National report of Estonia

Karin Kollo, Andres Rüdja, Jaanus Metsar, Artu Ellmann
Estonian Land Board

NKG General Assembly, 5-8 September, Copenhagen, Denmark
• ESTPOS management
  • Equipment
  • Two receivers with signal interference detection option
  • Antenna spike
  • Users and services
• GNSS computations for NKG-AC in time, scripts semi-automatic
• ESTPOS vision by Kollo, Rüdja, Metsar, Ellmann 2021
• EPN and EPOS site TOR200EST was decommissioned on 31.08. New site, ca 40 m south from old site position, is almost ready.
Signal interference investigations

• Two Leica GR50 receivers with Interference Detection option and Interference Toolbox support.

• With the Interference Toolbox it is possible to monitor and analyse interference in real-time. It is also possible to record data for later analysis.

• The Interference Detection option notifies about any detected interference via event email, event email gives information about the time, frequency and power of detected interference.
Remeasurement of national geodetic network

- AIM: quality assessment, transformations, CORS integration
- 2020, 2021 (GeoRefAct), 2022
- Static GNSS
- 6h sessions
- 7 campaigns performed
Estonian-Latvian cooperation

- Interreg V-A Estonian-Latvian programme
- Project „Harmonization of Estonian and Latvian geodetic systems in border areas“ (GeoRefAct)
- Project period 2021-2022
- Estonian Land Board and Latvian Geospatial Information Agency
- Activities:

  Measurements and computations of national GNSS and levelling networks in border area, local network of twin-city Valga/Valka and gravity survey in Northern Latvia

  Results: coordinate and height transformation models including web-based services
GeoRefAct 2021

Directors-General in Valga/Valka

+ 4 levelling lines

Valga/Valka GNSS + traverse + levelling

Legend:
- Estonian ground point
- Estonian ground point with no levelling
- Estonian base station
- LVPR base station
- Baselines between ground benchmarks
- Baselines to COVE

New connection lines between Estonian and Latvian levelling networks
- Latvian levelling lines
- Estonian levelling lines
- Latvian-Estonian border
Geodetic metrology

• Meteo instruments:
  • the devices are hardware and software assembled
  • The data processing software is updated
  • Measurement forms prepared
• Calibration measurements of LGIA equipment 01.11 - 04.11.2021, ELB equipment May 2022
• Initial consultation with the Ministry of Justice on legal analysis
• The requirements for a certified metrology laboratory have been reviewed
• Consultations with AS Metrosert regarding the Maa-amet as a legal metrology laboratory began
• Consultations in FGI (Nov 2021)
Geodetic Point Database

• 35 000 geodetic points in the geodetic points database
  • 45% from national networks, 55% from local networks
• Local authorities are obliged to take decisions on local geodetic infrastructure
• Legislative changes are planned
• Discussion about the rearrangement of geodetic points database
• New web interface for geodetic point database from July 2022
Other activities

- Outsourced high-precision levelling
  - 2020: 12 km (near harbours of West-Estonian islands)
  - 2021: 33 km (Kilingi-Nõmme, Meemaste, Navi)
- Revision of geodetic legislation in Estonia
  - Needs to be updated
- Maintenance of geodetic marks
  - Previously outsourced,
  - starting from 2021, ELB performs itself
- Coordination of plans and construction projects in terms of geodetic marks
- Coordination of projects and reports of geodetic works
- Updates of geodetic instruments
  - digital level Trimble DiNi, total station Leica TS60, 3 meteosensors with field computers, fieldbook for measurements, one upgraded and one new GNSS permanent station receiver Leica GR50
Moving Toward the Digital Twin

- 3D Estonia, country-level coverage
- Fully automated processing

31 March 2021  https://3d.maaamet.ee/kaart/

Vision: Reality and augmented reality application: 3D buildings, building information, route information