

LATVIJAS ĢEOTELPISKĀS
INFORMĀCIJAS AĢENTŪRA

Latvian geodetic network and GNSS applications in Latvia

J.Zvirgzds

Presentation outline

- Geodetic Network
- LatPos system
- RTK applications



Division of Geodesy

- Arrange and maintain the National Geodetic Network:
 - horizontal (GP) network
 - levelling (vertical) network
 - gravimetric network
 - geomagnetic network
 - Global Positioning base station network - LatPos
- Survey the state border
- Expertise to geodetic work results
- Maintain geodetic data in National Geodetic Network Database



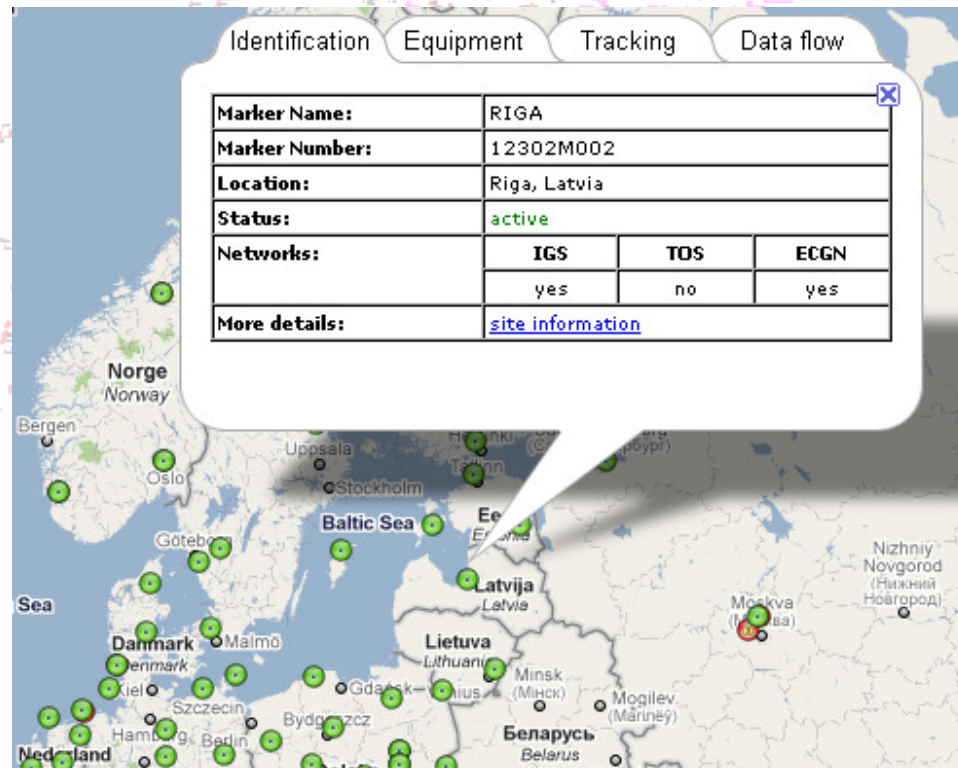
Horizontal geodetic network

National horizontal network is a Latvian Coordinate System LKS-92 realisation on field.

Geodetic point Riga is a zero point for national coordinate system.

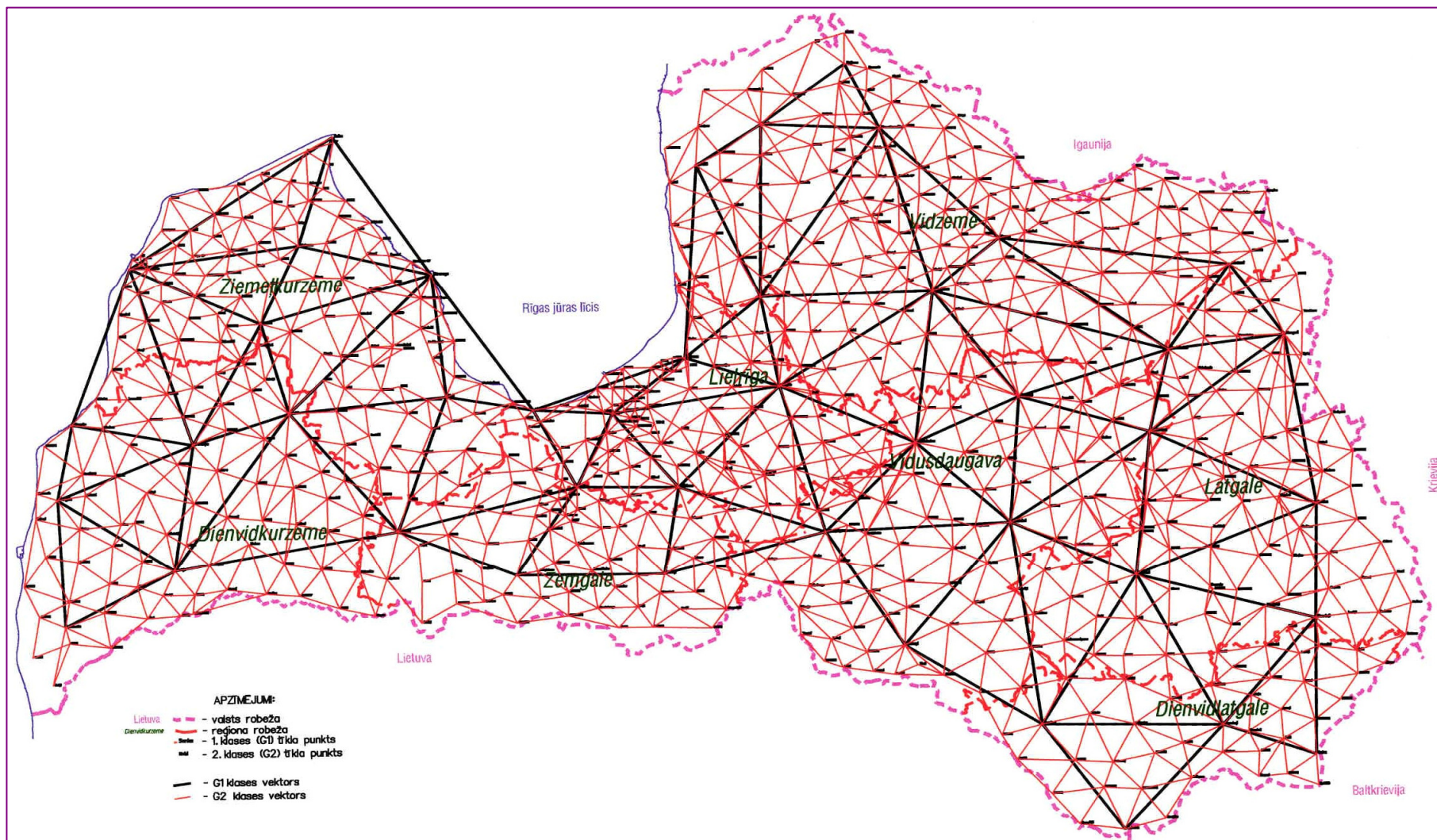
This point also is a:

- EUREF permanent reference station;
- International GNSS service (IGS) permanent GPS & GLONASS station.



There are 4 precision classes of national geodetic horizontal network – 0., 1st., 2nd. and 3rd. (total amount of points 9000)

Horizontal geodetic network



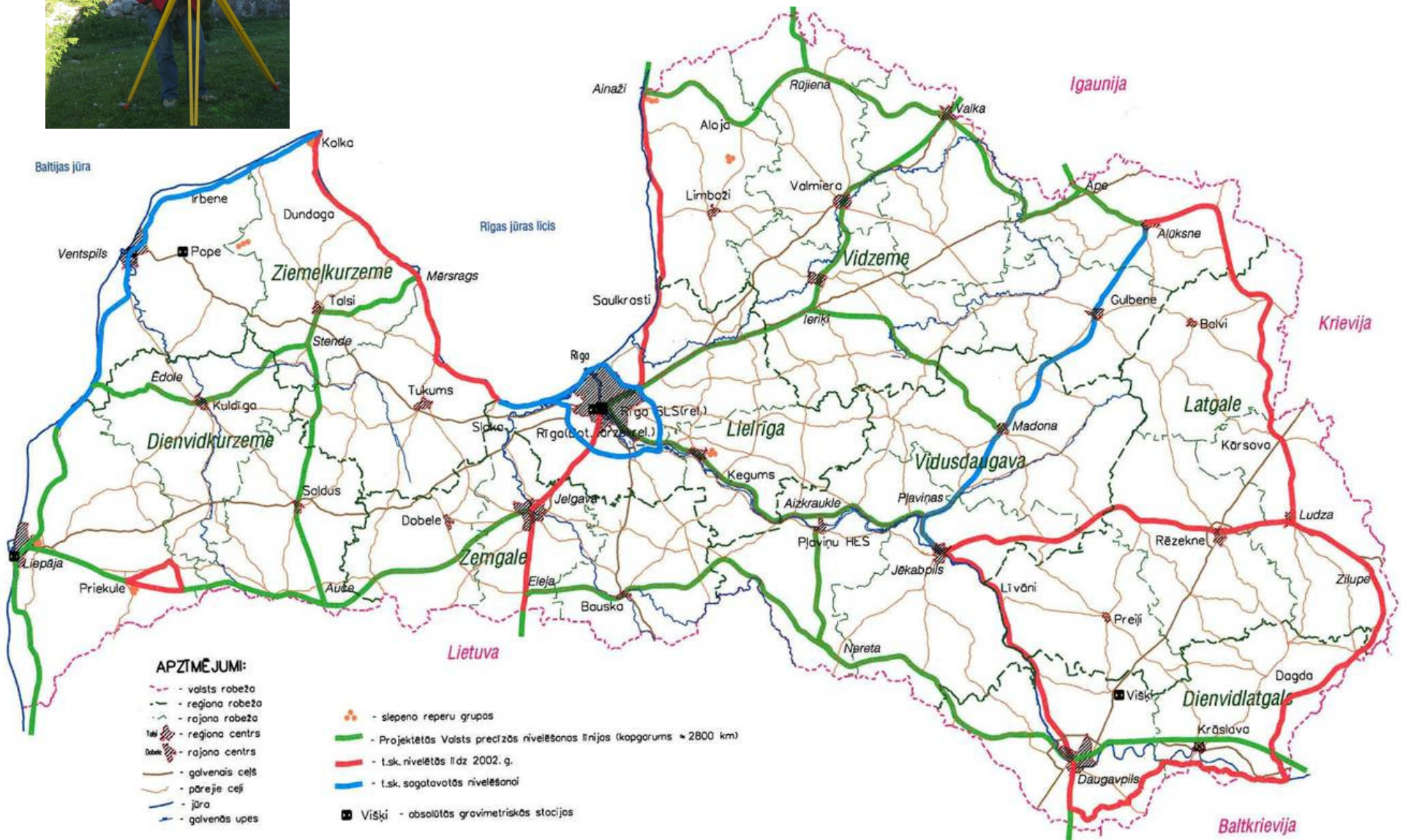
1 st and 2nd class network

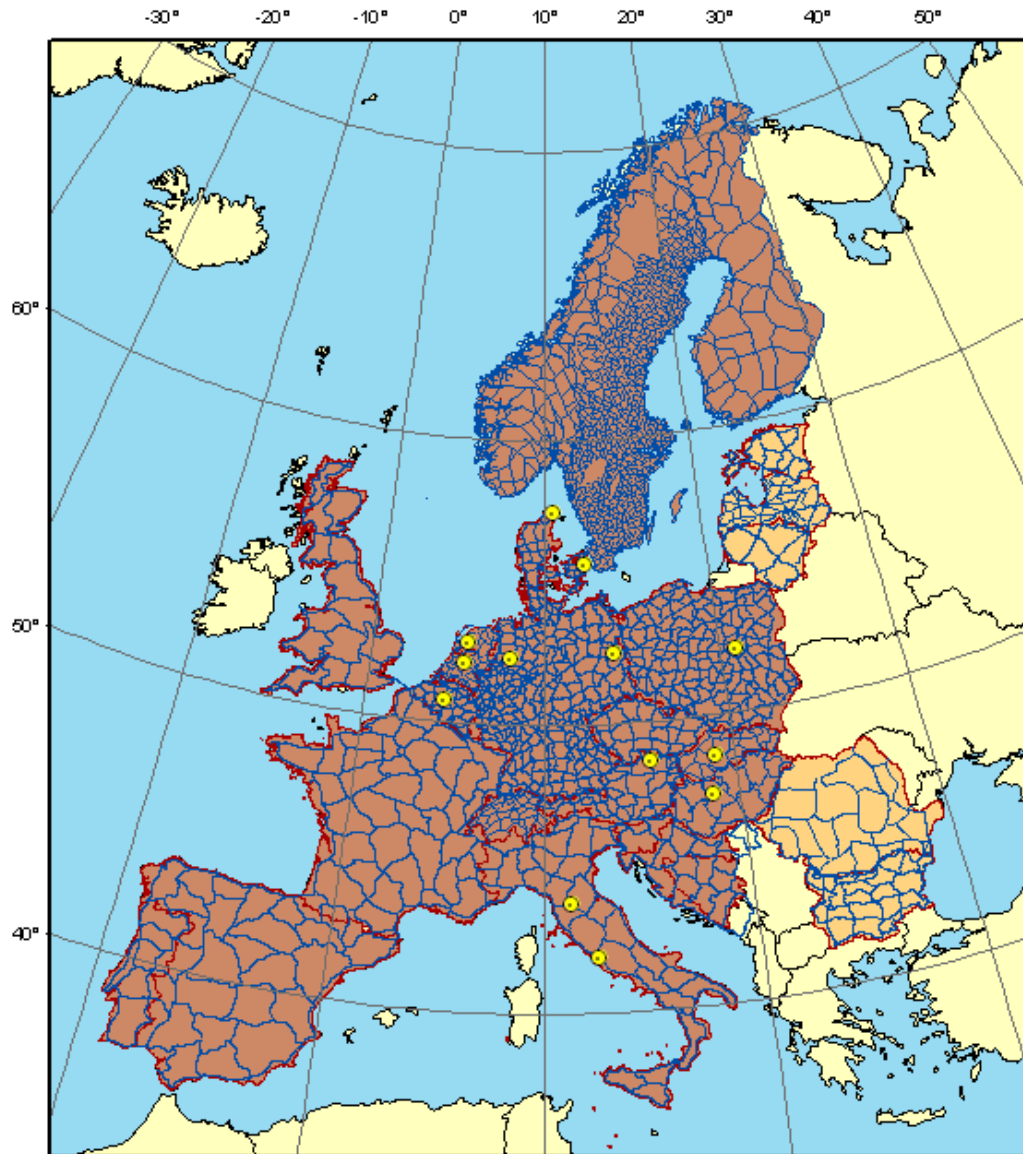
Leveling network

- Baltic Height system 1977 is used in Latvia
- Levelling network consist of 10 loops and we have 3 connections with Estonian leveling network and 3 connections with Lithuanian leveling network.



Levelling network





Extension of UELN

■ up to 1998

■ as from 2003

● Datum points of EVRF2007

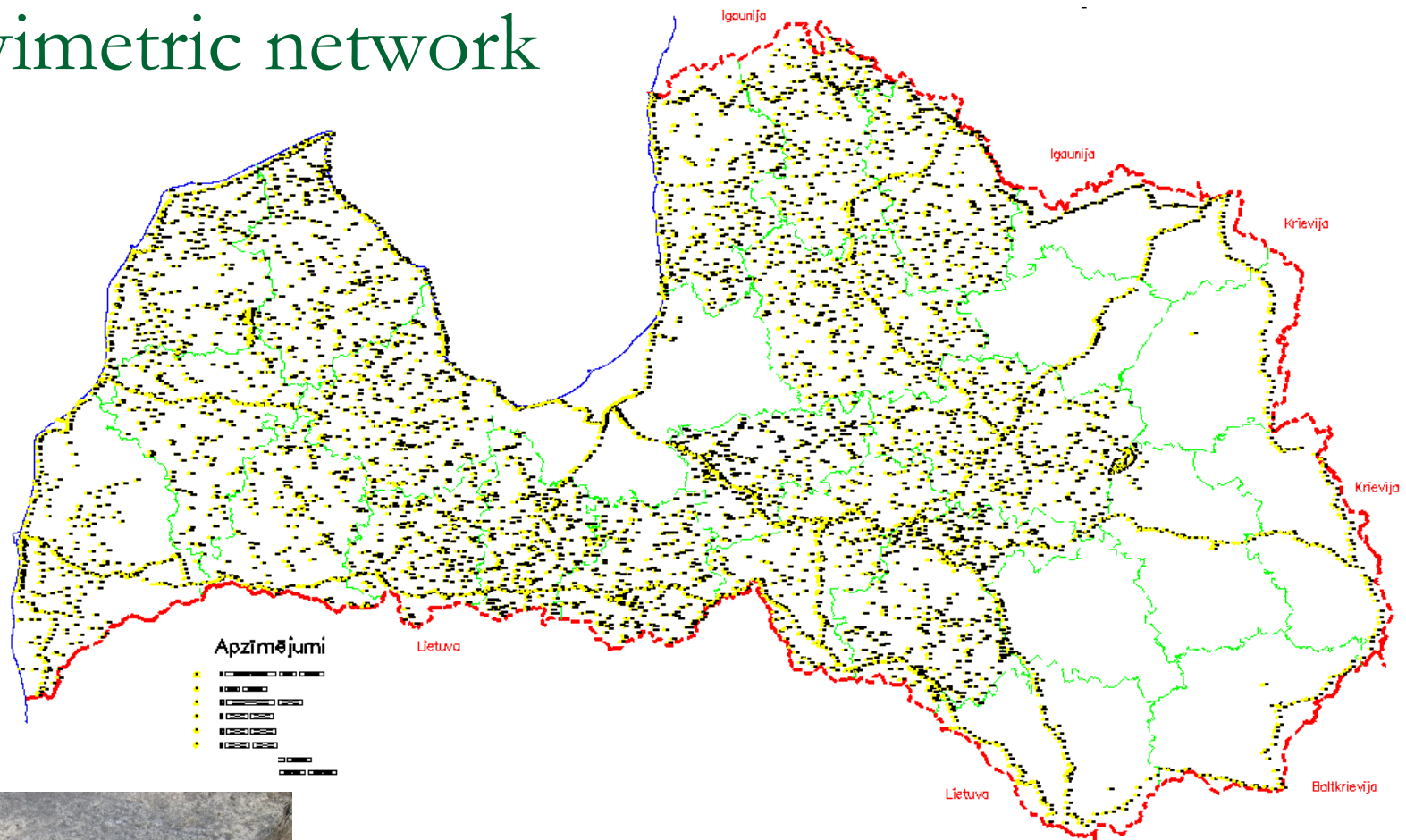
— UELN lines

The European

Vertical Reference Frame 2007 (EVRF2007)



Gravimetric network



First order gravimetric network consist of 3 absolute points which are base for all gravimetric network in Latvia and these points are part of The International Gravity Standardization Net 1971 (IGSN71)

Geomagnetic network



- geomagnetic measurements started in Latvia in 2004.
- There are established 6 repeat stations.
- every year Measurements have been sent to the World Data Centre for Magnetism and data are used for World Magnetic model computations

National geodetic network database (NGNDB)

Valsts Ģeodēziskā tīkla datubāze - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://db.lgja.gov.lv:8882/start.php

Valsts Ģeodēziskā tīkla datubāze

Sistēma

- Statistika
- Adrešes
- Zīmes noformējums
- Zīmes tips
- Tīkla veids
- Par programmu
- Lietotāja instrukcija

Atlase

Atlases parametri

Meklēt Attīrīt

Punkta nosaukums: Aizpurīši

Punkta klase:

Markas numurs:

Adrese

Rajons:

Novads/Pagasts:

Pagasts:

Koordinātas

X (LKS-92):

Y (LKS-02):


B (Ģeogrāfiskās):

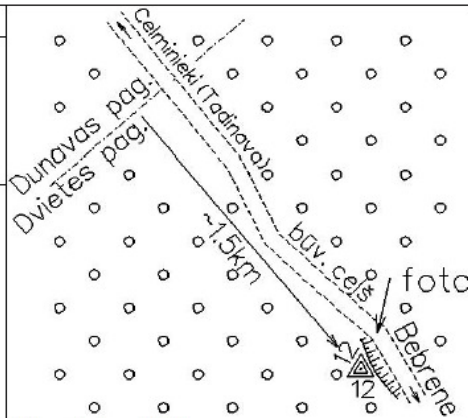
L (Ģeogrāfiskās):

Meklēšanas instrukcija

1. solis. Ievadiet meklēšanas kritērijus
2. solis. Nospiediet pogu meklēt

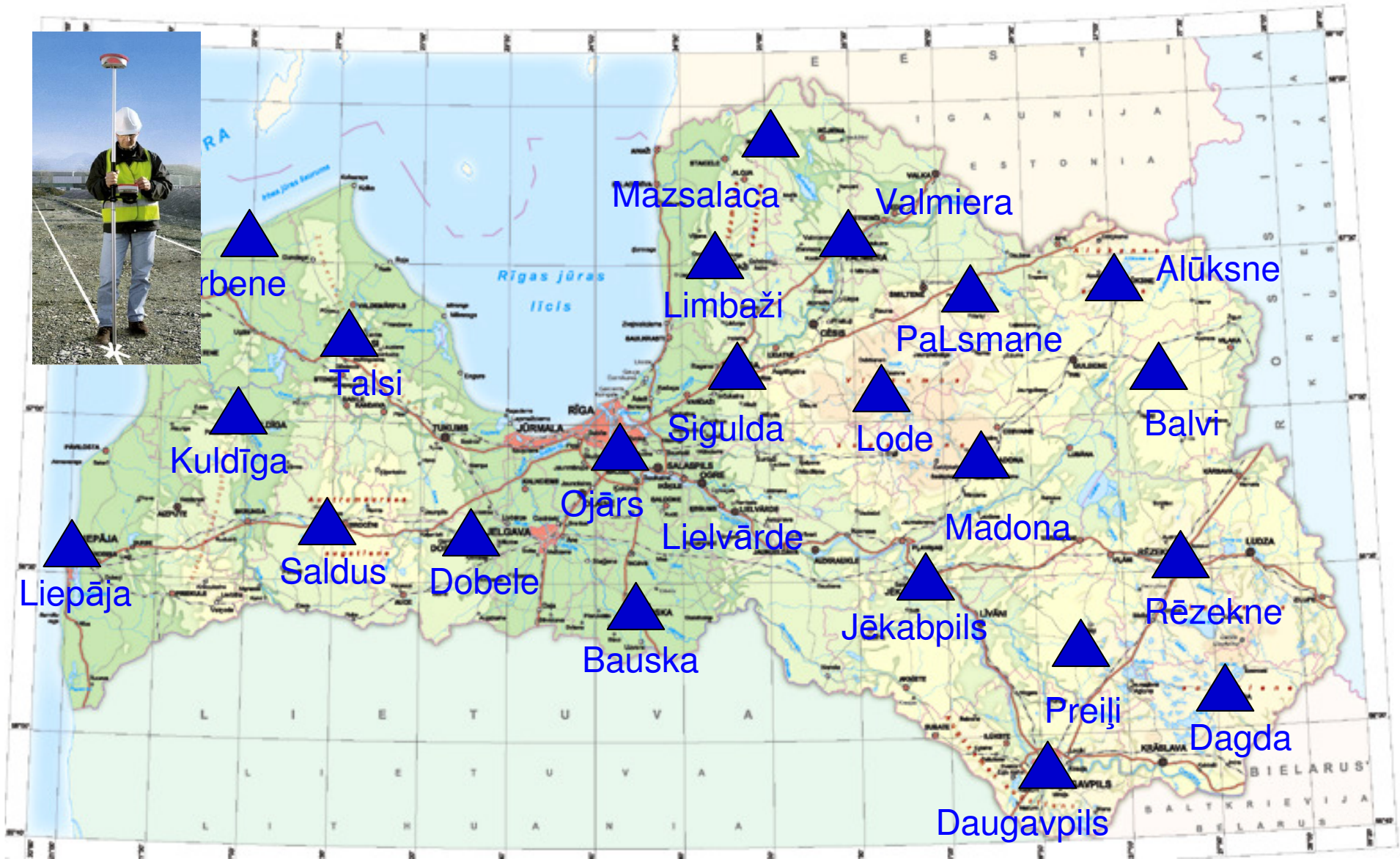
Lai atceltu ievadītos meklēšanas kritērijus, nospied



| <p>Valsts Ģeodēziskā tīkla punkts</p> <p>Nosaukums: Aizpurīši</p> <p>Citi nosaukumi:</p> <p>Adrese: Daugavpils rajons Dvietes pagasts</p> <p>Balkolas, mežā, Dvietes pagasta ZR daļā.</p> | |  <p>Abrisa sagatavošanas gads: 2008</p> | | | | | | | | | | | |
|--|---|--|-----|----------------|--------------|---|------------|-----|---|------------|-----|--|---|
| <p>Ģeodēziskā zīme</p> <p>Zīmes noformējums: Markas Nr.: 57971</p> <p>Uzraksti uz markas:</p> <p>Apskošanas gads: 2008</p> <p>Orientierpunkti:</p> <table border="1"> <thead> <tr> <th>Nr.</th> <th>Direkc. leņķis</th> <th>Attālums (m)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>005°40'59"</td> <td>260</td> </tr> <tr> <td>2</td> <td>157°43'10"</td> <td>309</td> </tr> </tbody> </table> <p>Noformējums: AP - apvācns priekšmets; AV - sīksargvāks; K - sprausms (kupīca); N - norādītājstabiņš; P - piramīda; PS - pežišanas stabs; S - signāls; SS - signālstabs</p> <p>Klase: T1</p> <table border="1"> <tr> <td>Koordinātas: LKS92 TM x=223084.102 y=635099.607 m=0.99982386</td> <td>Augstums: 1977 g. Baltijas H=108+ (+ ģeom. nīv.) (- trig. nīv.)</td> </tr> </table> <p>GPS mērījumi veikti: Nivelēšana veikta:</p> | | | Nr. | Direkc. leņķis | Attālums (m) | 1 | 005°40'59" | 260 | 2 | 157°43'10" | 309 | Koordinātas: LKS92 TM x=223084.102 y=635099.607 m=0.99982386 | Augstums: 1977 g. Baltijas H=108+ (+ ģeom. nīv.) (- trig. nīv.) |
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| <p>Piezīmes:</p> <p>Apskošanai</p> | | | | | | | | | | | | | |

Krokas izstrādāts no Valsts ģeodēziskā tīkla datu bāzes: 2009.02.19

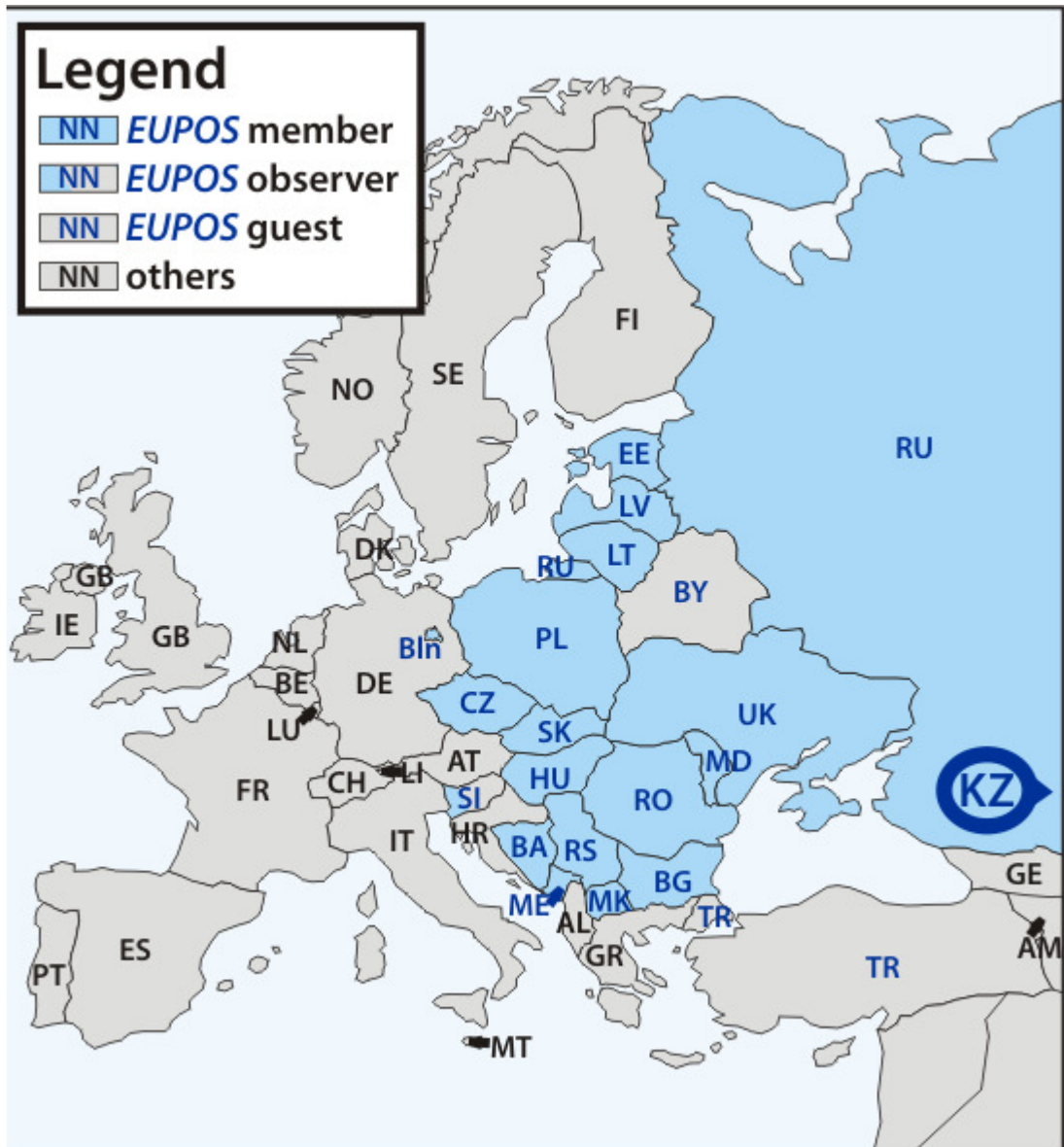
Permanent reference station network in Latvia (LatPos)



LatPos system

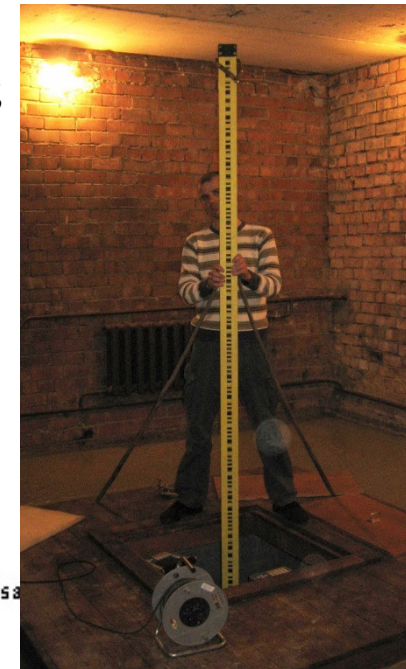
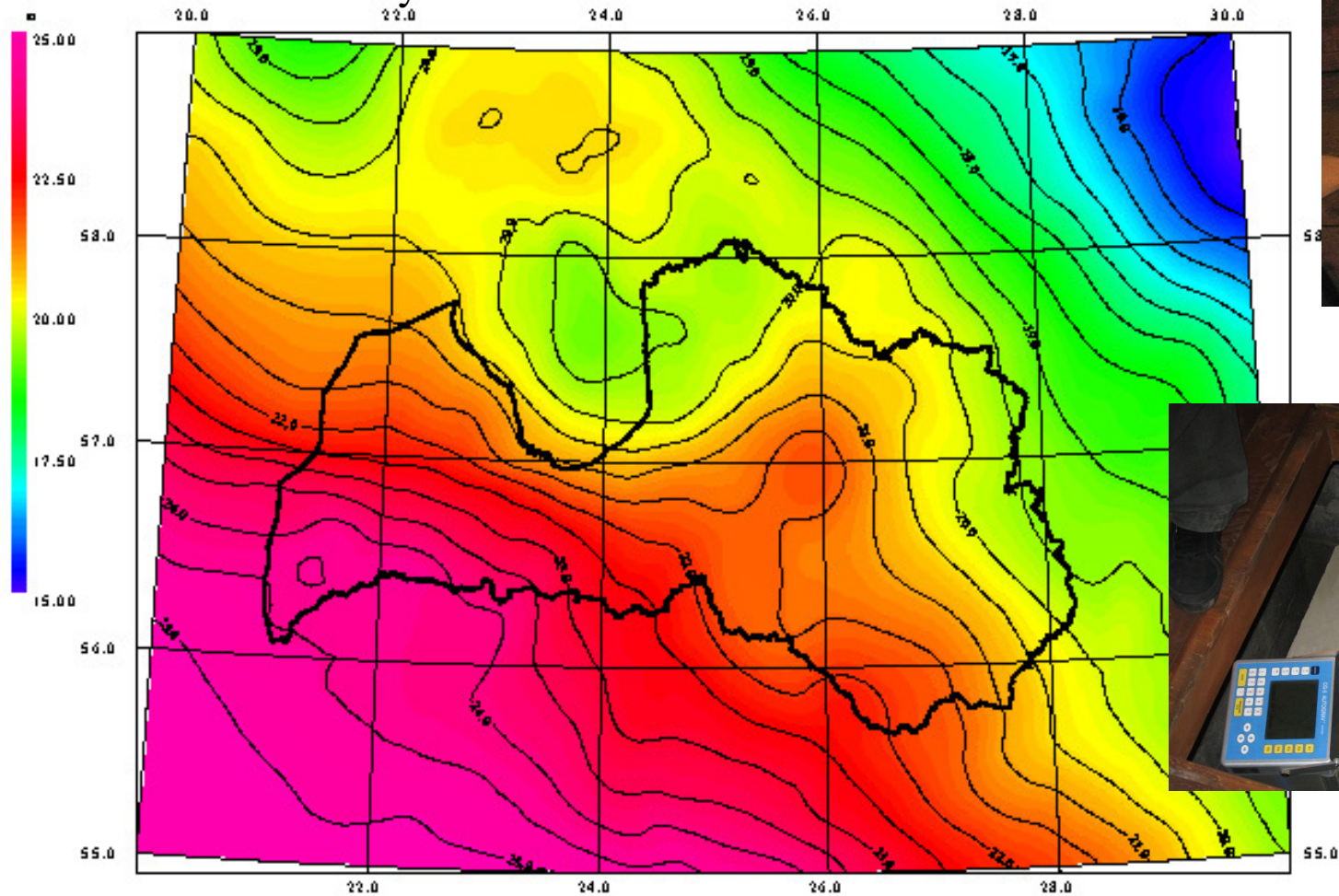
- Installed Year 2005., 19 stations, GPS system
- Years 2010 – 2011 added 4 new stations. Total 23 stations
- Improved to receive – NAVSTAR, GLONASS, GALILEO, Kompass.
- Provide standard RTK correction format RTCM 3.1
- Nearest station
- Network solutions MAX, iMAX

LatPos as a part of EUPOS



Gravimetric geoid for Latvia LV'98

- model area from 55.0° to 58.5° N.lat. from 20.0° to 29.0° E.long.;
- digitize data from maps in scale 1:200 000 (Сецгеофизика);
- altimetry data from ERS-1;
- 32 GNSS/levelling observation;
- model accuracy 8 cm.





DOBELE



Base station

Internal memory up to 7 days of data

UPS keep up running for 2 days

Antena



UPS
Uninterrupted
Power Supply



Metal box

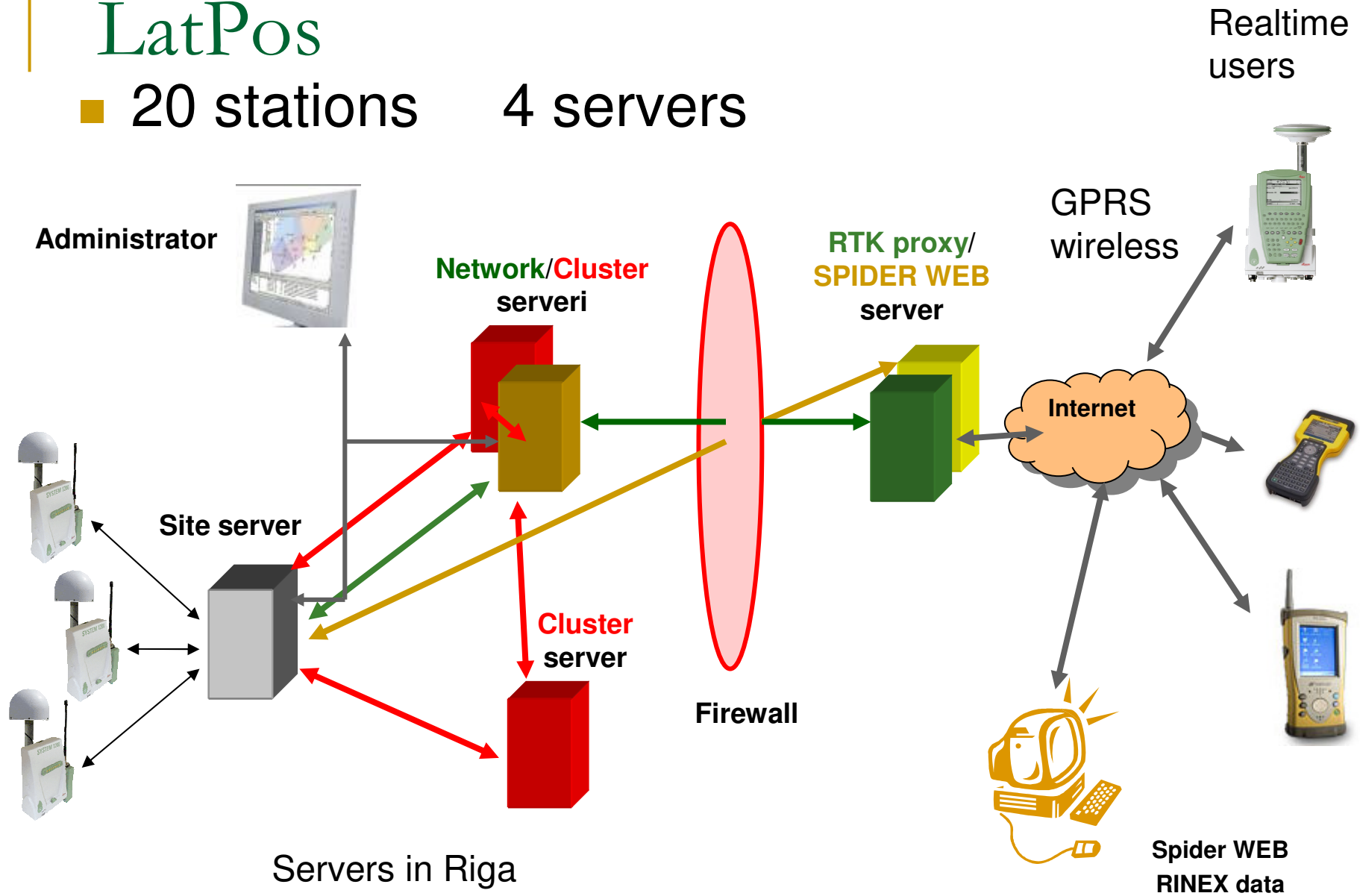


GPS Receiver
GRX1200 Pro



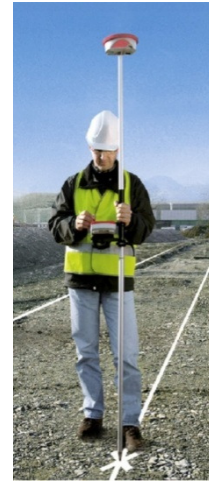
LatPos

- 20 stations 4 servers



LatPos services

- RTK



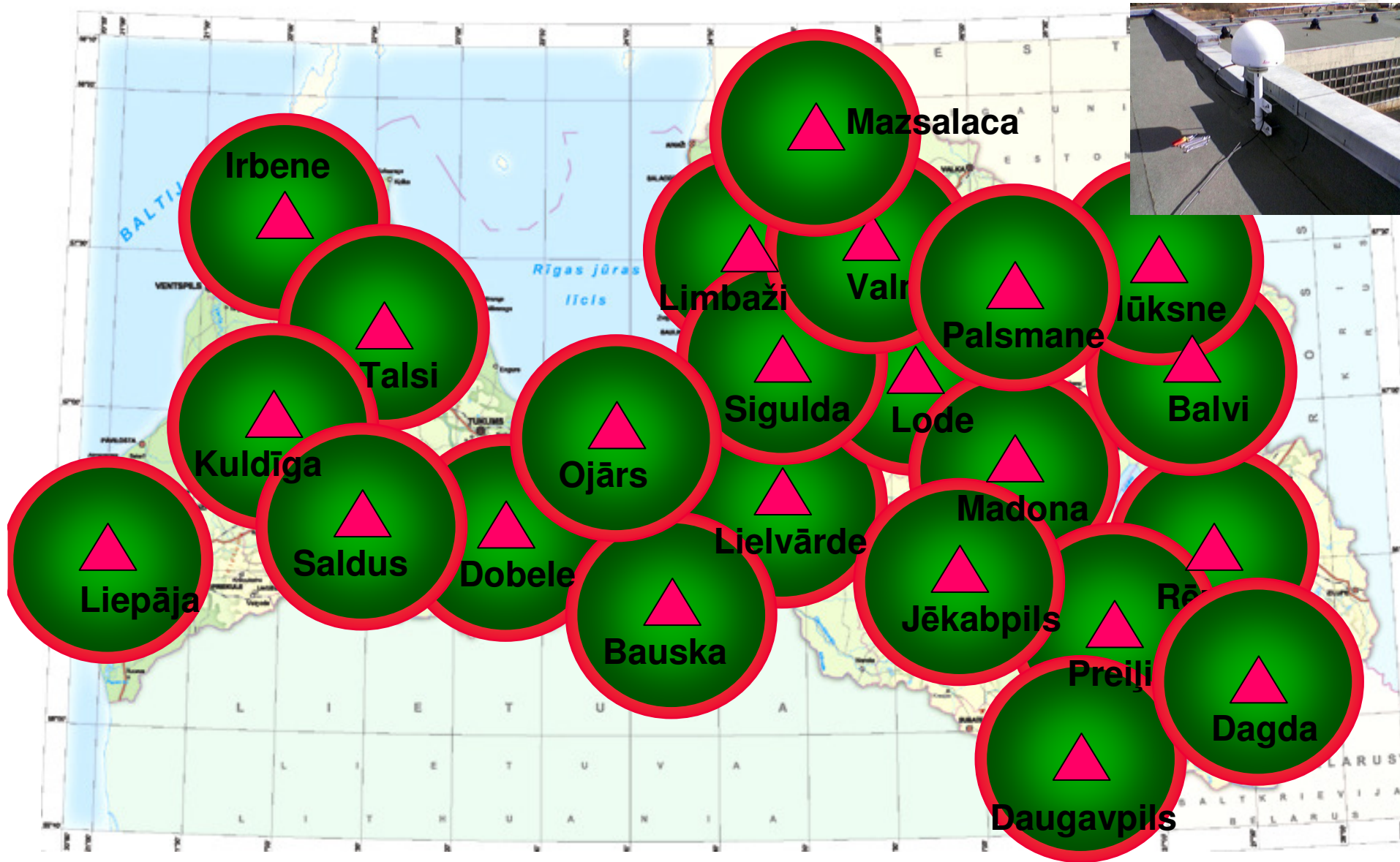
- DGPS



- Post processing data



LatPos pārklājums



LatPos users

- 75 companies
- 120 RTK licences
- 10 DGPS licences
- 500 post processing subscriptions



LatPos correction fee

- RTK 1 Year licence 656 EUR
- RTK 1 Month licence 96 EUR
- RTK 1 Day licence 19 EUR
- DGPS 1 Year licence 173 EUR



Thank You for attention!

- Janis Zvirgzds
 - Latvian Geospatial information Agency
 - GNSS permanent base station division
 - 43 O.Vāciesa street, Riga
 - E-mail: janis.zvirgzds@lgia.gov.lv
 - Phone: +371 29259135
 - www.latpos.lgia.gov.lv
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