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Checking it Out

On the Road with the DEVA RE II

By Richard Rudman

[October 2014] In recent years, most all the test gear broadcasters use has seen improvements to better analyze and display a station's RF and audio. As Richard Rudman explains, the DEVA Radio Explorer II is a good example of what can be put in a small but powerful package.

There is an old saying that goes something like this: You can never be (1) too beautiful/handsome or (2) too rich.

For broadcast engineers (1) does not really help us and (2) is not a likely outcome in our profession. But, there is another "too" that broadcast engineers can certainly identify with: You can never have enough good test equipment.

A recent addition to my personal collection of test gear is the DEVA Radio Explorer II (RE II). The RE II can do a number of broadcast FM measurement engineering tasks that will help you work more efficiently and produce valuable results for your employer or clients.

THE DEVA RE II

So, exactly what is a DEVA RE II and what can it do for you?

The DEVA Radio Explorer II

Like its rack-mounted relative, the DEVA 4004, the RE II is an FM modulation monitor on growth hormones – and more. The RE II can log and show a panoply of FM broadcast parameters and display them referenced to real time GPS coordinates on a map.

While there are other devices that can do this, the DEVA RE II definitely is worth a look. It is a cost effective device that is easy for you to learn, set up, and carry out detailed evaluations of FM signal coverage.

SMALL BUT POWERFUL

The RE II is portable – just 8" wide by 9" deep by 3" high. For backpacks or other tight places you should allow for another 2" to 3" of depth for connectors.

The unit is easily powered from any stable 12-Volt DC source, ranging from a battery to an inverter, converter, or 12-Volt outlet on your vehicle. Since it is does not have an AC connector, you will have to supply your own 12-Volt DC power supply when you bring it in from the field to review and export data.

The RE II has a number of connectors for such a compact device. Two separate software selectable antenna input BNC's, the DC power connector, the GPS antenna connector, a USB port, an Ethernet connector, a DB9 connector for GPO use and, finally, three XLR male connectors for separate left, right, and AES/EBU output.

FAMILIAR CONTROLS

The RE II front panel controls and display will be familiar to anyone who has used the DEVA 4004 modulation monitor. In fact, the RE II built-in GUI (graphic user interface) and DEVA application looks, feels, and works just like the GUI for the 4004.

Talking to the RE II using a computer lets you do all the setup tasks on the front panel but with more ease and graphic feedback. A PC application called DEVA Device Manager is used to manage the system as well as export survey data to Google Earth. You can use the built-in, web-based GUI by simply entering the IP address in a Mac or PC browser.

REII front panel showing software login

In fact, DEVA's display and control standardization across devices could be used to advantage by a lot of equipment manufacturers to make life easier for their users.

TWO WAYS TO DO IT

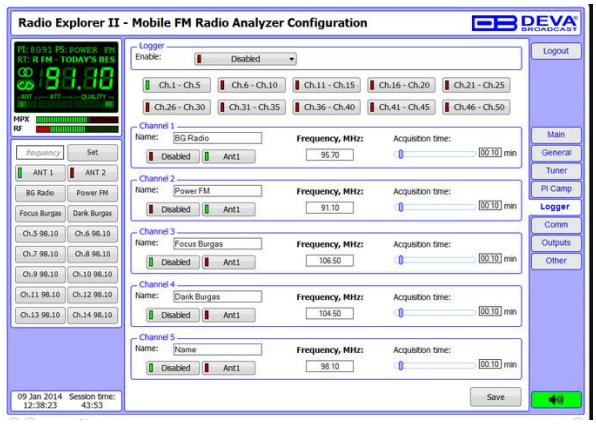
To show how it works, for example, let us take a walk through setting up the logger feature using the front panel and the GUI.

After applying power, press the "OK" button to see the Main Menu options. Then, you then "right arrow" to the SETTINGS icon and press "OK" again.

The RE II Main menu

Then, you "down arrow" to LOGGER and press "OK" again. You use the "down arrow," "right arrow," and "OK" keys to set the logger time interval, the CHANNEL, frequency, and BNC antenna port.

With the GUI, you just click on the LOGGER page where you can activate or turn off the logger function and carry out the other settings.

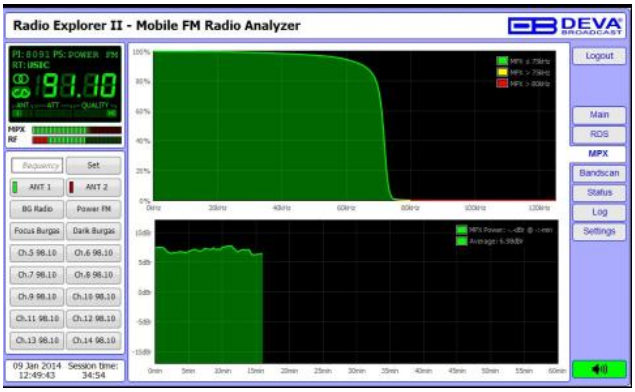


LOGGER SETUP OPTIONS

Once the RE II is set up for logging, it is ready to go on the road, trail or helicopter (of course installed with an FM and GPS antenna installed by an FAA-certified airframe mechanic).

DEVA supplies an antenna that can go on a roof or any surface that can attract a magnet. It has an adjustment so the element can be set for vertical even if you mount the base on a horizontal surface.

The RE II can perform two types of surveys, LOGGER MODE or PI/CALL CAMPAIGN mode. The LOGGER MODE is used for on-field configuration and observation of one or as many as fifty multiple preselected frequencies.



The RE II GUI screen showing occupied bandwidth and multiplex power over time

The PI/CALL CAMPAIGN MODE uses the PI/CALL (RDS information) for performing up to ten complete station surveys.

Offroad you can use the supplied antenna or use any antenna you can conveniently and securely mount to give you relative field strength measurements (Of course, all measurements made with the DEVA RE II – or any survey system – are relative unless a calibrated and certified antenna is used.)

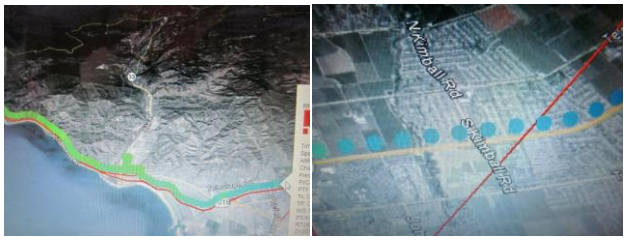
Once you program the RE II for a survey, all you have to do is connect the antennas and apply DC power. The RE II will take readings at the intervals you set until you turn it off or disable the logging function.

This means that you can have anyone with a valid driver's license (or a willingness to hit the trail) do the tedious task of following directions to compile data. For aerial surveys the RE II could accumulate data on its own once secured by an A & P mechanic.

DATA DISPLAY

Once you do a survey, DEVA's software lets you export to Google Earth®.

Here are a couple of examples: one is of an export showing most of a survey path and another showing how the individual data points display when you zoom in.



From the second display, you can click on any data point and view measurement details.

FRONT END CARE

There is one important caution about where you can "plug it in:"

As the RE II is not designed to handle high RF voltage samples found on most transmitters, I purchased several power attenuators to protect my RE II's front end.

That said, I have found that the DEVA RE II, like the DEVA 4004 rack mountable modulation monitor, provides me with reliable readings at transmitter sites using the supplied antenna.

As I noted in my report on the DEVA 4004, you can make accurate off-air measurements at a multi-transmitter site. The receiver selectivity and immunity to undesired FM signals for the 4004 and the RE II is amazing.

The front panel multipath reading lets me orient the antenna for best results.

READING OUT THE DATA

Here is a tip to get at the data more easily: while the RE II will connect to a network using DHCP or by entering fixed IP information, the simplest way to "talk" to it is with an Ethernet crossover cable or crossover adapter for a standard network cable.

Ethernet crossover adapter in place

If you do set up the wired Ethernet settings for your PC or Mac using common settings on the same subnet, you do not need to carry a router with you for field operations.

PUTTING IT TO USE IN THE FIELD

The RE II has helped me do several on the road surveys on major routes in Southern California for a client that has a growing single frequency network on 104.7 MHz.

Overall, I have found the setup to be fast and reliable, and the process for reviewing the data on Google Earth is straightforward. Like my AMEX card, I now do not go anywhere without my RE II.

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