1 OBJECTIVES

The objective of AUDITOR is first, to develop an improved GNSS ground-based augmentation system and second, to deliver services in precision agriculture based on the new augmentation system. The GNSS augmentation system will implement novel precise positioning techniques with modern and proven algorithms in highly configurable, cost-effective receivers. These new receivers will enable cost-effective precision agriculture services to farmers, especially those with small and medium-sized businesses in areas of Europe where EGNOS coverage is poor.

The first objective of the AUDITOR project is the upgrade of existing GNSS augmentation networks by implementing and demonstrating new techniques in a proof-of-concept prototype network comprising the reference stations, network software and user receiver module applying the corresponding data corrections. Receivers will support dual-frequency Galileo and provide direct access to low level measurements to allow more advanced analysis of the GNSS signals, from signal integrity monitoring and authentication to improved monitoring and mitigation of ionospheric irregularities, a key aspect for boosting precise positioning beyond the state of the art.

The second objective of AUDITOR is to use the improved GNSS augmentation network to deliver cost-effective services in precision agriculture. AUDITOR specifically targets farmers in areas of Europe where EGNOS coverage is insufficient (associated to the coincidence of poorer network edge coverage and higher ionospheric gradients: Greece, the Spanish Canary Islands, parts of France and South of Spain, among others), and within these areas, those farmers with small or medium-sized farms for whom the cost of a private RTK solution is prohibitive.

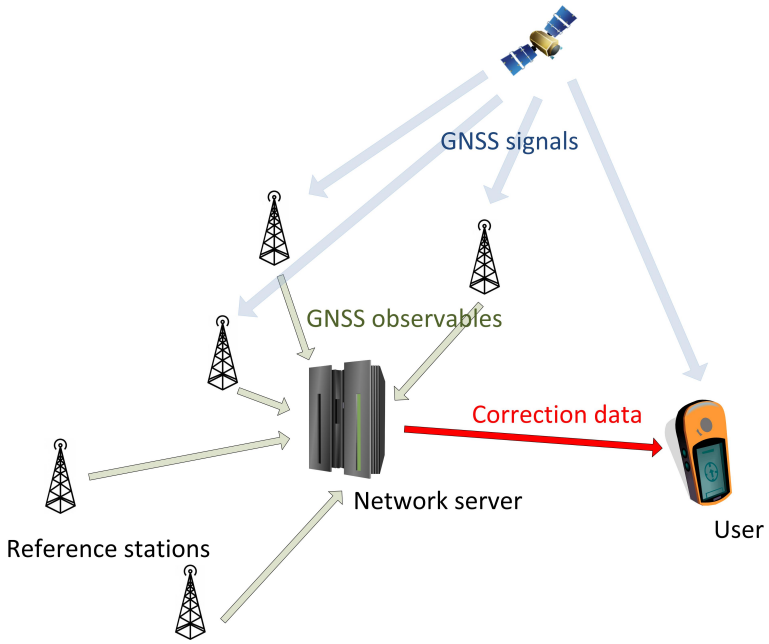

Figure 1. Structure of a ground-based augmentation network

AUDITOR will deliver the following:

- GNSS network software that enables enhanced features, including advanced precise positioning with high accuracy and fast fix
- Flexible dual-frequency GNSS receiver platform
    - Hardware/software hybrid
        - SDR-based low-power embedded receiver
        - Fully reconfigurable
        - Test-bed for advanced signal processing algorithms
        - Low-level access to data to enable new functionality
            - Interference detection and reporting protocol for reference monitoring
            - Anti-spoofing protocol for centralized authentication
            - Scintillation monitoring and analysis
    - Galileo/EGNOS enabled
    - Reconfigurable front-ends for alternative double band operation (L1/E1 and selectable L2 or E5)
    - Commercial off-the-self approach for hardware components enabling short time-to-market through a faster implementation process
- Implementation of GNSS augmentation methods based on open software
    - Observable generation based on GNSS-SDR [1]
    - Data exchange based on RTKlib [2]

References

[1] GNSS-SDR: Global Navigation Satellite System Software Defined Receiver. http://gnss-sdr.org/project

[2] RTKLIB: An Open Source Program Package for GNSS Positioning. http://www.rtklib.com/