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Dam Safety in 3D



Champion's nV3 Network Rover

A newcomer on the GPS equipment scene is Champion Instruments. Champion provides precision positioning equipment to engineering, construction, and agricultural industries. Their stated goal is to provide high-performing equipment at the lowest possible prices. Some of their products are the nV3 GNSS network rover, the TKO base + rover RTK system, and the Scepter field controller.



Figure 2

For this review I'm using the nV3 with the Scepter loaded with Carlson SurvCE. I also have a demo version of MicroSurvey FieldGenius on the Scepter, so I'm running the nV3 with that, as well. For network service, I'm using the eGPS VRS network in Georgia and the SCGS VRS network in South Carolina.

Weighing less than three pounds with battery, the nV3 contains the receiver, antenna, Bluetooth, battery, a 5-pin Lemo connector on port 1, a 9-pin DB9 con-

necter on port 2, and 64-megabyte internal memory (Figure 1). The amount of memory sounds small, but it's enough to hold more than six weeks of raw observables.

The chip set inside the receiver is Pacific Crest OEM GNSS technology. It has 220 channels and is capable of receiving signals from GPS L1, L2, L2C, and L5. It also receives Glonass L1 and L2. The nV3 has reserved capability to use signals from the Galileo satellites and can currently receive Galileo test signals. The nV3 receiver is rated at a horizontal accuracy of 3mm + 1ppm RMS and a vertical accuracy of 5mm + 1ppm RMS.

The Scepter (Figure 2) is one of the lightest field devices I've seen, weighing only 9.6 ounces including the rechargeable battery. It runs Windows Mobile 6.1 on a 624 MHz processor and has 256 MB of internal flash data storage. Slots are provided in the battery compartment for a mini SD storage card and a SIM card. With a SIM card, the Scepter can be used for cell phone calls with the built-in speaker and microphone (Figure 3).

The Scepter lacks a conventional keyboard, but it has a large, 7.2-square-inch backlit touch screen. I'm a little old fashioned when it comes to keyboards and I like real keys, but this is one of the trade-offs that helps to keep the Scepter light and the cost down. The large screen makes using the virtual keyboards in Carlson and FieldGenius very comfortable.

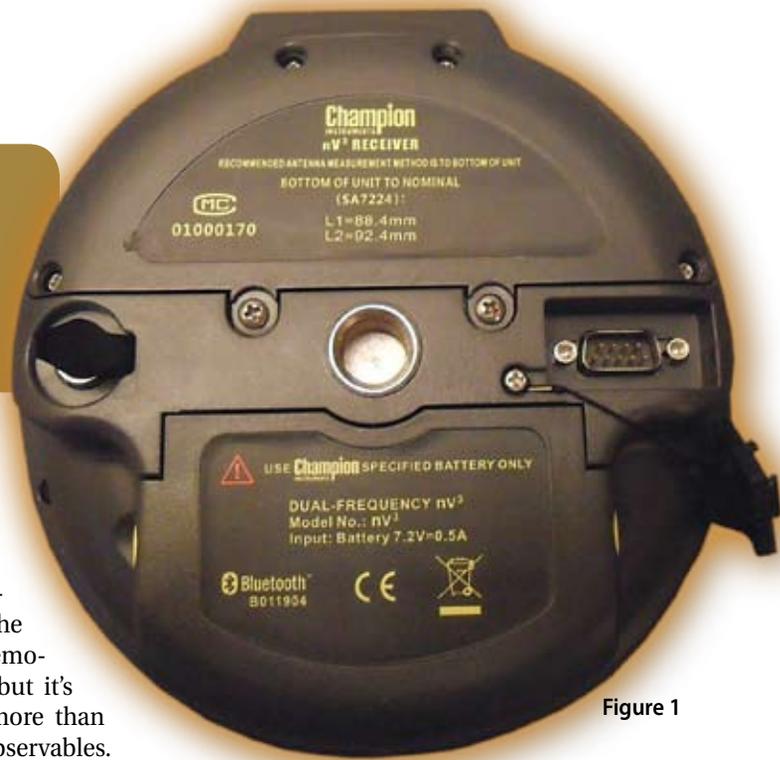


Figure 1

Connections are made via Bluetooth 2.0 and Wi-Fi. The only external port is a miniUSB. It would be nice to see a DB9 port for using non-Bluetooth equipment, but for this cable-free system, I didn't miss it. The internal Bluetooth can bond with more than one device, so if you want to add a range finder or an echo sounder, the Scepter is capable.

In addition to all of these features, the Scepter also has a built-in 3-megapixel camera and an internal 12-channel GPS receiver and antenna capable of 3- to 5-meter accuracy. This is a useful feature for GIS mapping and for recon work. The Scepter also has a port on the back for adding an external antenna. Currently, you can purchase the Scepter loaded with your choice of Carlson SurvCE or MicroSurvey FieldGenius.

The user manual and instruction materials are not as refined as you would expect from a long-established company, but I imagine Champion will develop this part of their product with time. Fortunately, the system is so easy that a 10-minute orientation from eGPS president Lonnie Sears was all I needed to be up and running. Once the system is running, everything is controlled by the software you choose.

Setting up the nV3 is a streamlined process. I turn on the nV3 and place it

on the pole, then turn on my MiFi device and place it on the pole, too. You can use a cell phone if you choose, but I chose a MiFi: a mobile hot spot that allows the Scepter to connect to the internet using its Wi-Fi connection.

When I turn on the Scepter, it receives a data stream from the MiFi device. I launch Carlson SurvCE, and it bonds with the nV3 via Bluetooth. This provides an extremely lightweight, cableless setup. In just a couple minutes I am connected to the eGPS VRS network and obtain a fixed solution (Figure 4).

The nV3 system is extremely light. The entire nV3 setup, receiver, controller, MiFi, rod, and bi-pod, weighs less than seven pounds. Simply amazing.

Naturally, the first thing I want to do is check into some geodetic monuments. While they are the standard we

on Instruments, eGPS, and also to the many surveyors over past decades who provided us with these extremely valuable control monuments!

Next, I cross the border into South Carolina, log into the SCGS VRS network, and check into a few monuments with similar results. The nV3 performs equally well on both networks.

One of the benefits I really like about the nV3 is that I am not limited to use a particular software package. I chose Carlson SurvCE because that's what I already use with my other field equipment. Whether I am collecting topo, staking, or setting control, the nV3 works well. To borrow words from another surveyor, "GPS makes surveying fun again!"

If you prefer MicroSurvey FieldGenius, you have that option. Carlson's driver for the nV3 can take several at-

by 2008 they were the largest privately owned GNSS GPS base station network in the United States. Their network covers all of Georgia and Florida and extends about five miles off each state's coastline. The experience of the owners and staff of creating and maintaining this network while providing support to its subscribers is the same experience that has gone into the creation of Champion Instruments and the design of its products.

They have done a great job with the nV3 by providing the performance of a much more expensive system at a fraction of the cost. The nV3 system with receiver, Scepter, software, pole, and bracket sells for less than \$10,000.

With any equipment purchase, you are just as concerned with product support as you are with the product itself.



work from, errors between monuments are often larger than any errors within a VRS network and our equipment's ability to provide a position.

I check into several monuments in Georgia and am amazed to be off less than 0.03' horizontally and less than 0.06' vertically. Hats off to Champi-

tempts before connecting, but I was informed that a patch is in the works to correct this and will be available by the time this review is printed.

Champion Instruments and eGPS Solutions have a very close relationship. eGPS Solutions started in 2004 with 10 base stations in the Atlanta area, and

With the nV3 I know I will receive support that is second to none. ♪

J. CRAIG BREWER, PLS is owner of Brewer Land Surveying in Savannah, Georgia. He has over 15 years of experience and is a licensed professional surveyor in Georgia and South Carolina.