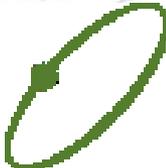




LAND SURVEY OFFICE

C Z E P  S

EUPOS 2021

Land Survey Office, Department of Geodetic Control

Jan Řezníček

Administration of CZEPOS network

C Z E P O S

compatibility of CZEPOS services with
global navigation satellite systems

2004
GPS NAVSTAR



2012
GLONASS



2017/18/19
GALILEO
BeiDou



Upgrade of Receivers 2018/19

Leica GRX 1200+ GNSS

- case since 2004
- new motherboard since 2012
- Leica support finished 2017



GPS+GLO+GAL+BEI compatible,

- not all current frequencies (f.e. GLONASS L2C or Galileo E6 is missing)
- not compatible with Trimble software used in APOS/ASG-EUPOS/SKPOS

Leica GR30

- 2018 first 8 stations
- 2019 remaining 17 stations



Galileo/BeiDou MSM services since 2018

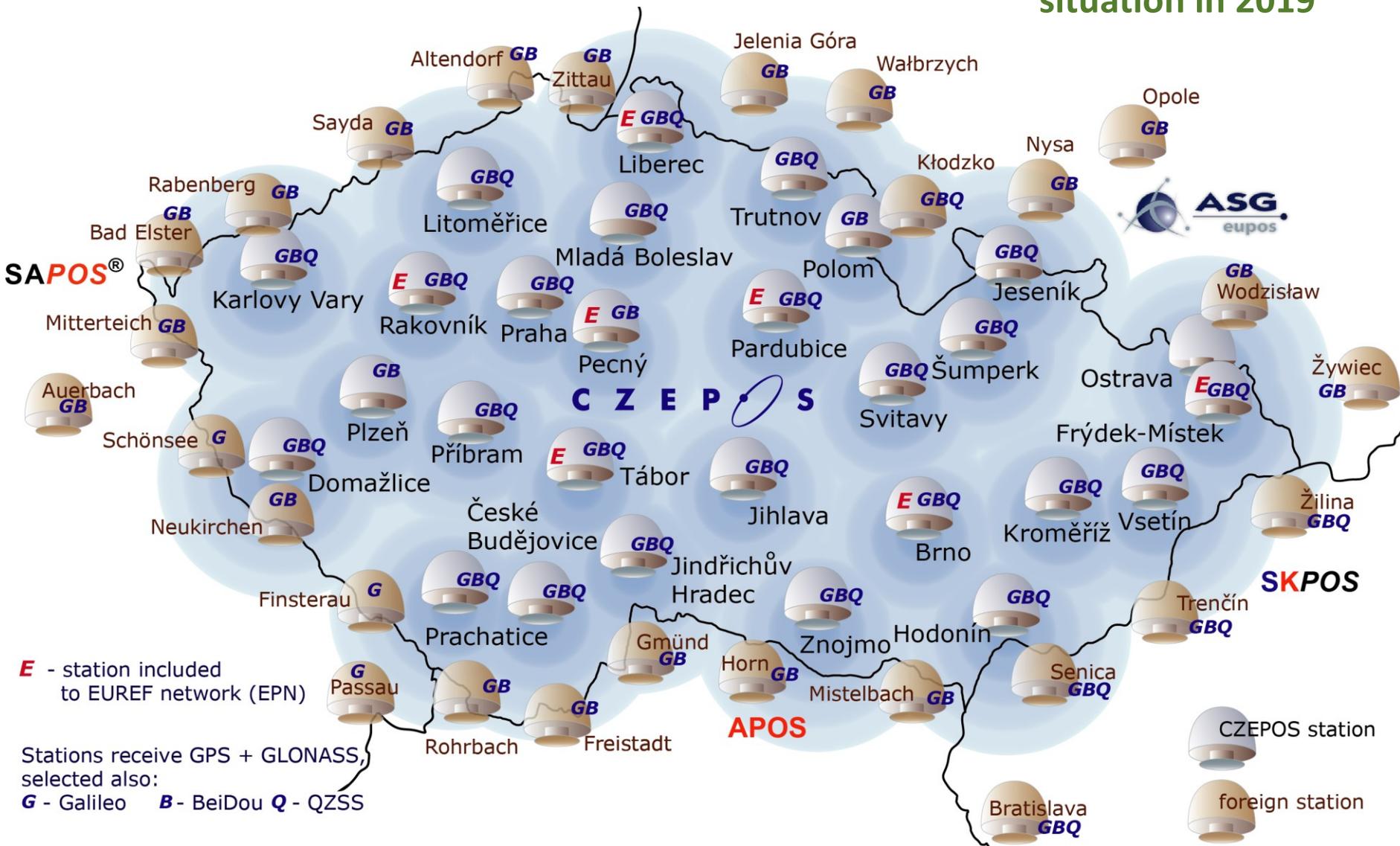
situation in 2018



MSM services only as a single site solution !

Galileo/BeiDou MSM services since 2019

situation in 2019



E - station included to EUREF network (EPN)

Stations receive GPS + GLONASS, selected also:
G - Galileo **B** - BeiDou **Q** - QZSS

MSM services also as network solution (VRS)

Galileo/BeiDou RINEX3 services since 2021

The screenshot shows the CZEPOS RINEX Data interface. At the top, there is a navigation bar with 'Home / Post Processing / RINEX Data'. A sidebar on the left contains icons for home, user, and navigation. The main content area features a 'RINEX Data' header and a progress indicator 'DOSTUPNOST DAT 17.47%' for a 30-day period. Below this is a descriptive paragraph in Czech. A date range selector is set to '2021-04-07 8:30' to '2021-04-07 09:00'. A search bar contains '(Název projektu)' and shows 'Vybráno: 2 Stanice, 4 Soubory (7.12 MB)'. A 'Virtuální RINEX' checkbox is present. A map of the Czech Republic shows station locations. A table lists station data:

Station	System	Receiver	Files	Completion	Selected
CRAK	GPS+GLO+GAL+BDS+QZSS	LEIAR25.R4 LEIT	2 Soubory	(100.00%)	<input type="checkbox"/>
CSUM	GPS+GLO+GLO+GAL+BDS+QZSS	LEIAR25.R4 LEIT	2 Soubory	(100.00%)	<input type="checkbox"/>
CSV I	GPS+GLO+GAL+BDS+QZSS	LEIAR25.R4 LEIT	2 Soubory	(100.00%)	<input checked="" type="checkbox"/>

A red arrow points to the checked checkbox for the CSV I station.

till 2021: Leica SpiderWeb software:

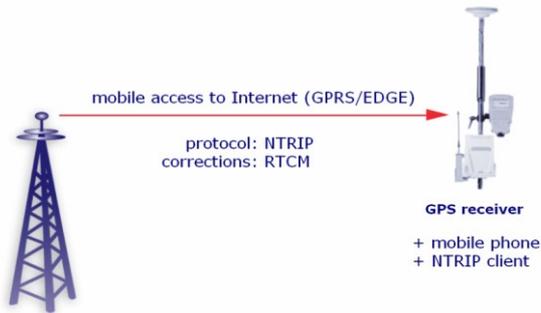
since 2021: Leica X-Pos software:

only RINEX2 (GPS+GLO)

only RINEX3 (GPS+GLO+GAL+BDS)

Administration of CZEPOS network

- 28 Czech stations
- 27 neighboring stations
- real-time services
- post-processing products
- GPS/GLONASS

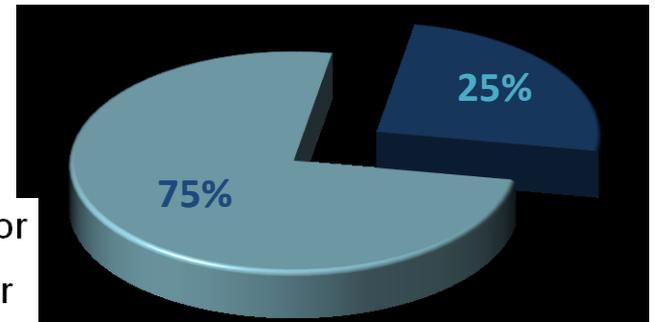


- 7 stations involved in EUREF permanent network (EPN)
- cooperation within EUPOS project

**2021/11: 2130 users
+100 since last year**

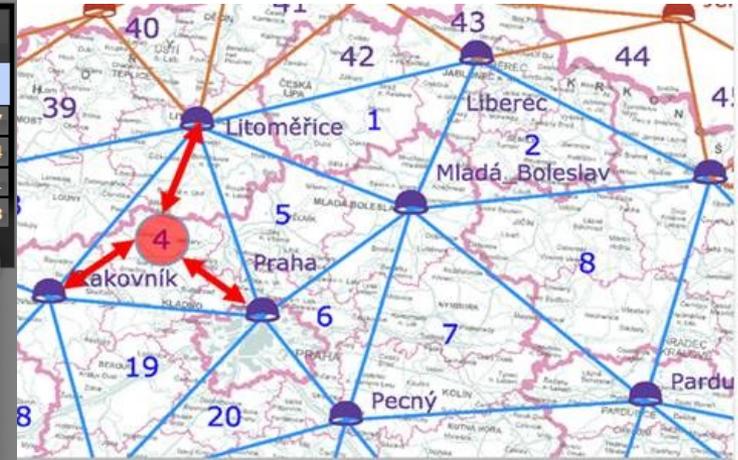
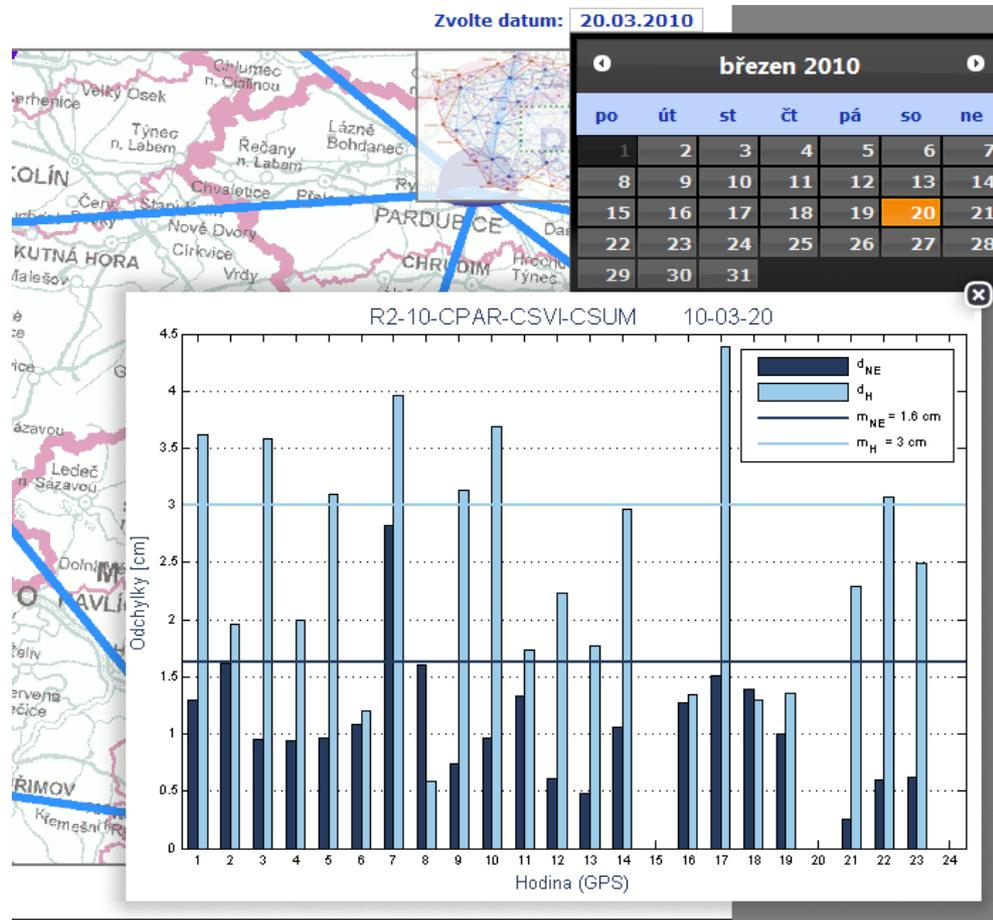


- private sector
- public sector



Administration of CZEPOS network

• monitoring of accuracy



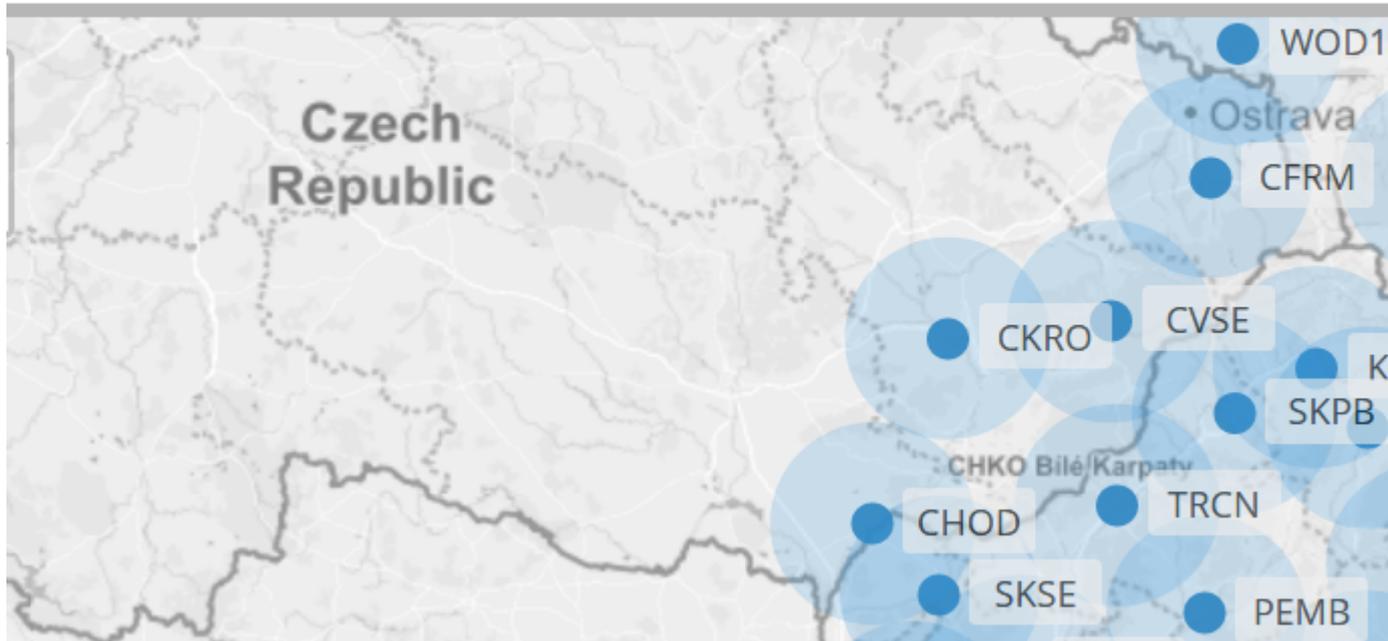
- Internet application, created in cooperation with CTU
- 75 testing areas on the territory of CR including border areas
- there are 3 testing baselines in each area
- each baseline is tested from RTK x VRS service

- since 2010
- upgrade 2021 (Galileo/BeiDou)

Administration of CZEPOS network



Service quality monitoring



- **since 2019 EUPOS SQM – 4 stations**

Administration of CZEPOS network

- monitoring of operation

ZEMĚMĚŘICKÝ ÚŘAD - CZEPOS - Mozilla Firefox

Soubor Úpravy Zobrazení Historie Záložky Oblíbené Nástroje Nápověda

ZEMĚMĚŘICKÝ ÚŘAD - ...

czepos.cuzk.cz/_serviceStatus.aspx

aktuální stav služeb RTK a DGPS
služby RTK a DGPS, závislé na výběru stanice

n	stanice	kód	RTK funkční	DGPS funkční	testováno
1	Pardubice	CPAR	ANO	ANO	7/17/2012 9:31:36 PM
2	Svitavy	CSVI	ANO	ANO	7/17/2012 9:33:04 PM
3	Jihlava	CJIH	NE	NE	7/17/2012 9:34:32 PM
4	Dačice	CDAC	ANO	ANO	7/17
5	Tábor	CTAB	ANO	ANO	7/17
6	Příbram	CPRI	ANO	ANO	7/17

výpis historie - služby virtuální referenční stanice a nejbližší stanice

vyberte službu: FKP zvolte datum: 17.07.2012

FKP
funkční

ANO

NE

17.7.01 17.7.02 17.7.03 17.7.04 17.7.05 17.7.06 17.7.07 17.7.08 17.7.09 17.7.10 17.7.11 17.7.12 17.7.13 17.7.14 17.7.15 17.7.16 17.7.17 17.7.18 17.7.19 17.7.20 17.7.21 17.7.22

Administration of CZEPOS network

• monitoring of operation

Monitoring permanentních stanic GNSS - Windows Internet Explorer

http://oko.pecny.cz/monitor/#d

Monitoring permanentních stanic GNSS

Dočasné uživatelské rozhraní do doby, než bude služba umístěna na webu ČUZK

Statuty stanic a souřadnice pro konkrétní den | Aktuální ověřené souřadnice | Celkový přehled | Nápověda | Webová služba

Nahoru

1. Statuty stanic a souřadnic

Stav pro den 20.1.2015 (úterý) - poslední vypočtený den

Vybrat:

Statuty stanic a ověřené souřadnice

Výsledky pro síťová řešení (z ultra rapid řešení)

Síť	Výsledek
CZEPOS	CZEPOS : Síťové řešení ověřeno
TRIMBLE	Trimble VRS NOW : Síťové řešení neověřeno

Výsledky pro jednotlivé stanice z ultra rapid řešení

Stanice	Popis	B			L			H (ell.)	Status	Dráhy (*.sp3), komentář
CBUD	České Budějovice	48	58	3.47154	14	28	30.97608	456.223	Overeno	ultra rapid, vypocet OK
CDAC	Dačice	49	04	47.20485	15	26	12.45539	534.730	Overeno	ultra rapid, vypocet OK
CDOM	Domažlice	49	26	45.25334	12	55	26.77675	519.603	Overeno	ultra rapid, vypocet OK

Cooperation with Research Institute of Geodesy and Cartography

New prices since 2017

DGPS Differential GPS	<ul style="list-style-type: none">• DGPS	20 Kč (0.78 €) / 1 hour
RTK Real Time Kinematic	<ul style="list-style-type: none">• RTK• RTK3-GG• RTK3-NS-GG	80 Kč (3.13 €) / 1 hour 60 Kč (2.35 €) / 1 hour
VRS Virtual Reference Station	<ul style="list-style-type: none">• RTK-PRS• RTK-FKP• VRS3-MAX, VRS3-iMAX• VRS3-MAX-GG, VRS3-iMAX-GG• VRS-MAX-GG_L4G• VRS-iMAX-GG_CMR, VRS-iMAX-GG_CMR+• VRS3-VirtualRS-GG	80 Kč (3.13 €) / 1 hour 60 Kč (2.35 €) / 1 hour

New prices since 2017

Real-time services:

- fixed monthly payment

RTK-PRS, RTK-FKP, MAX, iMAX, MAX-GG, iMAX-GG,
RTK, RTK3-NS, RTK3-GG,
DGPS

~~6 000 Kč (231.71 €)~~

1 000 Kč (39.12 €)

- fixed annual payment

RTK-PRS, RTK-FKP, MAX, iMAX, MAX-GG, iMAX-GG,
RTK, RTK3-NS, RTK3-GG,
DGPS

~~25 000 Kč (970.09 €)~~

10 000 Kč (391.24 €)

Post-processing products:

data interval: 1 – 4 seconds

~~80 Kč (3.13 €)~~ **50 Kč (1.96 €)**

5 – 9 seconds

~~16 Kč (0.63 €)~~ **10 Kč (0.39 €)**

10 – ... seconds

~~8 Kč (0.31 €)~~ **5 Kč (0.20 €)**

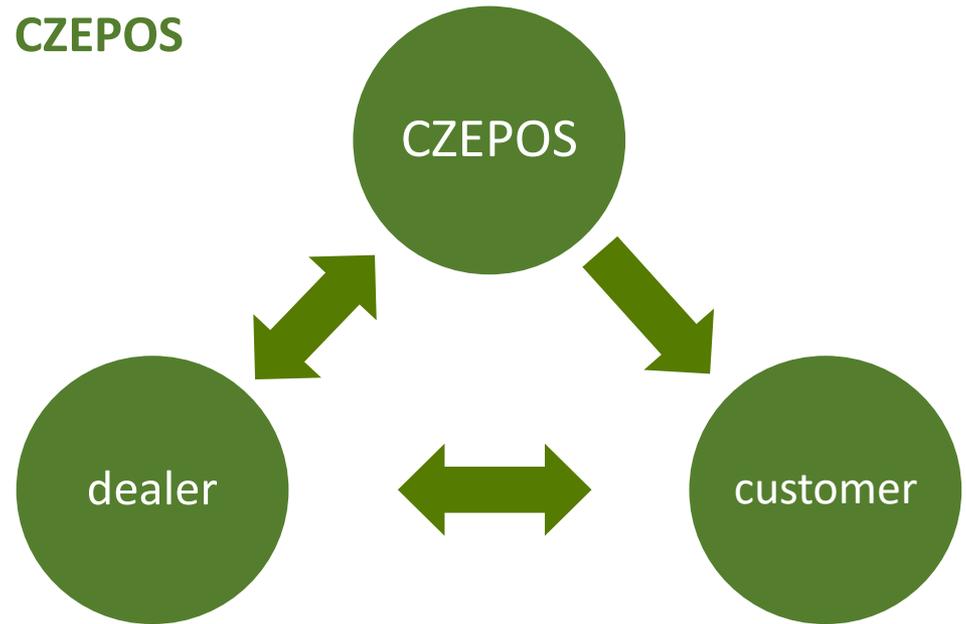
computation service

free of charge

CZEPOS – cooperation with dealers since 2018

- dealer register customers within CZEPOS

customers are still registered within CZEPOS



- dealer operates own GNSS software (virtual GNSS network)



dealer provides GNSS services to customers by his own GNSS software

CZEPOS – cooperation with dealers since 2021

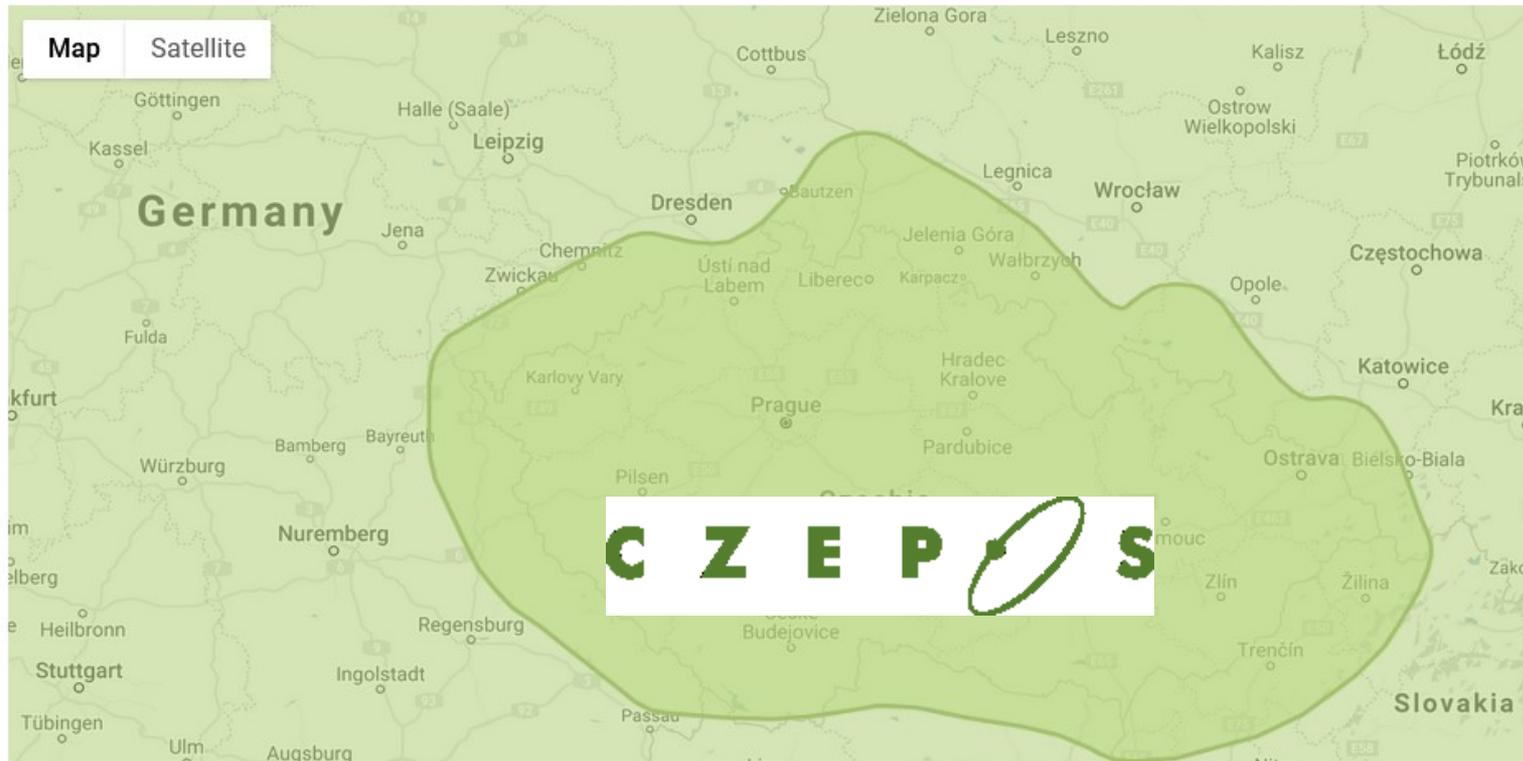


HxGN SmartNet

Služby Podniky Aplikace Jak to fu

Domů > Pokrytí

Pokrytí





thank you for your attention