

Cadastral expert improves business with low-cost GPS

Italian surveyor stakes his reputation on affordable system from Magellan

—by Robert Wick

Alessandro Prudenzi is considered by many to be one of the top cadastral experts in the Brescia region of Lombardy. He's proud of that reputation and does all he can to retain the respect of his colleagues and clients. Ultimately, that means working to the highest standards of quality and accuracy.

An architect by training, Prudenzi served in the Brescia Office of Cadastre for ten years, then, fifteen years ago, he opened his own independent office to perform appraisals and verifications of local real estate property and technical consulting to the Court of Brescia. Because land survey is just one aspect of his multi-faceted practice, Prudenzi had until recently relied solely on a total station for land survey work. He knew, though, that there's no one tool for every job; in difficult terrain, GPS would be a better solution. But GPS has been cost-prohibitive, particularly for the limited use Prudenzi expected to give it. He knew too that GPS products have been changing rapidly. GPS would make sense if he found a high-accuracy system that would amortize quickly even with limited use.

He found an ideal solution after carefully researching the available information, consulting numerous colleagues, and testing many different GPS brands and models for accuracy, ease of use, and cost. His researches led him to Magellan, one of the fast-growing GPS brands in the world, and ProMark3 RTK. The solution's low cost, high accuracy, simplicity of operation, and versatility proved superior. Prudenzi said that Giorgio Viaggi, of Guido Veronesi SRL, the Italian distributor for Magellan ProMark3, provided excellent assistance in selecting ProMark3 RTK.

Affordable accuracy

Prudenzi reports that in many tests conducted in his backyard on different days, ProMark3 RTK consistently outperformed Magellan's own published accuracy standards. For example, he says, "In static mode using a free reference network, Spidernet, with its reference stations from 90 KM to 130 KM distant, the same points showed a variation from 0.02 to



0.04 m, against a predictable and acceptable datum, which Magellan publishes, of 0.095 to 0.125 m (0.005m + 1ppm). The true values are decidedly better than those expected."

And in different RTK tests he conducted, he says, "using previously calculated points, the verifiable error is always in my experience less than 0.01 m."

Post processing: Convenience and low cost

In Prudenzi's view, a decisive advantage of ProMark3 RTK is its ability to simultaneously collect raw data during RTK sessions. "I want to underline," he says, "that Magellan has great post-processing software—GNSS solutions office software—and it's free. I know that surveyors can be frightened by the cost of post-processing software and so they do surveys only in RTK. When I'm in RTK mode, I always collect for 15 seconds on every point to gather the raw data that later allow me to easily reduce my error down to 0.001 to 0.003m. In this way, ProMark3 RTK delivers a level of accuracy which is equal to that of instruments costing more than twice as much." He adds, "It is very simple to record data in RTK mode together with raw data. The raw data are then used in the GNSS solutions software to achieve

millimeter-level accuracy—all with a low-cost L1 unit."

All-inclusive base + rover

Prudenzi particularly likes ProMark3 RTK's base-plus-rover system, which is available together with a license-free plug and play radio. While much of Lombardy has good VRS coverage, Prudenzi often works in zones with limited coverage, which is one reason he particularly likes the base-plus-rover freedom offered by ProMark3 RTK.

Prudenzi notes that many surveyors, because of the high cost of GPS systems and to hold costs down, will purchase only a rover and use differential corrections broadcast from nets in their area. The problem is that in too many areas, differential corrections are not available and even when they are, the virtual reference station can sometimes be some distance away. A virtual station 4 km away, he points out, will have an error of almost 4 mm. But with ProMark3 RTK, distance is not an issue because the instrument includes a base station and rover, at a cost equivalent to another brand's rover only. "When I collect in RTK using the base station and simultaneously collect raw data, I can achieve a precision up to ten times better than with the rover only and differential corrections."

Business performance

Prudenzi always uses the ProMark3 RTK in difficult physical conditions where a job that would take two days with a total station takes but a couple of hours with the ProMark3 RTK. Importantly, the relatively low cost of ProMark3 RTK means that even in Prudenzi's limited field survey work, the cost is quickly amortized.

Italian cadastral law requires the use of three reference points to locate a house. Therefore, a house might require a minimum of more than a dozen points to be measured. And those points all need to be right on. Even though the ProMark3 RTK is half the cost of competitive brands offering similar results, its accuracy is so impressive that Prudenzi now uses the unit for almost half his land survey jobs.