

# GNSS RAW DATA LOGGING APPLICATION USING OPEN SOURCE POSITIONING ENGINE GOGPS

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## ABSTRACT

*goGPS is a free and open source positioning software package that processes single-frequency observations in either absolute or relative mode. It can use both code and phase observations by geodetic or low-cost receivers. goGPS can compute single-epoch solutions by weighted least squares adjustment, or applying a Kalman filter on either positions or observations, also by exploiting a dynamic model [1]. Moreover, goGPS supports EGNOS ionospheric, pseudorange and satellite position/clock corrections (also by exploiting the EGNOS Message Server - EMS) for absolute positioning, the resolution of integer ambiguities by LAMBDA method in single-frequency relative positioning, and multi-constellation support including GLONASS, Galileo, BeiDou and QZSS [2]. There are two versions of goGPS, which are the MATLAB and Java versions. goGPS was originally written in MATLAB and, generally, new functions and enhancements have been implemented and tested in the MATLAB version first. goGPS Java development was started in order to allow a wider user base to develop and use it, as well as to provide higher processing speed [3]. In this presentation, we show an application using goGPS Java for a low-cost GNSS raw data logger. The features are explained below:*

- support u-blox low cost receiver.*
- multiple receivers logging (from COM ports).*
- both raw data (UBX binary protocol) and NMEA logging.*
- on-the-fly UBX decoding and RINEX file writing.*
- GPS time and system (PC) time synchronization.*

*To give an application example, this logger was developed within a project involving the precise positioning and attitude determination by means of three u-blox receivers of an autogyro (an aircraft similar to a small helicopter), which was carrying several remote sensing instruments (among which a natural radiation sensor and cameras for aerial photogrammetry) which required precise time synchronization.*

*In addition, This presentation explains recent developments and activities of goGPS projects.*