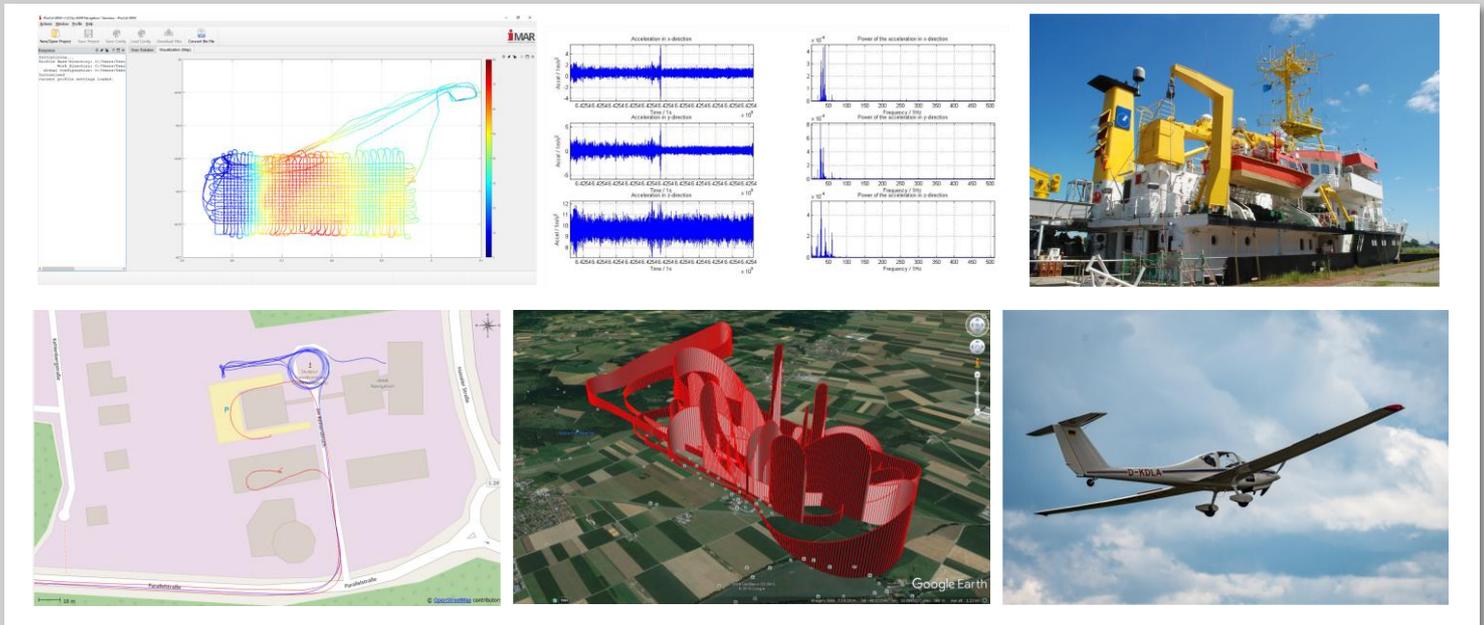# iPosCAL

INS/GNSS Post-Processing & Calculation Software
for iXCOM-based Inertial Measurement Units

Determination of Position, Velocity, Attitude and Gravity Disturbance - *with a single click!*

iPosCAL is iMAR's powerful and easy-to-use INS/GNSS/ODO post-processing software, fully compatible with all iMAR INS/GNSS devices supporting the iXCOM communication protocol, like iNAT, iCORUS, iTraceRT-MVT, iRail, iATTHEMO, iPST etc. The software allows the processing of a single data set as well as the fully automated **ultra-fast batch-evaluation** of a larger survey campaign, with up to hundreds of flights / tracks. **iPosCAL** is available in several editions:

iPosCAL-SURV, designed for IMS-based **surv**eying, allowing the precise determination of position, velocity and attitude over time, along with the respective standard deviations. The software is designed for the full range of INS/GNSS applications: From low-cost MEMS up to highest performance with optical or hemispherical gyroscopes, thereby covering any industrial, automotive, railway, airborne, marine, surveying, defense and research applications. [P/N 00028-00036-xxxx]

iPosCAL-GRAV is designed for airborne or shipborne **grav**imetry campaigns, in combination with iMAR's family of strapdown gravimeters iCORUS. *On top* of all the features of iPosCAL-SURV, it offers additional functionality for airborne or shipborne gravimetry: The automated determination of survey line endings, an automated generation of cross-over statistics as well as basic cross-over network adjustment methods, the generation of gravity map images, and more. [P/N 00028-00032-xxxx]

iPosCAL-PST is designed for pipeline surveying using iMAR's iIPST **p**ipeline **s**urveying **t**ools. *On top* of all the features of iPosCAL-SURV, it offers additional functionality for specific pipeline related marker aiding procedures, specific odometer processing etc. [P/N 00028-00034-xxxx]

CAPABILITIES & FEATURES

All editions of **iPosCAL** offer an easy-to-use simple processing mode for the less experienced user, as well as an expert mode, allowing the fine-tuning of all relevant processing parameters, GNSS-arrays with multiple antennas, user-customizable output files, and much more.

- Position, velocity, attitude and standard deviation determination with exceptional performance
- ultra fast processing speed and very high accuracy (~**5 seconds processing time per 1 hour measurement data**)
- Determination of gravity *(version iPosCAL-GRAV)*
- Automated, batch-processing to handle even very large campaigns (command line interface availabe)
- Signal Processing: multi constellaion / multi frequency GNSS, Filter and spectrum analyzer capability, lever arm estimator, multi-turn calculation etc.

The high performance, ultra fast and easy-to-use Post-Proc Solution
for both, Field Operators and Experts

iPosCAL

iMAR NAVIGATION & CONTROL

Technical Data iPosCAL-SURV / -GRAV / -PST

Input Data and Formats:

Post-Processing:
- iXCOM PostProcLog (any iMAR INS/GNSS system with iNAT architecture), or
- NovAtel SPAN Rawata format

Gravimetry:
- iXCOM GravLog (iCORUS product family);
- optional: terrestrial gravity tie value at port/airport to obtain absolute gravity estimates

GNSS Aiding:
- Waypoint GrafNav ASCII files, or
- Binary files from GNSS eng. of type MOSAIC (Septentrio) or OEM77xx (NovAtel), or
- RINEX 3.x (raw GNSS observations)

Odometry Aiding:
- iXCOM OdoLog (included in PostProcLog) [for land based aplications]

Output Data (excerpt):

- ✓ Position (latitude / longitude / ellipsoidal height) & Time
- ✓ Velocity (North-East-Down or body-fixed Front-Starboard-Down)
- ✓ Attitude: Roll/Pitch/Heading or as full 3x3 rotation matrix
- ✓ Gravity or gravity disturbance *(requires iPosCAL-GRAV)*
- ✓ Estimates of accelerometer and gyroscope biases
- ✓ Estimated standard deviations of position / velocity / attitude / gravity
- ✓ Quick-Look even without RTK corrections possible in the field

Output Formats:

ASCII / .csv (customizable)

binary files (MATLAB scripts available)

.kml (for integration with GoogleEarth)

NetCDF data files (for the integration with GMT; *only iPosCAL-GRAV)*
customized formats

Example (GUI / HMI):

iCORUS-02 Srapdown Gravimeter
(INS/GNSS for data acquisition)