Loudspeakers Line Isolator System

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BOSCH
Invented for life

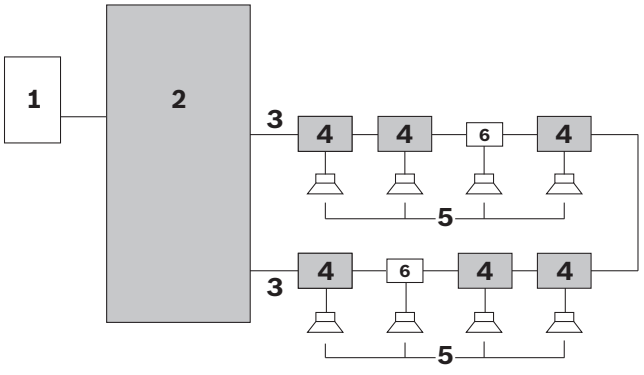
- Provides redundant loudspeaker loops for public address and voice alarm systems
- Dramatically reduces cost and complexity of installations, by largely eliminating expensive E30 cabling
- Six loudspeaker loops per Master Unit, and up to 50 Isolator Boards per loop
- Operates on 24 and 48 VDC backup power
- Walk Test mode and installation test button for easy fault-finding and installation

The Loudspeakers Line Isolator System is the cost-efficient solution for preventing loss of audio function in public address and voice alarm systems as a result of loudspeaker line faults.
It largely eliminates the need for expensive E30 cabling by making use of the so-called loop wiring method.
The system is fully supervised and is perfectly suited for use in commercial premises, such as office buildings and hotels.

Typical applications include:

- Public address systems that cover large zones: more than 25 loudspeakers per zone.
- Voice alarm: locations that have several rooms in the same fire zone.

System overview



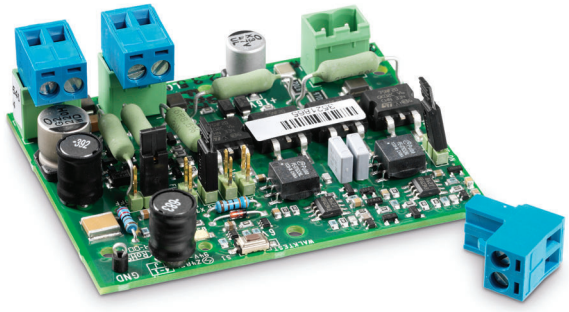
Number	Item
1	Zone output of public address/voice alarm system
2	Master Unit
3	Loudspeaker loop
4	Isolator Board
5	Loudspeaker
6	DC Blocking Board

The Loudspeakers Line Isolator System consists of the following products:

Master Unit

PM1-LISM6
The zone outputs of the public address/voice alarm system (1) are connected to the rear of the Master Unit (2), which can manage a total of six (500 W) loudspeaker loops (3).
The status of each loop is indicated by LEDs on the front panel of the Master Unit. The front panel also has LEDs to indicate the status of the mains supply and backup battery power supply. All fault indicators on the front panel are linked to fault relays on the rear panel of the Master Unit.

Isolator Board
Supplied with IP30 rated housing:

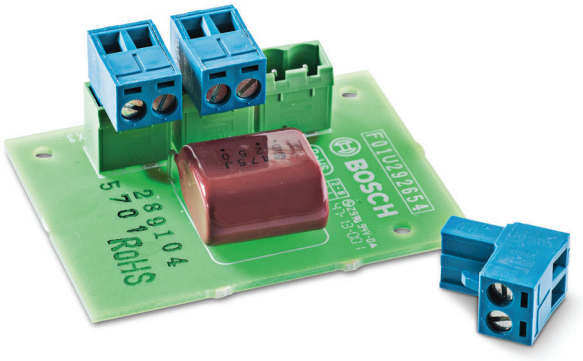


PM1-LISS
The Isolator Boards (4) are daisy-chained in the loudspeaker loop and distribute audio from the public address/voice alarm system, via the Master Unit, to the loudspeakers (5).
Their main function is to:

- detect and isolate short circuits in the adjacent segment.
- detect and isolate open circuits, short circuits, and overloads on a tap-off.

A maximum of 50 Isolator Boards can be installed in each loudspeaker loop.
The Isolator Board has two 100 V audio connectors for connecting to both sides of the loudspeaker loop and a third 100 V audio connector for creating a tap-off for one or more loudspeakers. Jumper settings are provided to set the permissible loudspeaker power level (10, 36, 100 W or 10 W with 20 kHz pilot tone filter), and other supervision settings.
The Isolator Board has a test/fault LED. This LED is visible when the board is mounted in the supplied housing, allowing for easy fault-finding in the system.

DC Blocking Board



PM1-LISD
The DC Blocking Board blocks DC and provides overload protection by use of current limiting. It has the same connections as the Isolator Board, which allows for quick and convenient connection of the loudspeaker loop and tap-off connections (maximum 20 W loudspeaker load). The DC Blocking Board can be mounted inside selected Bosch loudspeakers.

Functions

Controls and indicators
The Loudspeakers Line Isolator System is fully supervised; reported faults are non-latching. There are no operator controls on the front or rear panels of the Master Unit. The user interface on the front panel consists of LEDs that indicate the following conditions:

- Walk Test mode
- Fault
- Loop initialization
- Loop OK

The status of the mains supply and backup battery power supply is also indicated.
The rear panel contains the interconnections, voltage selector, mains power switch, and DIP switches for setup and test purposes.

Certifications and approvals

Approvals

Safety	acc. to EN 60065
Emission	acc. to EN 55103-1
Immunity	acc. to EN 55103-2, and EN 50130-4
Maritime	acc. to EN 60945
Evacuation	acc. to EN 54-16

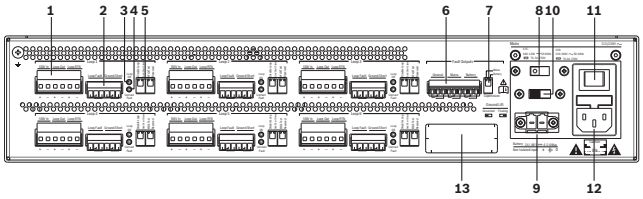
Compliance

Compliant for use as described in	NEN2575, VDE0833, and BS5839
Evacuation	acc. to EN 60849

Region	Certification	
Europe	CPR	EU_CPR
	CE	
	CE	DOP

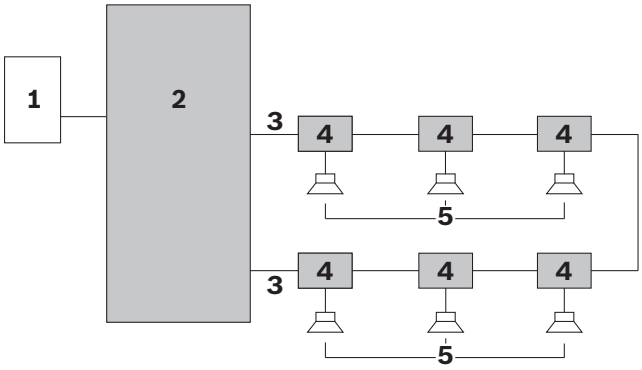
Installation/configuration notes

Connections and switches on rear of Master Unit

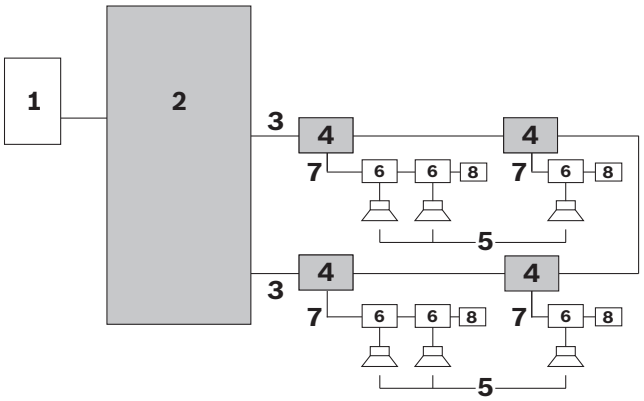


1. Loop connection (6x): Input; Send; Return
2. Fault output connection per loop
3. Loop OK LED per loop
4. Connection fault LED per loop
5. DIP switches per loop: Disable loop; Ground short/ Slave; Walk Test
6. Common fault outputs: General; Mains; Battery; Ground short
7. DIP switch: Mains supervision; Battery supervision
8. Voltage selection switch: 115/230 VAC
9. DC back-up supply input connector: 24-48 VDC
10. Ground lift selection switch
11. AC mains power switch
12. AC mains input socket 115/230 VAC

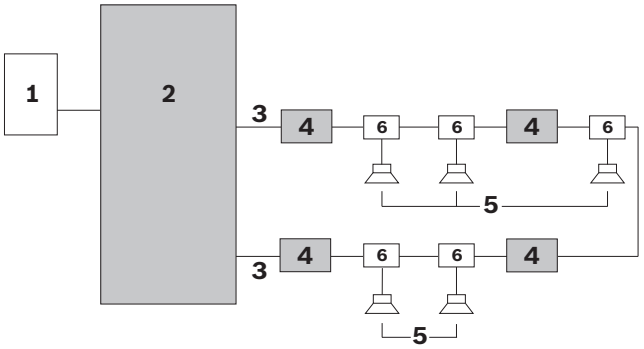
Installation options



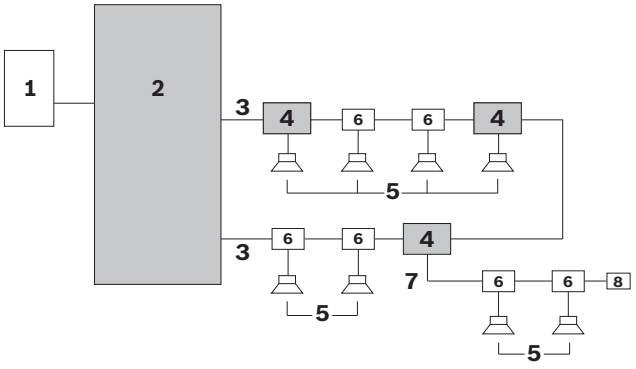
Installation option 1: One Isolator Board for each loudspeaker



Installation option 2: Branch of loudspeakers connected to an Isolator Board



Installation option 3: Loudspeakers connected between Isolator Boards



Combined installation options

Number	Item
1	Zone output of public address/voice alarm system
2	Master Unit
3	Loudspeaker loop (one loop shown)
4	Isolator Board
5	Loudspeaker
6	DC Blocking Board or DC blocking capacitor
7	Tap-off for loudspeakers
8	End-of-line resistor

Parts included

Quantity	Component
	PM1-LISM6 – Master Unit
1	Master Unit
1	Safety instructions
1	Notice with instructions for downloading manual
1	Mains power cord
1	Set of connectors
1	Set of 19" 2U mounting brackets
	PM1-LISS – Isolator Board
1	Isolator Board
1	Set of connectors
1	IP30-rated housing
1	End-of-line resistor (47 kohm, 0.5 W)
1	Cable ties for strain relief
	PM1-LISD – DC Blocking Board
1	DC Blocking Board
1	Set of connectors

Technical specifications

PM1-LISM6

Electrical

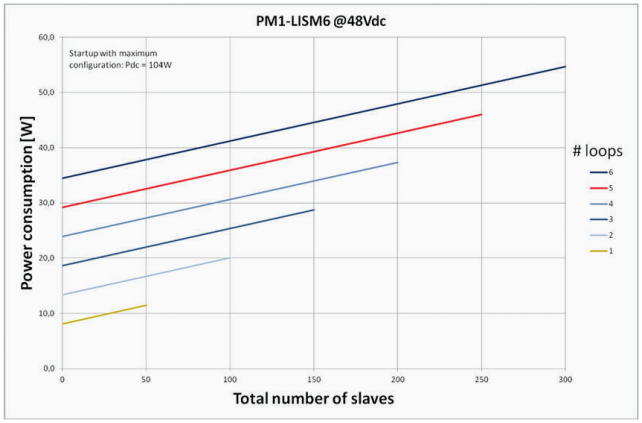
Mains power supply	
Voltage	115 / 230 VAC, ±10%, 50/60 Hz
Fuse rating	T6.3 A, 250 V
Inrush current	Time: < 10 ms; ≤ 30 A
Max. power consumption	150 W

Battery power supply	
Voltage	18 – 56 VDC nominal 24 or 48 VDC
Backup fault detection level	21 ± 1 VDC
Max. backup power current	4.5 A

Hardware Interfaces	
100 V audio I/O (loop 1-6)	Pluggable screw connector
Fault output (loop 1-6)	Floating contacts 24 V, 1 A
Fault relays except general fault relay	• OK state is normally de-energized • NO is open
General fault relay	• OK state is Failsafe, normally energized • NC is open (failsafe)

Performance	
Max. number of Isolator Boards in loop	50
Power handling capacity per loop	500 W
Frequency range	50 Hz – 20 kHz

Battery power consumption 24 V



Battery power consumption 48 V

Mechanical

Dimensions (H x W x D)	
For 19" rack use, with brackets	88 x 483 x 400 mm (3.5 x 19 x 15.7 in)
in front of brackets	40 mm (1.6 in)
behind brackets	360 mm (14.2 in)
Weight	15.9 kg (35.05 lb)
Mounting	19" rack
Color	Charcoal with silver

Environmental

Operating temperature	-5 °C to +55 °C (+23 °F to +131 °F)
Storage temperature	-20 °C to +70 °C (-4 °F to +158 °F)

Relative humidity	15% to 90%
Air pressure	600 to 1100 hPa

PM1-LISS

Electrical

Loudspeaker loop connection	120 VAC audio, max 5 A
Maximum loop though loudspeaker load	500 W
Maximum tap-off load	100 W
Test fault indicating LED	Yellow
Test button	Momentary

Mechanical

Dimensions (H x W x D)	78 x 60 x 32 mm (3.0 x 2.3 x 0.6 in)
Housing	150 x 150 x 75 mm (5.9 x 5.9 x 2.9 in)
Mounting options	• Ready mounted in the supplied housing • Mounted inside the loudspeaker • Mounted in an IP-65 housing (an optional mounting bracket LBB 4446/00 is required)
Weight	Approx. 180 g (6.3 ounces)
Color	Red
Fire-resistant properties	UL60065
Ingres protection	IP30
Punch out holes for cables	• 3 holes for 6 mm wires • 3 holes for 9 mm wires

Environmental

Operating temperature	-5 ºC to +55 ºC (+23 ºF to +131 ºF)
Storage temperature	-20 ºC to +70 ºC (-4 ºF to +158 ºF)
Relative humidity	15% to 90%
Air pressure	600 to 1100 hPa

End-of-line resistor

Electrical

End of line resistor	47 kohm, > 0.5 W resistor

PM1-LISD

Electrical

Loudspeaker loop connection X1, X2	120 VAC audio, max 5 A
Maximum loop though loudspeaker load	500 W
Tap-off X3	20 W on tap-off
High pass filter	67 Hz at 20 W load 34 Hz at 10 W load

Mechanical

Dimensions (H x W x D)	60 x 45 x 30 mm (2.7 x 1.8 x 0.6 in)
Mounting	Internally mounted in the loudspeaker (an optional mounting bracket LBB 4446/00 is required)
Weight	Approx. 16 g (0.6 ounces)

Environmental

Operating temperature	-5 ºC to +55 ºC (+23 ºF to +131 ºF)
Storage temperature	-20 ºC to +70 ºC (-4 ºF to +158 ºF)
Relative humidity	15% to 90%
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Ordering information

Loudspeaker Line Isolator System Master
Master Unit for the Loudspeakers Line Isolator System: creates six redundant loudspeaker loops, 500 watts per loop, maximum of 50 Isolator Boards per loop.
Order number **PM1-LISM6**

Loudspeaker Line Isolator with Housing
Isolator Board for distributing audio from public address/voice alarm system, via Master Unit, to loudspeakers.
Order number **PM1-LISS**

Loudspeaker DC Blocking Board
DC Blocking Board for DC blocking and over-current protection, must be installed in system if loudspeaker is not equipped with an Isolator Board.
Order number **PM1-LISD**

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