APPLICATION NOTE

Plena Voice Alarm System and the use of EOL detection

Introduction

The Plena Voice Alarm Systems offers a simple and easy to use way of loudspeaker surveillance based on impedance measurement. But although it surely has its benefits there are some limitations as well. One of the ways to overcome these limitations is applying the End Of Line detection board. These limitations do not affect the functioning of the system itself but might either cause some inconvenience or leave break of the loudspeaker cable in parts of the line, in general the end of the line, undetectable. Be aware that detection of cable short is NOT affected by his. The limitations:

- Too many loudspeakers on the line will not allow supervision of cable continuity up to the last loudspeaker on the line. This may be overcome by the Plena Dummy Load.
- Long cable length could mask the measured impedance due to cable capacitance and therefore affect supervision of cable continuity up to the last loudspeaker on the line. This may also be overcome by the Plena Dummy Load.
- With a mixture of loudspeaker loads on the line it is difficult to determine maximum number of loudspeakers and dummy load settings to allow supervision of cable continuity up to the last loudspeaker.
- When having a loudspeaker line with several branches it is not possible to supervise cable continuity in all branches with impedance measurement.
- Background music is interrupted during the impedance measurement.

General

The End Of Line detection board detects the presence of a pilot tone signal. When the pilot tone fails, this will open a normally closed contact. If mounted at the end of the loudspeaker line this means that the output contact of the EOL board indicates integrity of the whole loudspeaker line. Presence of the pilot tone will not depend on the amount of loudspeakers on the line, the load on the line and the cable capacitance.

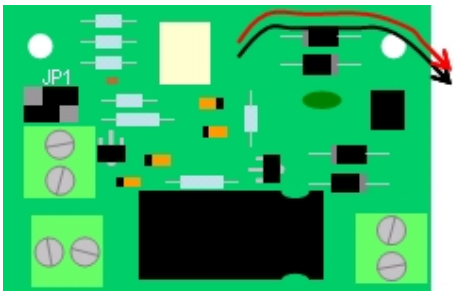
It is possible to connect several EOL boards in a daisy-chain configuration to a single fault input. This will allow monitoring of a loudspeaker line with several branches. However, do not connect the different EOL boards in a star configuration. Refer to the Known limitations and work-arounds for further details.

Since the background music also includes a 20 kHz pilot tone there is no need to interrupt background music.

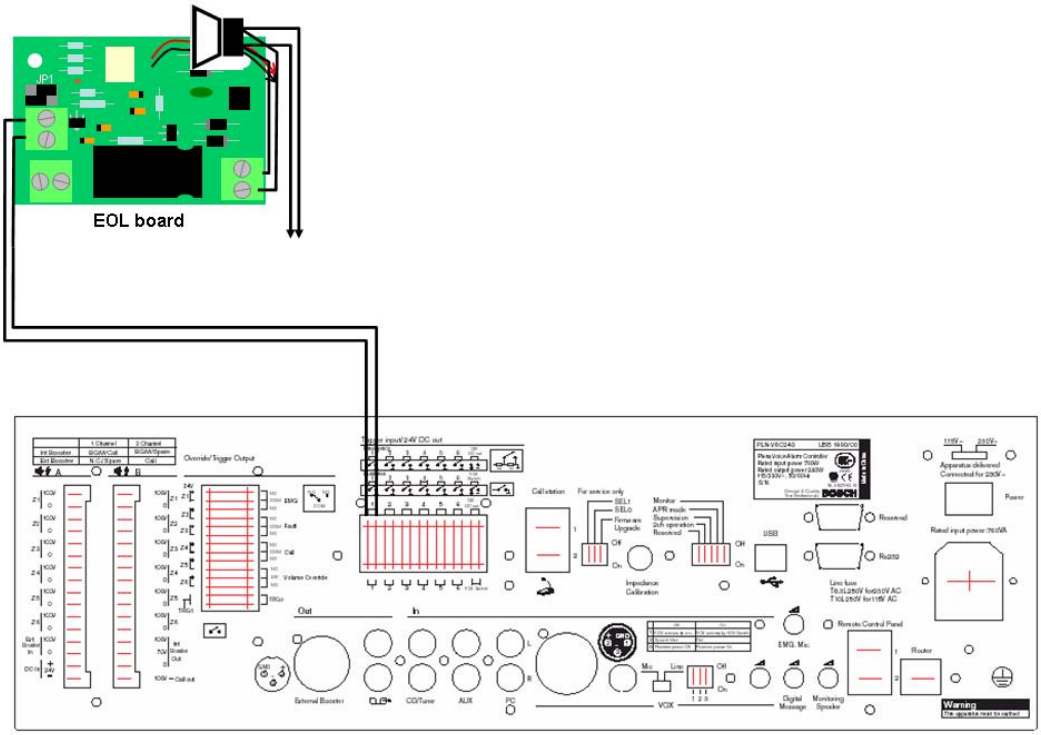
A red LED, connected to the EOL board, indicates presence of the 20 kHz pilot tone. The LED not lighting up does not necessarily means a failure. Please refer to Know limitations and work-arounds for further details.

Connecting a single EOL board

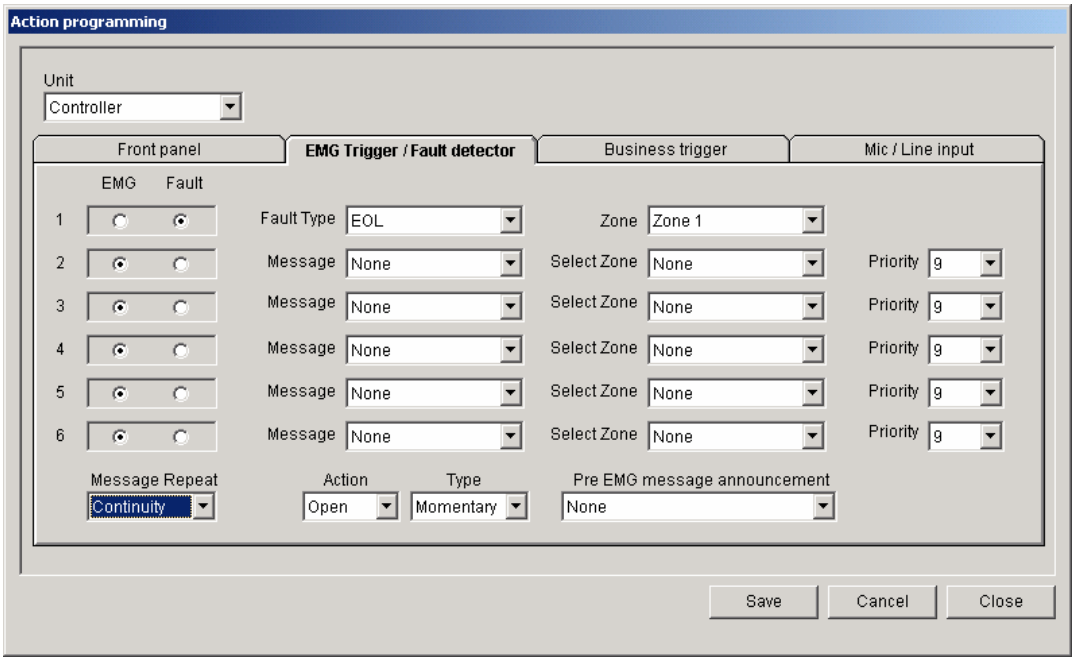
Connect the 100 Volt loudspeaker line to the terminal marked **100V LS Input** on the EOL board. Connect the fault output contact marked **TRGA** on the EOL board to an Emergency Trigger Input of the Plena Voice Alarm system. Connect the jumpers **JP1** as indicated below for supervision of the connection to the trigger output.



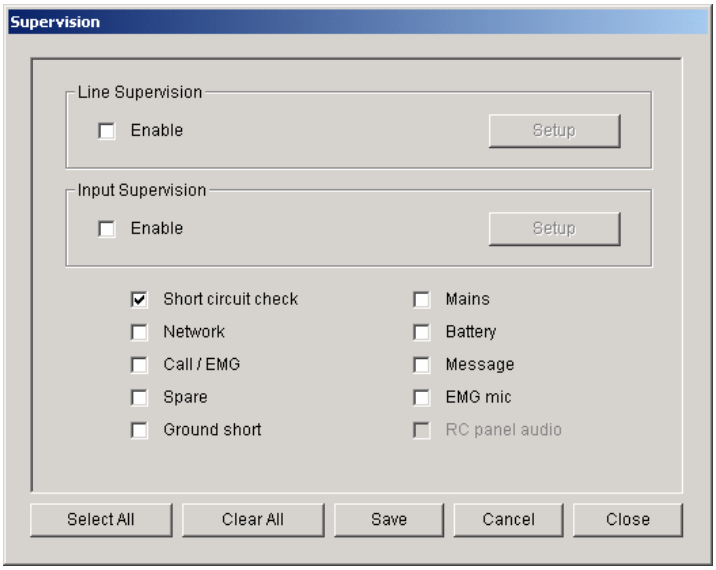
Connect the output of the EOL board to the Trigger Input as indicated below. This input should be on the Controller or Router to which the loudspeaker line it supervises is also connected.



In the configuration program set the Action Programming for the relevant input to Fault and EOL. Enter the zone that is monitored by the EOL board. Fault Type and Zone will define the visual indication on the unit in case of a fault. Set the Action to Open and type to Momentary.



Disable impedance measurement by unticking Line Supervision Enable, but enable Short circuit check.

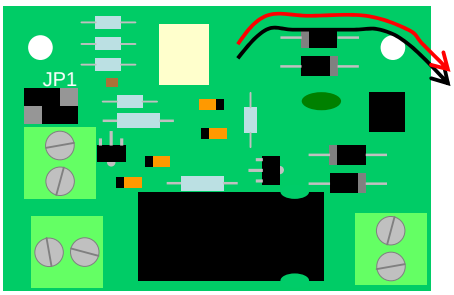


Daisy chain connection of EOL boards

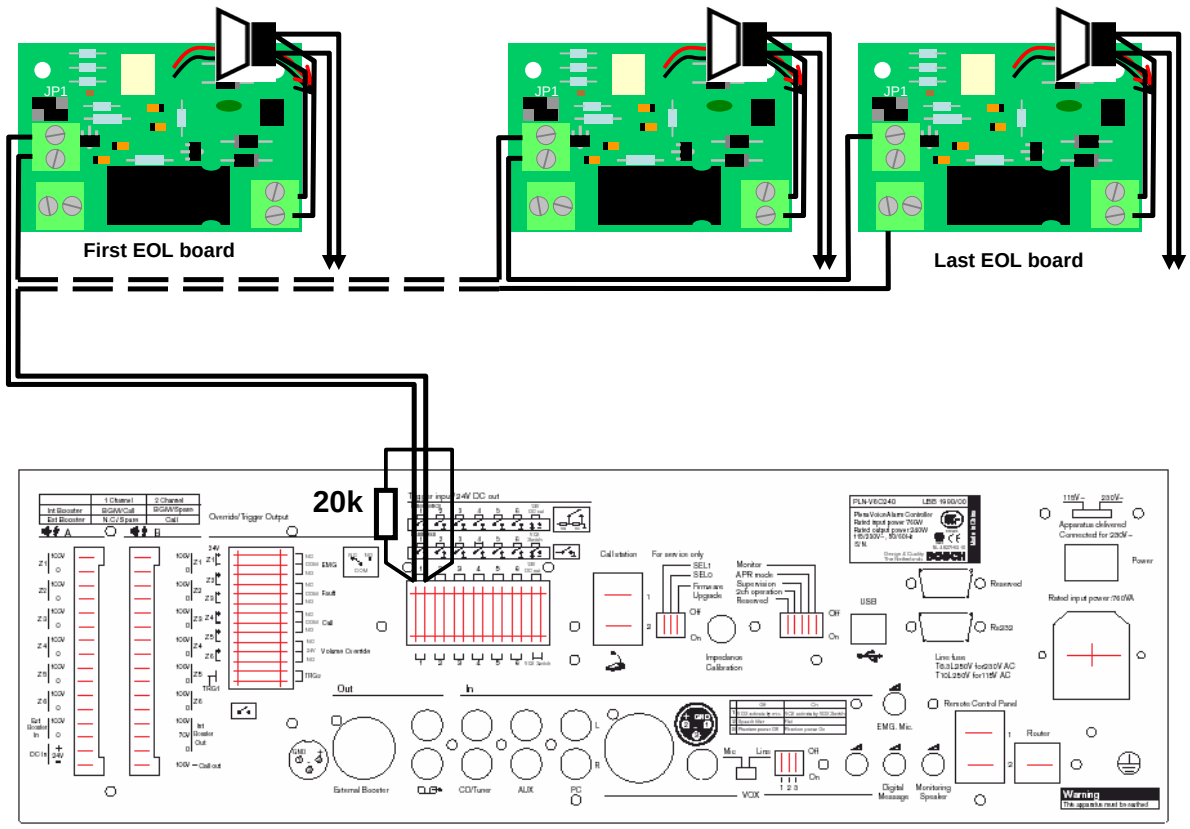
With a daisy chain configuration it is possible to:

- Supervise several loudspeaker lines with only one fault input.
- Supervise several branches of a loudspeaker line with just one fault input.

Connect the 100 Volt loudspeaker line to the terminal marked **100V LS Input** on the EOL board. Connect the jumpers **JP1** as indicated below to disable individual supervision of the EOL board.



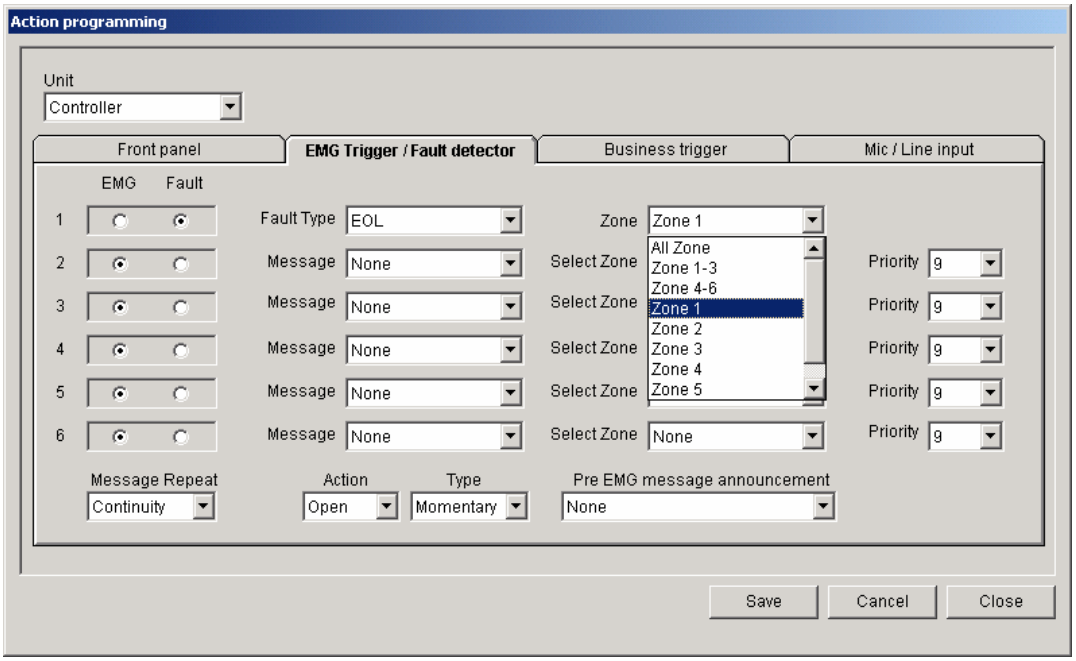
To connect more than one EOL board on a single trigger input and to supervise the EOL boards a 20 or 22 k resistor should be connected in parallel with the trigger input. Connect the EOL boards to the Trigger Input as indicated below. This input should be on the Controller or Router to which the loudspeaker lines it supervises are also connected.



Please take care that only the LAST EOL board in line is connected differently. This is required to supervise the whole EOL detection line against short circuit. Such a short circuit will be reported as an Input Fault. A break in the detection line will be reported as a Line Fault, just as a loudspeaker line failure will do. This means that in case of a Line Fault reported a qualified

engineer needs to determine the cause of this, for instance by checking the status of the LEDs on the EOL boards.

In the configuration program set the Action Programming for the relevant input to Fault and EOL. Enter the zone or zone group that is monitored by the EOL board. The zone group can be All Zones (of the Controller/Router), Zone 1-3 or Zone 4-6. Fault Type and Zone will define the visual indication on the unit in case of a fault. Set the Action to Open and type to Momentary.

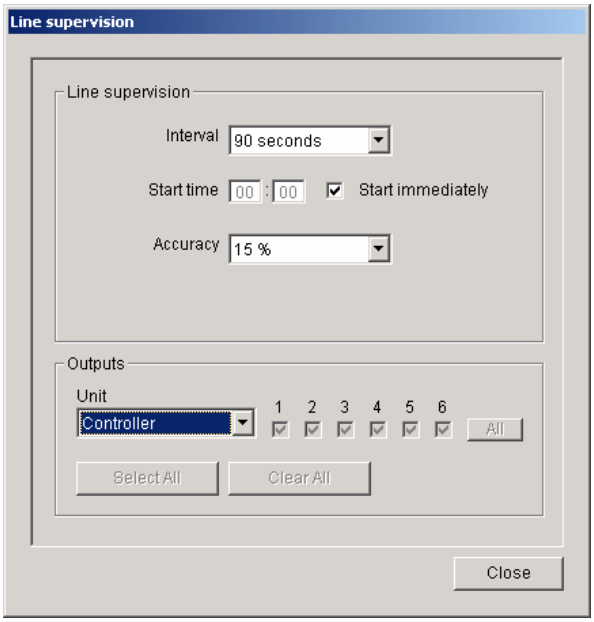


To determine which individual EOL board has detected a failure, please examine the red LED on the EOL board, but bear the remark in Known limitations and work-arounds in mind.

Known limitations and work arounds

- EOL boards can only be used in 2-channel mode, not in 1-channel mode, because it needs the second amplifier to produce the pilot tone for zones not in use.

- You cannot have impedance measurement and EOL supervision on one Controller or Router. If EOL supervision is selected on a Controller or Router the options to set the Line Supervision (using impedance measurement) is greyed out on this Controller or Router as indicated below.



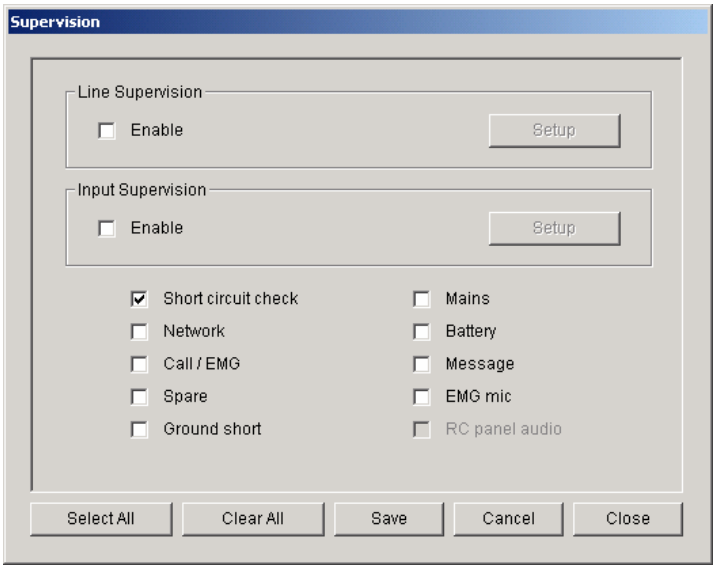
- When using BGM the volume controls on the Controller should be set to – 6dB or higher. If set lower, the pilot tone would also be attenuated and in such a degree that it will not be detected.

- Do not connect the EOL board to the secondary side of a volume control that could also attenuate the pilot tone.

- All emergency inputs of the Controller/Router to which the EOL board is connected should be set to Action Open. This implies that no normally open contacts can be connected to this Controller/Router. Connect such contacts to another Router (or Controller).

- When a call is going on the pilot tone will be absent in zones that do not have a call or background music. The red LED will dim. To avoid false fault readings the Voice Alarm System will ignore EOL board inputs during calls.

- Although the EOL board will detect a failure upon short circuit of the loudspeaker line it will not be able to isolate the shorted line. This can only be done by detection of a short circuit by the internal short circuit detector. For this you must enable Short circuit check in the Supervision setup as indicated below.



- It is not possible to connect multiple EOL board in a star configuration whilst having supervision of the detector circuit. A short circuit in an EOL branch would not be detected, This same short circuit would cause that EOL supervision in that branch no longer works.

- Although it is said that the EOL board should be connected to the end of the loudspeaker line, i.e. the last loudspeaker in the line, it is possible to mount the EOL board away from this last loudspeaker by extending the loudspeaker cable. This is allowed as long as it is not connected as a branch off the loudspeaker line. This could for instance make the LED better readable for service and maintenance purposes.