

Cost-Effective GNSS

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SUMMARY

The first commercial GPS receivers were on the market in 1982. The receivers were large and bulky and could only track four satellites simultaneously. The satellites to track had to be selected manually on the receiver. Moreover, national geodetic agencies, research institutions and universities spent up to 250,000 € for a single receiver. Today, modern receivers are much more sophisticated and can track GPS and Glonass satellites simultaneously on more than 50 channels. Some of the latest receiver models can also track Galileo signals. Everything from satellite tracking to coordinate determination is computed automatically in real time. At the same time costs of new receivers continue to decrease. A high-end geodetic quality GNSS receiver costs around 20,000 €. If one is restricted to single-frequency, geodetic quality receivers, one would still have to spend 5,000 € to 12,000 €. In general this is not a problem in developed countries, but it may be a drawback in developing countries or for tasks where the surveyor needs a lot of receivers for specialized tasks such as monitoring.

In this presentation based on a FIG report the authors will present several topics regarding cost-effective use of GNSS. There are two possibilities to economize money. The first pertains to a reference site or a network of reference stations and the second primarily concentrates on the rover or users side. For the first, they focus on Continuously Operating References Station (CORS) networks that provide the reference site(s) data and metadata to the users. For the second, the report proposes to use low-priced (below 150 €) GNSS receivers instead of high-quality geodetic receivers to economize money. Finally the effect on the working costs is roughly estimated and the benefit for the users is presented.

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