

Using SmartStation and GPS Integrated With INS, to Map Underground Pipes and Cables

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Abstract

The Institute of Engineering Surveying and Space Geodesy (IESSG), in collaboration with five other universities and industrial partners in the UK, is involved in two major projects concerned with locating and positioning buried assets in a non-invasive manner. GNSS based technology can be used to map these assets, however, most of the environments are built up areas where GNSS signals are lost, unavailable or have large errors. The aim of the projects is to tackle the issue of positioning in built up areas in two stages. The first stage is to integrate GPS with other sensors such as INS and a total station. The second stage is to analyse using simulation, the impact that future GNSS developments will have when there are three fully operational satellite navigation systems, i.e. GPS, Galileo and GLONASS. This paper gives an overview of these projects, illustrating the research being developed in each of the above areas. Preliminary results using a Leica SmartStation and GPS integrated with INS are presented with analysis and discussion of the results.