

# RIGEXPERT ANTENNA ANALYZER: AN OVERVIEW

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I was in the market for quite a while looking for an antenna analyzer that would suit my needs both as an Amateur Radio operator and as professional electronics engineer. I had read tons of information and reviewed dozens of models when finally I came across the RigExpert AA-230PRO Antenna Analyzer.

In addition to all the features that it offers, this analyzer can be used portable, and can be purchased from a Canadian company that I even could visit in person and take a look at the instrument beforehand. I purchased an AA-230PRO from RigExpert Canada ([www.rigexpert.net](http://www.rigexpert.net)) and Yuri, VE3DZ, the RigExpert representative in Canada, kindly offered me his assistance.

The device comes in a nice strong cardboard box with a charger, USB cable and portable case with strap which allows you to put the meter on your neck while working up a tower. The real beauty is the detachable 4.8 V Ni-MH rechargeable battery – just compare it with a half-dozen AA batteries for other analyzers!

The main features of the instrument are: portable design, user-friendly and intuitive interface, accurate SWR and load impedance measurements with the ability to distinguish sign of reactance, e.g., it tells you the difference between capacitance and inductance.

Time Domain Response (TDR) function is integrated into AA-230PRO. This function makes the instrument able to calculate and display on the LCD the distance between the cable connector and a problem in a transmission line. The nature of the problem can also be determined by just analyzing the response pattern. This is indeed a very great and useful tool.

Another great feature of this instrument is MultiSWR Mode. It gives you a unique ability to display SWR for up to five different frequencies at a time. This function would dramatically facilitate tuning of trapped multiband antennas. In real time you can monitor how the settings for other bands are affected when you adjust a trap for a particular band.

Not impressed yet? Here's another unique feature, SWR2Air Mode, which is designed to help in adjusting antennas connected

via long cables. This procedure usually involves two persons; one adjusting the antenna and the other shouting out the SWR value as it changes at the far end of the feedline. There is an easier way to do the same job now, just by using the SWR2Air mode. The result of the SWR measurement is transmitted on a user-specified frequency where it can be heard with a portable HF or VHF FM radio. The length of audio signal coming from the loudspeaker of the portable radio depends on the value of measured SWR.

While tuning a KT-34 antenna, I compared the AA-230PRO SWR readings with my IC-7600 and Daiwa CN-801HP SWR meters. The AA-230PRO demonstrated a perfect match with its Japanese colleagues. Our VE3YAA club QTH is surrounded by huge broadcasting antennas transmitting big kilowatts. And here came another great feature of AA-230PRO: I have found that the instrument has strong immunity against RF interference (unlike the MFJ analyzer, on which the SWR measurements depend on the antenna's azimuth).

During our preparations for the RAC 2009 Winter Contest it took just a few minutes to erect a "Field Day" style 160m dipole and 80m delta loop antennas and tune them into the middle of the CW part of the band.

The AA-230PRO comes with a CD that contains not only drivers, but also original software called "AntScope". This software allows you to use the Analyzer with your PC so you can store your data, draw graphs, etc. I tested instrument's abilities to interface with PC via USB interface. The AntScope program was capable of downloading and displaying data from the instrument such as SWR, Return Loss, Phase Angle, Impedance components and TDR. You can save your antenna data and track its performance over time.

When analyzing schematic diagrams that I downloaded from the RigExpert website, I realized that the instrument has extensive battery power management. For example, the LCD backlight and the RF amplifier are supplied with power only when needed. This makes the battery pack last through a couple of days of antenna tuning and adjustment. The design of the AA-230PRO is really professional. For example, it contains such modern components as the

AD5899 two channel DDS and the AD8302 detector. The PCB is being manufactured with very high quality.

All in all, I am extremely pleased with the professional and lightning fast support provided by the RigExpert team. My input regarding the instrument's improvements was responded to almost immediately by the instrument's designers. As a result, firmware and program updates were released the next day! By the way, all documentation, software and drivers are available for download from the Rig Expert website.

In fact, the only suggestion that I would make to improve the analyzer is to do with the fact that the analyzer is based on the AD8302 – broadband logarithmic detector of amplitude and phase components. This detector makes the analyzer very compact, but somehow reduces its accuracy and results in some readings instability in "Show all" mode. Despite this, the overall accuracy of the instrument is high enough for Amateur's antenna tests and most professional applications. It would be beneficial to expand the range of R,X graphs from +/- 200 Ohm to +/-1000Ohm.

In conclusion, I would say that the AA-230PRO is a great handheld antenna analyzer which is absolutely sufficient to tune Amateur Radio antennas within the 100 kHz to 230 MHz range. You won't be disappointed. The instrument is definitely not cheap, but the price is reasonable, considering its value. And if you are into antenna building or the RF applications business, you definitely need a device like this. You may also consider buying one for the club and sharing it among your club members.

In addition to the AA-230PRO, RigExpert Canada currently offers other models of Antenna Analyzers including the AA-230, which is similar to 230PRO, but does not have TDR function and costs less, and the AA-520 (with frequency range from 1 to 520 MHz).

I am not in any way affiliated with Rig Expert, just a fully satisfied customer who is happy to say that the instrument is worth every cent.

