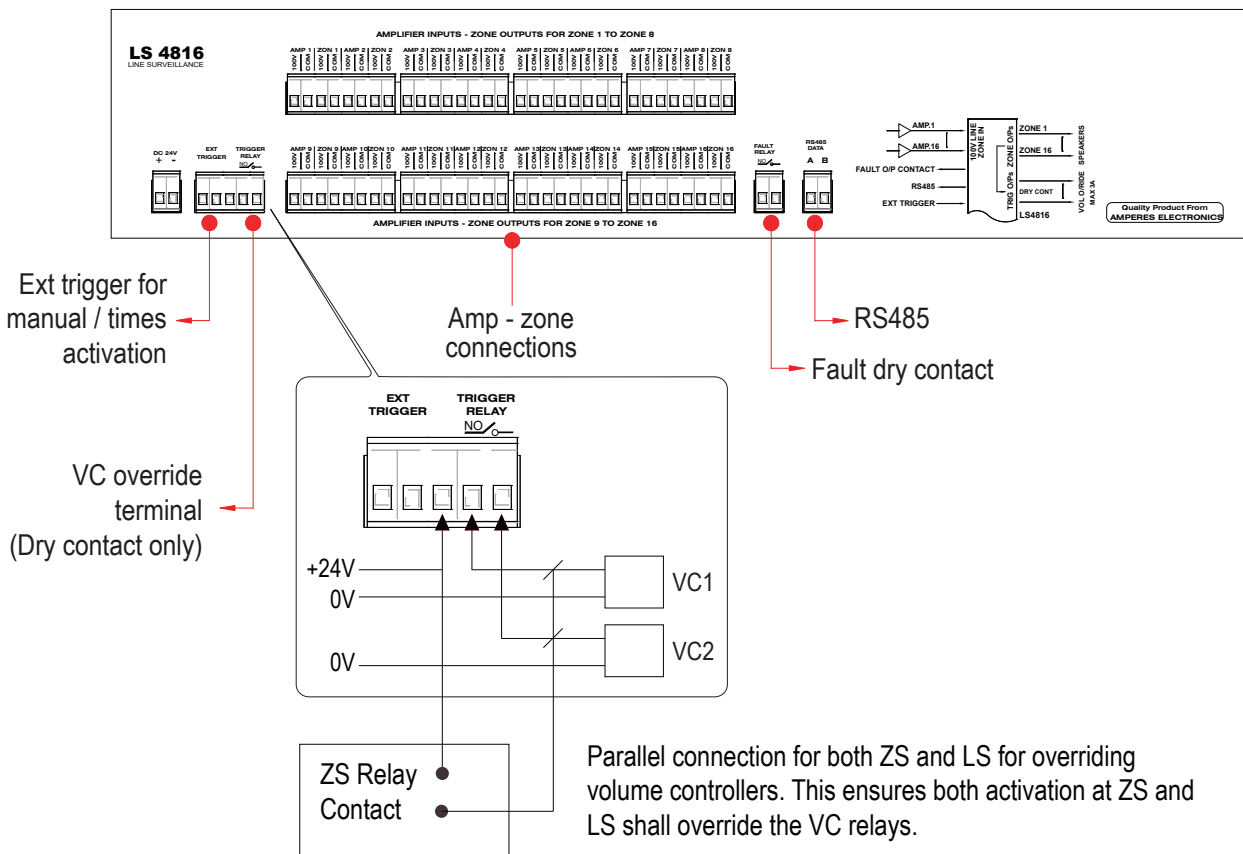
Configuration / Schematic



The LS4808 / 4816 detects circuit faults using impedance measurement method. In general, there is no limitation on how the external cabling to speakers or volume controller are run, ie. branching is allow and does not need end line resistors as well as speaker capacitor couplings.

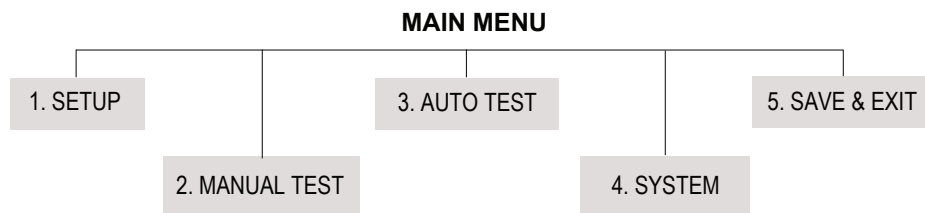
It is recommended that periodical manual checking or setup to be made as connections may deteriorate over time and thus affecting overall impedance value.

Connecting The Unit



Programming And Setup

In general, there are 5 main menus as shown below:



NOTE :

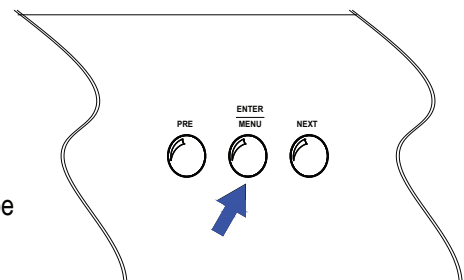
Minimum setup required for the system to run shall be Menu 1.0. If other menus are not set, they shall run according to default parameters.

POWER UP

Upon powering for the first time, the unit shall display wordings ' Speaker Line Surveillance'. The red LEDs shall lit in sequence indicating sequence of initialisation.

TO ENTER SETUP

To begin programming, press MENU button, and the SETUP menu shall be displayed.



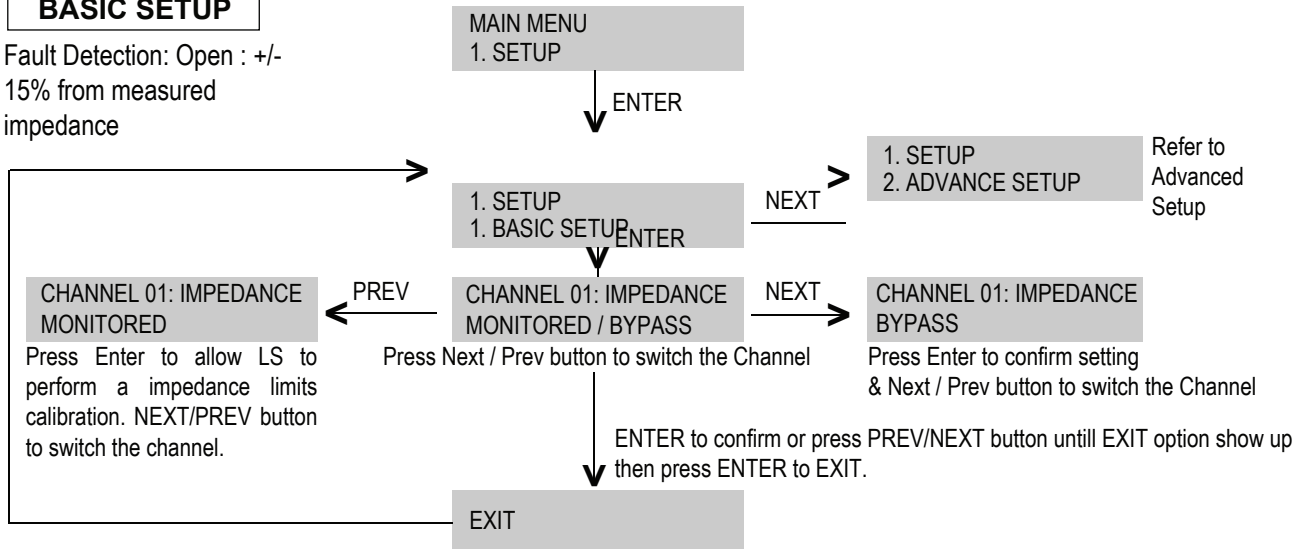
1. Setup Menu

There are 2 modes of operation available : Basic and Advance.

In Basic setup mode, LS4808 / 4816 shall detect the circuit for circuit fault automatically. The timing of detection shall depend on the intervals set in Auto Detection mode, (Refer to Auto Test section). Follow the steps below to use this mode.

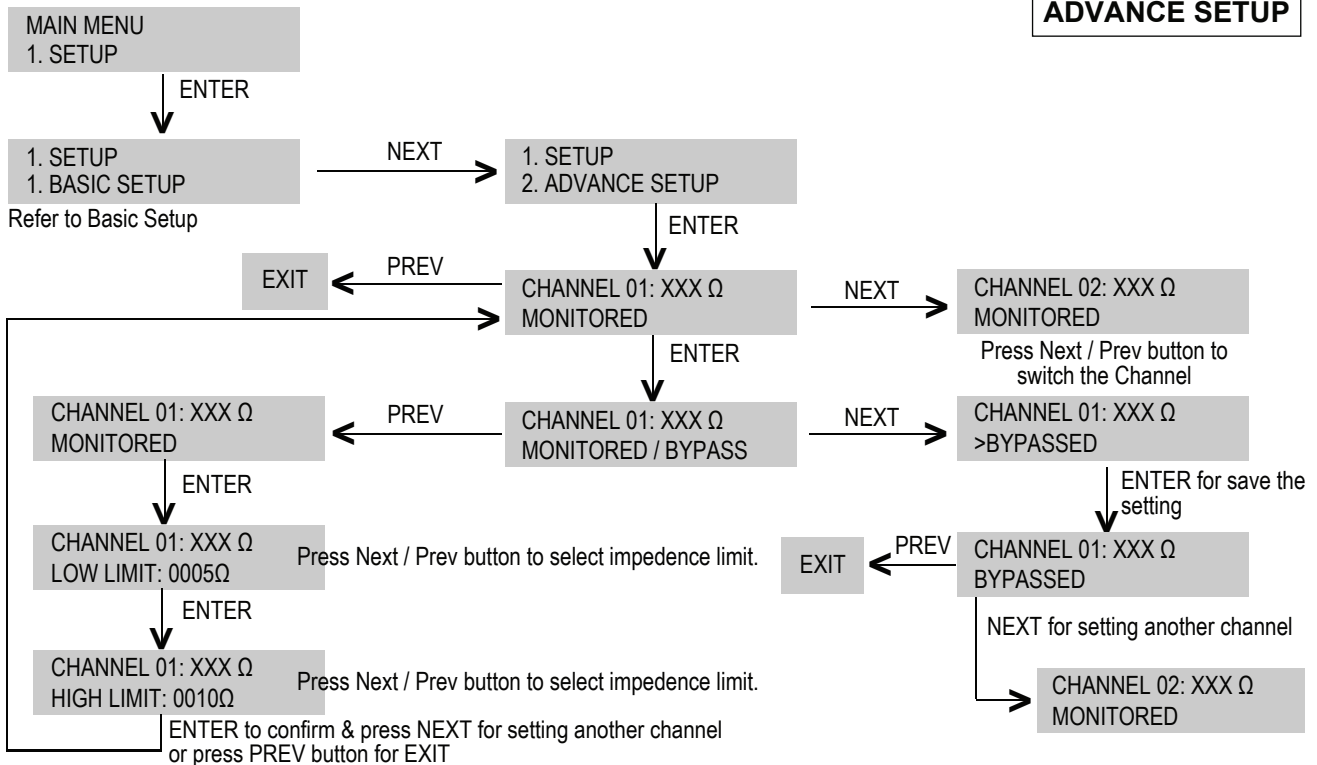
BASIC SETUP

Fault Detection: Open : +/- 15% from measured impedance



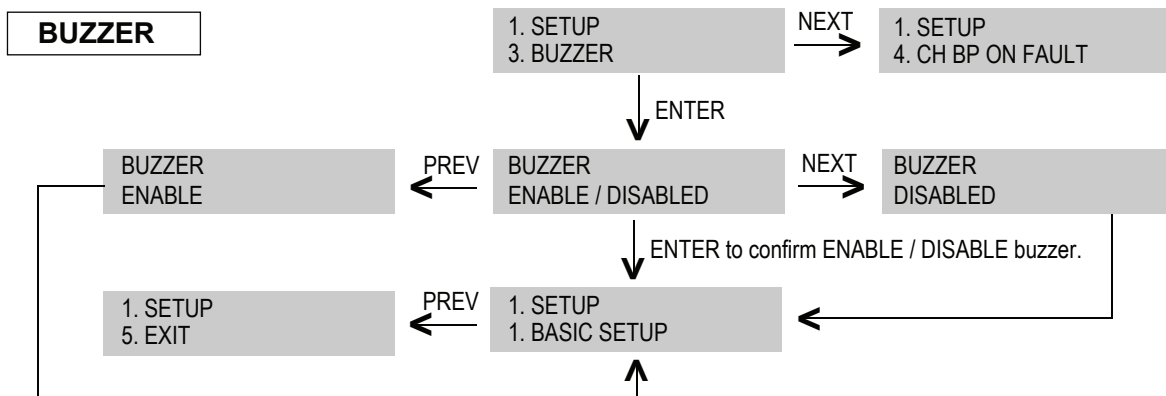
Note: The unit shall measure the impedance of each channel, creating the high and low limits automatically. Whenever the measured impedance falls outside the limits, the channel shall be considered faulty. The limits are typically 15%, eg if the circuit has impedance of 1K Ω , the limits generated shall be 850 to 1.15K Ω .

ADVANCE SETUP



Note: In long cable circuit or zone with multiple branchings the basic mode may not be suitable to detect the fault such as short at the far end of cable (e.g: 500m), cables itself has resistance, thereby would not show short phenomena. It is therefore, Advance setup shall be used.

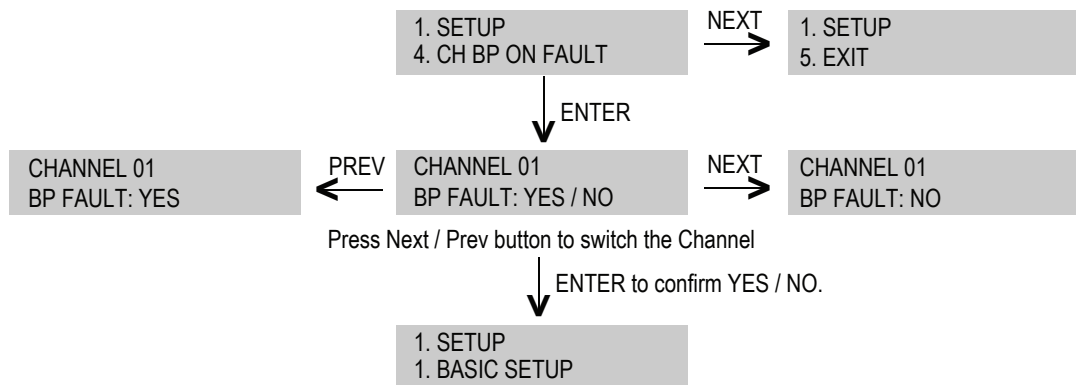
1. Setup Menu



Buzzer is available for button pressing and alert / fault signal. This feature can be turned off to fit to ones' preference.

For fault alert buzzer, if this is switch on, the Buzzer LED shall not lit when a failure is detected. If the buzzer is switched off, the buzzer LED and the correspondence channel fault LED shall lit.

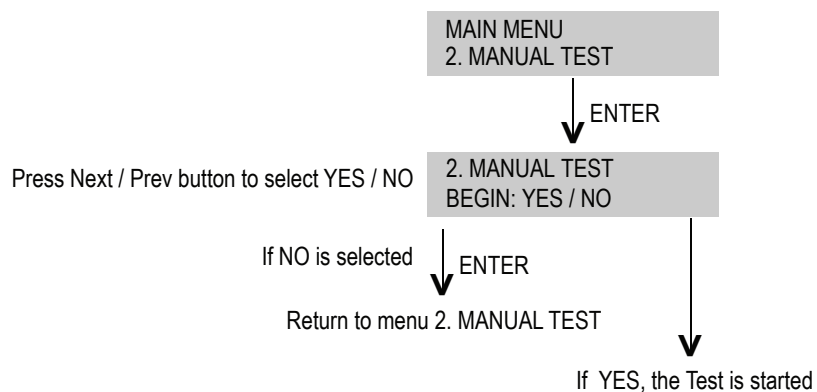
CH BP ON FAULT



Channel Bypass (BP) can be an option. The user can select the affected faulty channel to be bypassed (on isolated) from connection to the amplifier output. This is to protect the amplifier and also not to interfere with other good zone(s) which are sharing the same power pack.

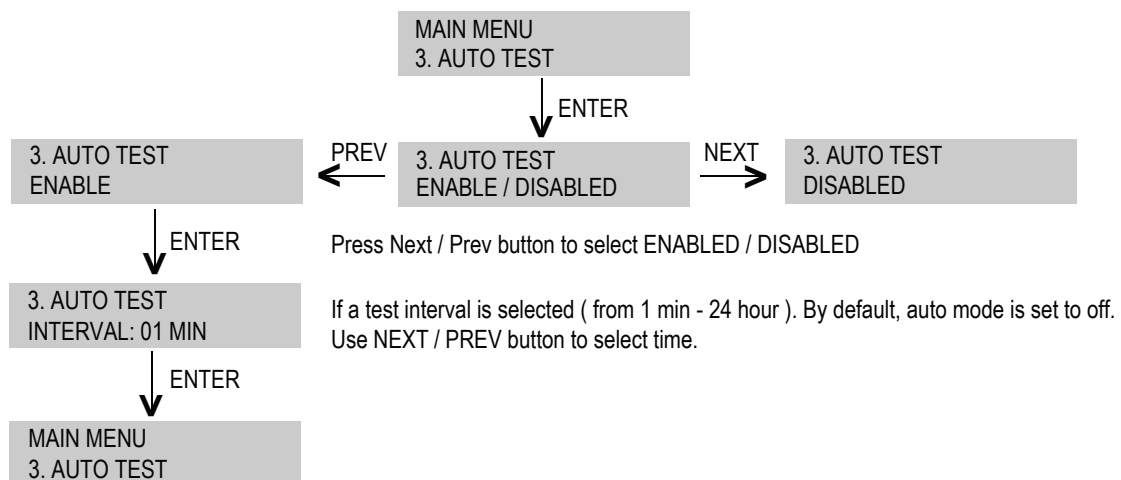
However not all faulty zones are “hazardous” to the amplifiers, such as a few disconnected or faulty speakers would not affect the circuit entirely. Thereby user can set this feature as an option.

2. Manual Test

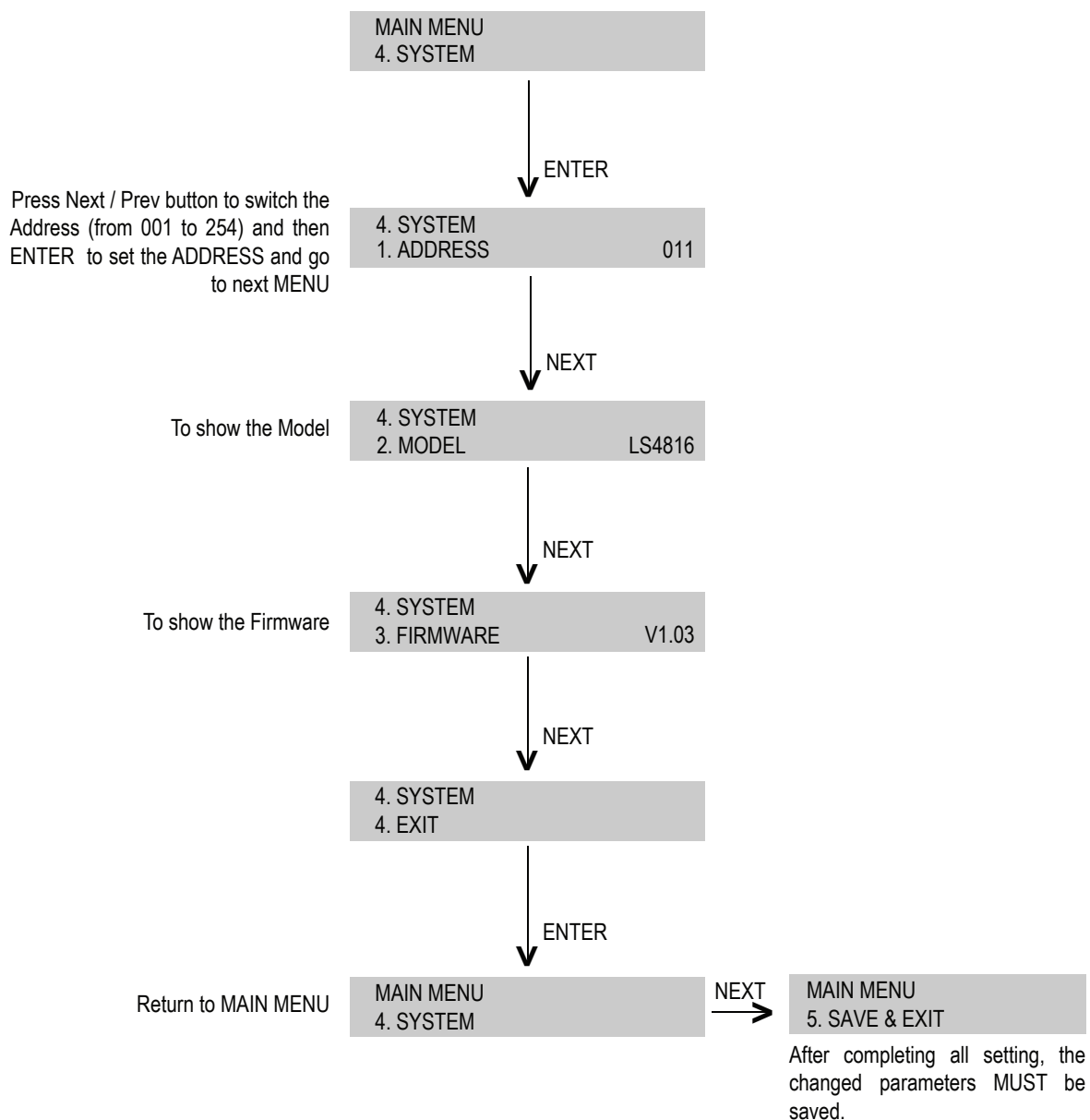


Use this function to test speaker line impedance of each channel.

3. Auto Test



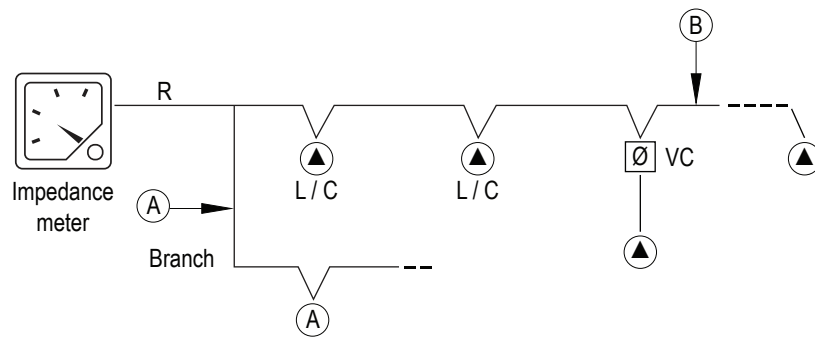
4. System



IMPORTANT NOTES

LS4808 / 4816 are used to detect faulty speaker circuits and the impedance measured shall not be used as final value / reading as conclusions. The actual reading may differ from actual impedance meter in range of 5%.

Notes On Speaker Line Impedance



In reality, impedance of a speaker circuit consists of Resistance (normally cable) and Capacitive reactance and Inductive reactance.

$$Z = R + \text{Inductive Reactance} + \text{Capacitive Reactance}$$

Using a multimeter (pure resistance measurement) to measure a speaker circuit is not the accurate tool to determine the value to calculate the total load of the line, which they are not capable to measure the Capacitive or Inductive reactance of cable and speaker coils.

In circuit with branching, a break at point (A) would not trigger an 'open circuit' alarm, and a short at point (B) would not trigger 'short circuit' indication as these still exist some impedance due to cable resistance.

LS4808 / 4816 has unique way to detect faults, there by using basic mode, creating an impedance limit range and for more sensitive detection, set the unit to 'advance' mode.

Summary Of Features

- 8 / 16 channel speaker line monitoring and expandable
- Basic and Advance level of detection setup
- Detection of faulty cable and speaker in individual zone or circuit
- Impedance measurement method - no capacitor coupling required and cable branching allowed.
- Faulty circuit disconnection option
- Built in impedance meter, range within 10 Ohm to 10 K Ohm
- LCD display to facilitate system setup, measurement and monitoring
- Fault alert with LED indicators and switchable buzzer
- Detection test interval setting from 1 min to 48 hours
- Short burst test signal, minimizing interruption to PA operation
- User setting for detection sensitivity for open, short and leakage
- Aux 24V DC output for volume controller overriding during testing mode

Technical Specifications

	LS4808	LS4816
Operating voltage	24V DC via PS9400 adaptor	
Power consumption	3.8W	4.9W
Capacity (channel)	8	16
Impedance detection range	10 to 10 K Ohm	
Power measurement range	10 to 1000W 100V line	
Measurement accuracy	5% within range	
Pilot tone injection frequency	1 KHz	
Pilot tone signal output level	5V sine	
Monitor triggering	Auto / remote trigger	
Transmittal detection period	0.5 second per channel (max)	
Detection interval	User preset from 1 min to 48 hrs	
Sensitivity setting	User preset at each channel	
Indicators - LED	Normal, Fault, Buzzer, Auto run	
Display LCD	2 x 16 characters w back light	
Audible output signal	Continuous buzzer with Off option	
Dry contact setting	3A	
DC output in detection mode	24V DC	
Dimensions (W x H x D)	482 x 44 x 180 mm	482 x 88 x 180 mm
Weight	2.15kg	3.25kg

Note:

The above specifications are correct at time of printing but subjected to changes without prior notice due to product improvements.

Warranty Conditions

Only Amperes Electronics Service Centres are allowed to make warranty repairs : a list of Amperes Electronics authorized service centres may be asked by the purchaser or send directly to Amperes Electronics Sdn Bhd at 70 Jalan Industri PBP3, Tmn Perindustrian Pusat Bandar Puchong, 47100, Puchong, Selangor. This warranty is not valid if repairs are performed by unauthorized personnel or service centres.

This warranty covers only repairs and replacement of defective parts. Cost and risk of transportation as well as removal and installation of the product from the main system are for the account of the purchaser. This warranty shall not extend to the replacement of the unit.

This warranty does not cover damages caused by misuse, negligence in application as well as using the product with power supply voltage other than shown on the product, or any other power supply source / adapter not recommended by the manufacturer.

This warranty does not cover damages caused by fire, earthquakes, floods, lightning and every cause not directly related to the unit.

This warranty does not include any indemnity in favor of the purchaser or the dealer for the period out of use of the unit, moreover the warranty does not cover any damages which may cause to the people and things during the use of the product.

This warranty certificate is valid only for the described product, and is not valid if modifications are made on this certificate or identification labels applied to the unit or any other modifications to the physical unit other than its intended usage.

This warranty covers all the material and manufacturing defects and is valid for a period of 36 months from the date of purchase or for a specified period in countries where this is stated by a national law. In this case, the extension is valid only in the country where the product is purchased.

Amperes Electronics Sdn Bhd is not obliged to modify previously manufactured products under warranty if the design changes or improvements are made.

The purchaser is deemed to agree to the above warranty conditions once the product packaging is unpacked., Otherwise the product shall be returned to the seller in proper original condition.

Disclaimer

Information contained in this manual is subjected to change without prior notice and does not represent a commitment on the part of the vendor. Amperes Electronics Sdn Bhd shall not be liable for any loss or damages whatsoever arising from the use of information or any error contained in this manual.

It is recommended that all services and repairs of this product to be carried out by Amperes Electronics or its authorized service agents.

Amperes products must only be used for the purpose they were intended by the manufacturer and in conjunction with this operation manual.

Amperes Electronics Sdn Bhd cannot accept any liability whatsoever for any loss or damages caused by service, maintenance or repair by unauthorized personnel, or by use other than that intended by the manufacturer.



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