

PowerPROview

Power Analyzer Pro

How to Guide

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Introduction

This manual deals with a Power Analyzer Pro connected to the PowerPROview software. For information on operating the PowerPROview software see the PowerPROview Users Manual.

The Power Analyzer Pro is a great field tool that helps you check your setup and batteries. The Power Analyzer Pro Manual shows various means of using the Power Analyzer Pro as a stand alone meter. With the PowerPROview software you can connect your Power Analyzer Pro to your computer and obtain real-time data information for recording and graphing. The PA Pro can also be used to control an ESC for repetitive testing.

Real-Time Data

Once the PA Pro is connected to the Computer and PowerPROview you can start real-time data streaming from the PA Pro to the computer by clicking on the Start Data




Streaming button . Clicking it again will stop the data streaming. While data is streaming you can view the data using the various data objects that you can place on a data view (see the PowerPROview software users guide for creating a data view). With real-time data streaming you can also record and graph that data (see the Power Analyzer II Software User Guide).

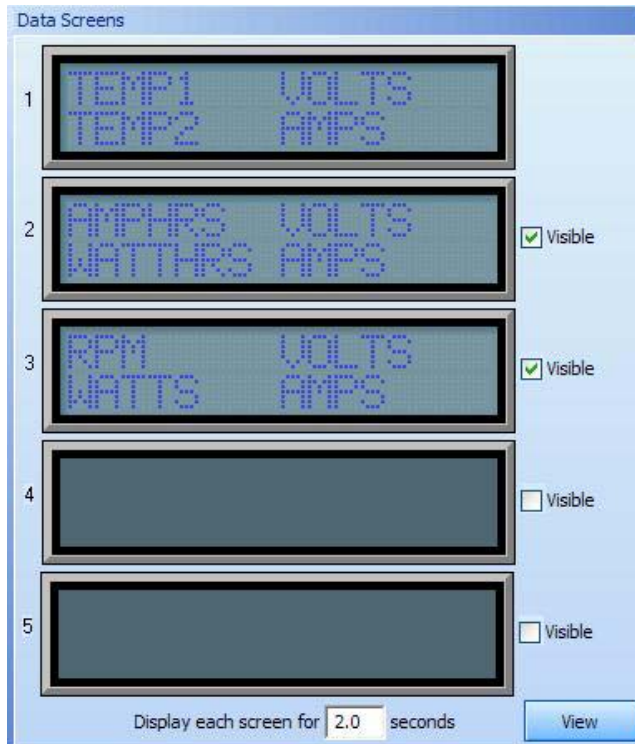
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Changing the Display Layout

The position and values displayed on the LCD screen of the PA Pro can be changed to your liking. Use the PA II Configuration button  to bring up the configuration screen. When the configuration screen opens it reads the current configuration information from the PA II and displays those values.

Click on the Data Screens tab to get the screen configurations:



You can configure up to five (5) screens with the different data values available and the rate at which the screens change. Right click on one of the four data positions to select the data value to display in that location or no value.

Set the number of seconds that each screen should be viewed for and click the




Write Configuration to PA Pro button to send the new configuration to the PA Pro.

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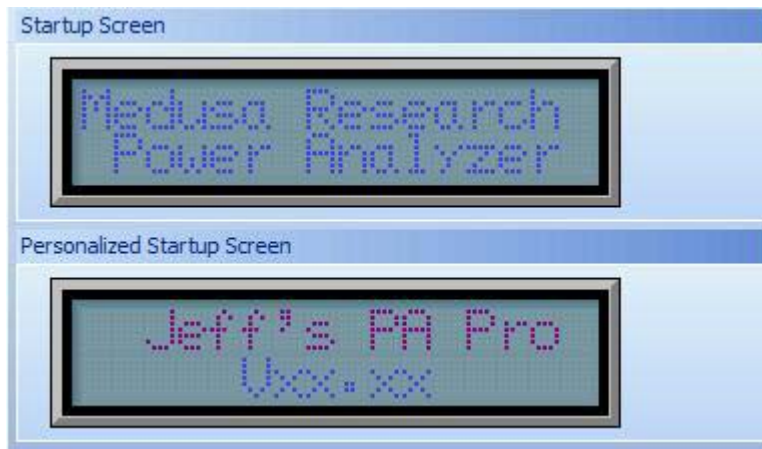
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Customizing the Startup Screen


When the PA II powers up the first screen shows the company name and then a second screen displays showing the firmware version on the bottom line. The top line can be customized to say whatever you want up to 16 characters. You put your name or favorite phrase to indicate that it is your PA II.

Use the PA Pro Configuration button  to bring up the configuration screen. When the configuration screen opens it reads the current configuration information from the PA Pro and displays those values.

Click on the Startup Screen tab to get the screen configurations:



Double click on the first line and enter the text of your message and click ok. Right click to select options for: Center Justify, Left Justify, Right Justify, Upper Case, Lower Case, and Proper Case.

Click on the Write Configuration to PA Pro button  to send the new configuration to the PA Pro. The next time the PA Pro starts up you will see your new personalized screen.


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Using the RPM Phase Sensor

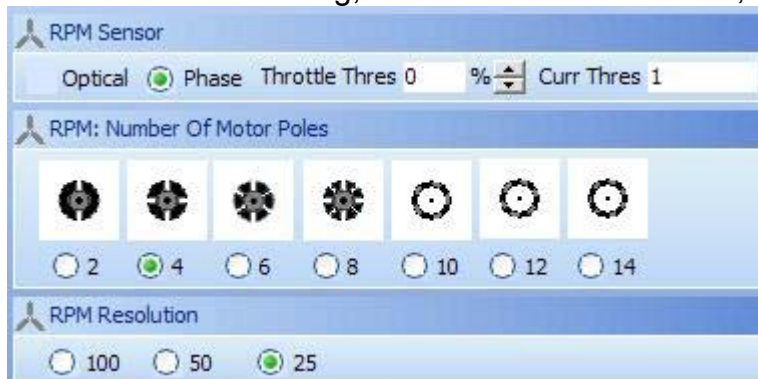
The RPM Phase Sensor is very useful in measuring the RPM of a motor by just connecting to one of the motor wires.

To use the sensor you must first configure your PA Pro for the phase sensor.

Click on the PA Pro Configuration button  to bring up the configuration window and click on the General Settings tab.



Select the Phase setting, set the Throttle Thres to 0, and the Curr Thres to 1.



Select the number of magnetic poles of the motor so that the RPM reading will be calculated correctly.

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Select the RPM resolution setting that best fits your setup. Note that the higher the resolution (i.e. the smaller the number) the slower the readings will be updated. Typically the 100 resolution is accurate enough and provides the fastest updates.



Click on the Write Configuration to PA Pro button to send the new configuration to the PA Pro. The next time the PA Pro starts up you will see your new personalized screen.

NOTE: If you are seeing spurious RPM readings with the throttle off, adjust the Curr Thres upwards until the sporadic readings are eliminated. The Curr Thres sets the level at which RPM readings are enabled. At low RPM or when off, an ESC can generate waveforms (i.e. brake signals) that can be mistaken for motor control signals and produce erroneous RPM readings.

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Using an ESC

One of the most important features of the PA Pro is its ability to control an ESC. This allows the computer to adjust the throttle in a repetitive manner that allows for a much better comparison of test results rather than controlling the throttle by hand.

When selecting an ESC to connect to the PA Pro keep in mind that the higher the number of steps the ESC has the better the data results. If one ESC only had say only 64 steps, where another one had 200, then the second one will give a smoother change over the throttle range than the first one with 64 steps.

The ESC connects to the ESC port on the PA Pro making sure to connect the Black (or brown) wire such that it is to the right lining up with the “B” on the ESC port legend.

Use the ESC toolbar and click on the Edit Waveform  button to open the waveform screen.

The first step is to calibrate the range of control that the ESC accepts. The standard control signal is 1ms to 2ms but most ESC's do not always accept the full range.

Configuring the ESC Throttle Range

NOTE: Make sure that whenever you power up a motor that it is secured so that it will not move. If you have a prop attached make sure that it is secured to the motor shaft. You should always enclose your motor with a prop in a safety cage and wear eye protection.

With the ESC powered up and connected to a motor (preferable without a prop at this time), click on the Enable Real-Time checkbox. This enables the slider at the bottom as the throttle control. Slide the real-time control up some to make sure the ESC is responding. Once it responds, return the real-time slider to 0. Increase the Min Offset slider until the motor just start to move (i.e. or sing/shine) indicating that the ESC is trying to move it, then move the Min Offset down once notch. Next, slide the real-time control to the far right position (max). Adjust the Max Offset down until the motor just start to change speed and then move it up one notch. You have now adjusted the ESC controls for your ESC's throttle input range. Make sure you uncheck the Enable Real-Time button when done.



Open Real-Time Control



Close Real-Time Control

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Using an ESC Waveform

An ESC waveform is just a pattern that the throttle position will follow. You can define various parameters for different waveform types to customize a waveform for your testing. Select the waveform of your choice and adjust the parameters as needed.

NOTE: While an ESC waveform is running pressing the Escape key on your keyboard will stop the waveform and the motor as will the Stop button.

Checking that all safety measures are in place, click the start button



to begin the waveform control. The waveform will be applied to the throttle and the ESC and motor will respond accordingly.

When the waveform starts, data recording will also start if the Auto Record check box is checked.

Once the waveform has completed the motor will stop. If you recorded the data, save it for future reference and graphing.