

European GNSS for Surveying and Mapping

Reinhard Blasi and Alina Hriscu (Czech Republic)

Key words: Cadastre; Cartography; Digital cadastre; Engineering survey; Geoinformation/GI; GNSS/GPS; Land management; Low cost technology; Marine cadastre; Mine surveying; Positioning; Professional practice; Quantity surveying; Reference systems; Spatial planning; Urban renewal; Young surveyor

SUMMARY

European GNSS for Surveying and Mapping

The European GNSS Agency, or GSA, manages Europe's GNSS programmes. Through European Geostationary Navigation Overlay Service (EGNOS) and Galileo, the GSA is connecting the benefits of space technology to European citizens from all walks of life. From aviation to mapping, maritime to rail, European satellite navigation is changing the way we live and do business.

Already today EGNOS is growing the use of GNSS in real time basic mapping solutions by providing free accuracy that is widely available. Applications where meter accuracy is adequate can benefit from EGNOS such as GIS and thematic mapping for small and medium municipalities, forestry and park management as well as surveying of utility infrastructures (e.g. electrical power lines). Most of GNSS receivers used for mapping are now EGNOS ready and the EGNOS signal is free of charge. Besides the professional users, EGNOS also allows more and more non-professionals to access GNSS mapping technologies, thanks to the affordable and simple solutions. The EGNOS signal provides a constant level of position accuracy throughout the EGNOS compliance area which covers Europe and currently extending the coverage to Africa and Middle-East. The EGNOS corrections can be received via different means: directly via EGNOS satellites, with a normal GNSS-receiver that is EGNOS-enabled, without any communication cost or via terrestrial communication means such as internet or cellular networks, thanks to EDAS, the EGNOS Data Access Service.

Getting ready for Galileo to fully take off, the surveying community may benefit from multi-constellations starting by the imminent Initial Services Declaration. Surveyors will benefit from easier mitigation of multi-path errors, better availability, continuity, reliability and improved

geometry, and better results in harsh environment such as urban canyons and under tree canopy. Along the Galileo Open Signal with single or dual frequency (E1, E5) Galileo will offer Commercial Service (CS) dedicated for high precision applications. CS High Accuracy (CS-HA) will deliver corrections via Galileo E6 across the globe (PPP - precise point positioning) for high accuracy applications across all segments and in quality as comparable RTK. Moreover, CS-HA will offer triple frequency with faster convergence time for surveying applications and with achievable accuracy comparable to RTK. Users can also benefit from authentication service which will be the first-ever Signal in Space based method to assure that the positioning is based on utilising Galileo-signals and data from actual satellites and not from any other source (spoofing detection).