



PA3000

USER MANUAL

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I. INTRODUCTION

PA3000 is a versatile, three-channel conditioner designed to interface with sensors made in the IEPE standard.

Thanks to its small size and weight, robust design, very good operational parameters and ease of use, it is ideally suited for carrying out measurements both in the laboratory and in the field.

The conditioner is equipped with input circuits enabling powering up the IEPE sensor, while maintaining wide frequency response, very good linearity and low noise. Is also equipped with LEDs indicating open or short circuit in the sensor loops.

Each channel allows independent gain setting (1x, 10x or 100x) and enabling 1 kHz low pass and 10 Hz high pass filters.

The device can be powered up either by an adapter or an internal NiMH battery.

II. SPECIFICATION

Specification	
number of channels	3
input type	IEPE 24V DC / 2,4 mA
input / output connector	BNC / BNC
input impedance	100 k Ω
output impedance	1200 Ω
gain	1x (0 dB), 10x (20 dB), 100x (40 dB)
gain error	< 0,5 %
gain drift	< 50 ppm / $^{\circ}$ C
output range	\pm 10 V
distortion	< 0,1%
offset	< 10 mV
SNR	> 90 dB (10 Hz – 22 khz)
frequency range (- 3 dB)	0,5 Hz – 100 kHz *
low-pass filter	1 kHz, 12 dB / okt
high-pass filter	10 Hz, 12 dB / okt
LED indicators	On / off open / short sensor circuit over range selected gain charging enabled filters
power supply	12V DC/400 mA
batteries	Built-in Ni-MH battery, operating time approx. 10 hours

*) optional 300 kHz

III. DESCRIPTION OF THE PA3000 CONDITIONER



Figure 1 » View of the PA3000 conditioner

The Fig. 1 shows the panel of the PA3000 conditioner. There are five functional areas marked blue color. These areas include LEDs and buttons in light blue, contrasting with the dark blue background.

The power area contains a red LED signaling power on/off (11), power button and a yellow LED signaling charge (10).

The input area includes the yellow open (1) and short (2) LEDs. They are grouped in columns marked 1, 2 and 3, corresponding to the conditioner inputs. BNC inputs (9) are placed on the rear wall of the casing so that the symbols 1, 2 and 3 clearly indicate the corresponding connector.

The gain area includes yellow LEDs signaling overload. Underneath there are red LEDs arranged in columns indicating currently selected gain level: 1x, 10x and 100x (3, 4, 5), and the buttons used to make the selection.

Positioned below there is the filters area containing buttons used to control highpass and (6) and lowpass (7) filters. Above the buttons there are red LEDs indicating activity of the filter.

At the bottom of the panel there is the output area (8). Figures 1, 2 and 3 indicate corresponding output channel connectors. The connectors are located on the front of the chassis.

All the LEDs, buttons and connectors are arranged in columns to indicate clearly the corresponding channel.

The following table lists the panel components with their descriptions:

Item	Function	Description
red LED <i>power on/off</i>	signaling device activation	<ul style="list-style-type: none"> continuous light indicates that the unit is on Flashing LED indicates the need to recharge the battery pack
yellow LED <i>charge</i>	signaling charging the batteries	continuous light when charging
yellow LED <i>open</i>	signaling a break in the sensor circuit	flashes when the sensor is not connected or there is a break in the circuit
yellow LED <i>short</i>	indication of short-circuit	flashes in case of short-circuit in the sensor loop
yellow LED <i>overload</i>	indication of overload	continuous light when the output voltage exceeds the range of +/- 10V
Red LED: <i>0dB</i> <i>20dB</i> <i>40dB</i>	indication of the selected gain	continuous light indicates the currently selected gain level for the channel
Red LED: <i>highpass</i> <i>lowpass</i>	signaling filter's activation	continuous light indicates that the filter is active
the <i>power on/off</i> button	conditioner switch	press to turn on the device, pressing again will turn it off
the <i>gain</i> button	selection of gain level	sequentially switched to select gain level: 1x - 10x - 100x on a given channel

Buttons: <i>highpass</i> <i>lowpass</i>	enabling filterss	pressing the button activates the filter pressing again will turn it off
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Tab.1 » LED Indicators and Buttons conditioner PA3000

IV. POWER SUPPLY

Conditioner PA3000 can be powered from the AC adapter supplying 12V DC or internal NiMH battery. The fully charged battery allow working for approximately 10 hours. When the external power supply is used, the internal battery is recharged if necessary. Built-in charger automatically prevents overcharging the battery.

WARNING!

Do not leave the conditioner unused for a long time with a discharged battery. This may result in loss of capacity.

V. USING THE CONDITIONER

V.1. SWITCHING ON

Before starting, connect the conditioner with sensors and measurement equipment using shielded cables.

After connecting the inputs and outputs of the conditioner, turn it on by pressing the power on/off switch on the panel. The *power on/off* LED button should flash to indicate battery power. For approximately 5 seconds the *open* and *short* LEDs will also blink, while the *overload* LED will illuminate continuously. Pressing the *power on/off* button will disable the device.

When conditioner is connected to the AC adapter, it automatically turns on. The power on/off LED's steady light indicates power from an external source. If the battery is not fully charged, the internal charger will start the process of charging, signaled steady light of the charge LED.

The power on/off button does not affect the operation of the conditioner with external power supply connected.

V.2. GAIN LEVEL SELECTION

For each channel of the conditioner it is possible to select one of the three gain values: 1x (0 dB), 10x (20 dB) or 100x (40 dB). The gain selection is made by pressing the button corresponding to each channel, resulting in a sequential change in the gain level: 1x - 10x - 100x. The selected value is indicated by steady light of the corresponding LED.

V.3. ENABLING FILTERS

For each channel of the conditioner it is possible to enable high pass filter and low-pass filters. The activation of the filter is done by pressing the corresponding button on the panel. Activation of the filter is indicated by the red LED over the button. Pressing the button again turns off the filter.

VI. TROUBLESHOOTING

Table 2 provides the solution to some problems that you may encounter during the operation of the conditioner.

Problem	Solutions
The unit will not turn on	The cause maybe an empty battery, connect the AC adapter to the conditioner in order to charge the battery
No signal on the conditioner output	Check if either of the <i>open</i> or <i>short</i> LEDs are blinking, if yes - check the connection of the sensor(s) to the conditioner and make sure that the sensor cables are OK - any breaks, cuts and abrasions qualify them to be replaced. Make sure that the sensor(s) are operational.
Output signal conditioner is noisy and/or disturbed	<ul style="list-style-type: none"> • Make sure that the signal cables used to connect the sensors and the measuring equipment are shielded cables • Make sure that nearby there are no electrical devices turned on, that may interfere with the operation of the conditioner • Disconnect the AC adapter from the power conditioner and power it up with battery - in some cases, excessive noise can penetrate from the network through the AC adapter and affect the operation of the conditioner

Tab. 2 » Problems and possible solutions

If the above table does not include the problem or given solution has been unsuccessful, contact EC Systems service.



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