

# Checking line integrity

## Tone Detection in Armonia software: the integrity monitor tool (GPO)

### I Introduction

The integrity monitor tools (GPO) allows the end user to program and test the integrity of the input and/or output line. The input test is based on the detection of a pure tone (generated by an external generator) on any input line. The output test is based on the measurement of the impedance at a single frequency; since the amplifier can generate a pure tone and measure voltage and current at the tone frequency, it's possible to recalculate the specific impedance. When an alarms is detected the user can be informed of the event via software or directly from the amplifier.

The Integrity Monitor page can be found inside the Amplifier view, GPO tab, this tool in order to work must have the DSP enabled in the routing path of the amplifier.

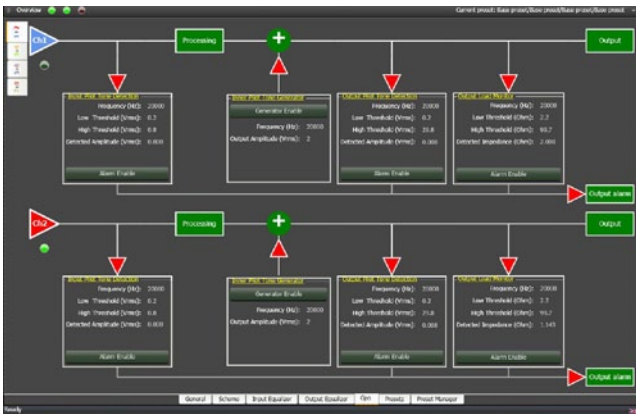


FIGURE 1: Armonia integrity line overview

## 2 Programming interface and alarm blocks

The input and the output sections can be programmed separately, those are logically divided by the processing section; this means that you can filter out the input tone, in order to avoid propagation to the output section. If an alarm is triggered this will be reported in Armonia in the following manner: one event (if selected) will be activated in the GPO page and blocks with an active alarm will turn red.

On the amplifier side an alarm will be reported as a blinking red light in the front panel. An alarm switch in the back of the amplifier will be also turned on in Duecanali and Ottocanali Series.

### I.1 Input Pilot Tone Detection

The input tone detection can measure the integrity of any input line of the amplifier, this detector can measure a tone applied by an external generator. In the GPO overview the input pilot tone block appears as in FIGURE 2.

This control shows threshold, frequency and amplitude of the measured tone.

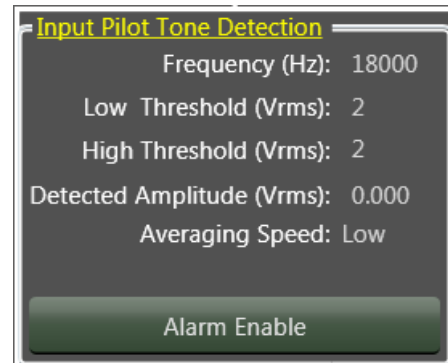


FIGURE 2: Input Pilot Tone Detection

NOTE: a suggested value for the tone generator is between 20 kHz and 24 kHz with the right processing to cut-off the tone before the output section.

Clicking on the yellow label will carry to the modal window, showed in FIGURE 3.

Here it's possible to program the following alarm values:

- ▶ The frequency of the tone that has to be detected (range 20 Hz - 24 kHz, steps of 10 Hz).
- ▶ The Low threshold, below that value the alarm is triggered (range 0 Vrms - 4 Vrms, steps of 10 mVrms ).
- ▶ The High threshold, above that value the alarm is triggered (range 0 Vrms - 4 Vrms, steps of 10 mVrms ).
- ▶ The alarm enable button.

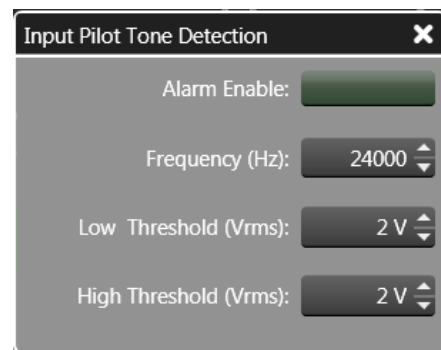


FIGURE 3: Input tone modal window

## 1.2 Output Pilot Tone Detection

The output tone detection can measure the presence of the tone generated by an external or internal generator. In the GPO overview the output pilot tone block appears as in FIGURE 4.

This control shows threshold, frequency and measured amplitude of the tone.

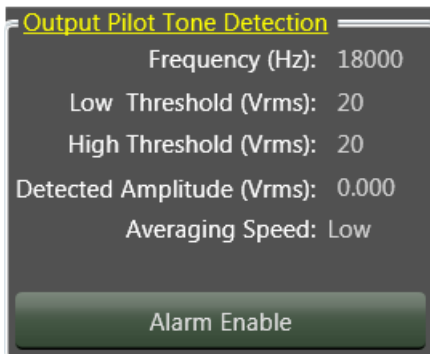


FIGURE 4: Output Pilot Tone Detection

Clicking on the yellow label will bring to the modal window, where it's possible to program the alarm values:

- ▶ The frequency of the tone that has to be detected (range 20 Hz - 24 kHz, step of 10 Hz).
- ▶ The Low threshold, below that value the alarm is triggered (range 0 Vrms - 20 Vrms, step of 1 Vrms ).
- ▶ The High threshold, above that value the alarm is triggered (range 0 Vrms - 20 Vrms, step of 1 Vrms ).
- ▶ The alarm enable button.

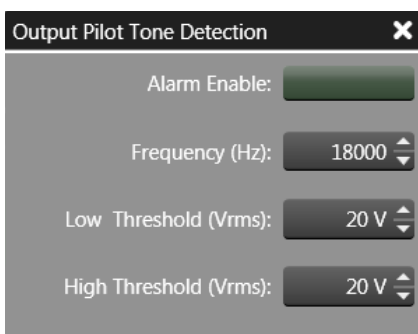


FIGURE 5: Output tone modal window

## 1.3 Inner Pilot Tone Generator

The inner tone generator allows the user to generate a tone used to check the integrity of the output line. This tone has to be used out of the band of the speaker in order to make it inaudible.

*NOTE: Typically a good value is between 20 to 40 Hz with an amplitude lower than 2 Volt.*

The tone generator block appears as in FIGURE 6.

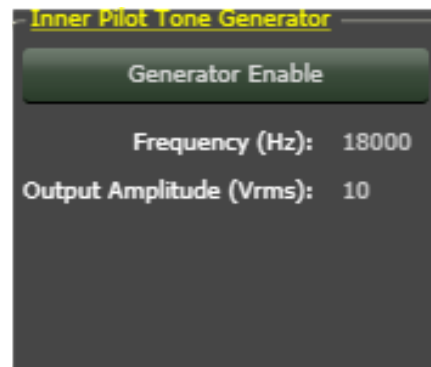


FIGURE 6: Tone generator

Clicking on the yellow label will lead to FIGURE 7 modal window, where it's possible to program the parameters of the generator:

- ▶ The frequency of the tone that has to be generated (range 20 Hz - 24 kHz, step of 10 Hz).
- ▶ The amplitude value of the generated signal (range 0 Vrms - 20 Vrms, step of 1 Vrms ).
- ▶ The alarm enable button.

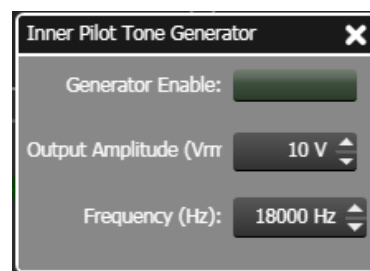


FIGURE 7: Tone generator modal window

## 1.4 Output Load Monitor

The output Load Monitor is used to detect the impedance load at a certain frequency. The high resolution algorithm allows an accurate measurement.

The control block appears as in FIGURE 8, showing the actual values of the block.

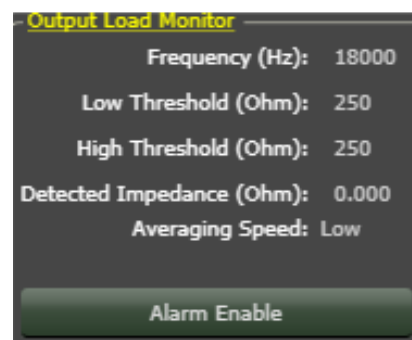


FIGURE 8: Output Load Monitor

Clicking on the yellow label will bring to the modal window, where it's possible to program the alarm values:

- ▶ The frequency of the tone that has to be detected (range 20 Hz - 24 kHz, steps of 10 Hz).
- ▶ The minimum impedance threshold value allowed (range 0 Ω - 500 Ω, steps of 0.1 Ω).
- ▶ The maximum impedance threshold value allowed (range 0 Ω - 500 Ω, steps of 0.1 Ω).
- ▶ The alarm enable button.

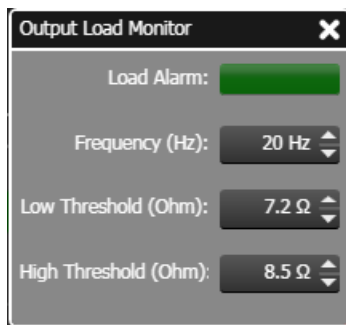


FIGURE 9: Output Load Monitor modal window

### 3 Configuration example

#### 1.5 Stereo input, monitoring both input/output lines

In this case the user will monitor both the input and output lines.

The boundary conditions are:

- ▶ Input Tone detection @ 18 kHz, amplitude of 60 mVrms at the amplifier on input channel 1.
- ▶ Input Tone detection @ 18 kHz, amplitude of 50 mVrms at the amplifier on input channel 2.
- ▶ Tone detection of output channel 1 @ 40 Hz, steady impedance of the line 90 Ω.
- ▶ Tone detection of output channel 1 @ 20 Hz, steady impedance of the line 5 Ω.



FIGURE 10: GPO Stereo input, monitor input/output lines

#### 1.6 Input from channel 1, monitoring input Channel 1 and both output lines

In this case the user want monitor just the channel input line 1, and both the output lines.

The boundary conditions are:

- ▶ Input Tone detection @ 18 kHz, amplitude of 60 mVrms at the amplifier on input channel 1.
- ▶ Tone detection of output channel 1 @ 40 Hz, steady impedance of the line 90 Ω.
- ▶ Tone detection of output channel 1 @ 20 Hz, steady impedance of the line 5 Ω.

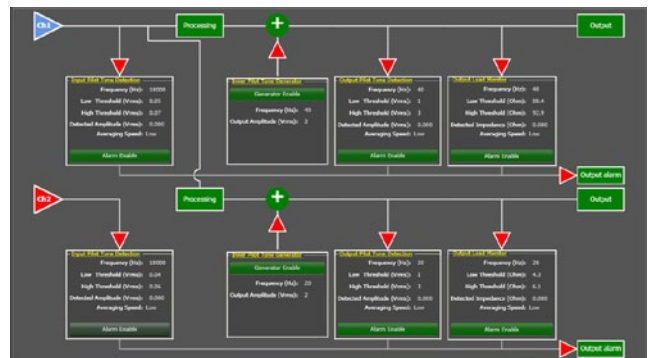


FIGURE 11: GPO ch 1 input, monitor input ch 1 and output lines



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