



Alberding GNSS data management & monitoring tools

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Alberding GmbH

EUREF 2013 Symposium, 29-31 May 2013, Budapest, Hungary

Outline



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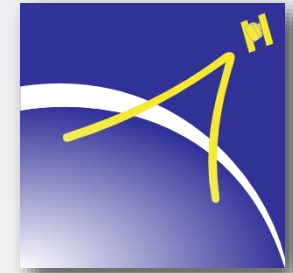
GNSS data management utilities

Professional monitoring solutions

Who is Alberding GmbH?



- Privately owned German GNSS software development company
- Founded in 1994
- Based in Schönefeld (Berlin)
- 9 engineers + external employees
- Independent from GNSS receiver manufacturers



Alberding GmbH experience



- GNSS data processing and analysis
- Internet based GNSS data communication
- Standardisation (Ntrip, RTCM MSM, SSR)
- Customised software and hardware development
- Complete system solutions
 - GNSS infrastructures
 - Monitoring systems





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GNSS data management utilities

Professional monitoring solutions

Plethora of signals and data formats



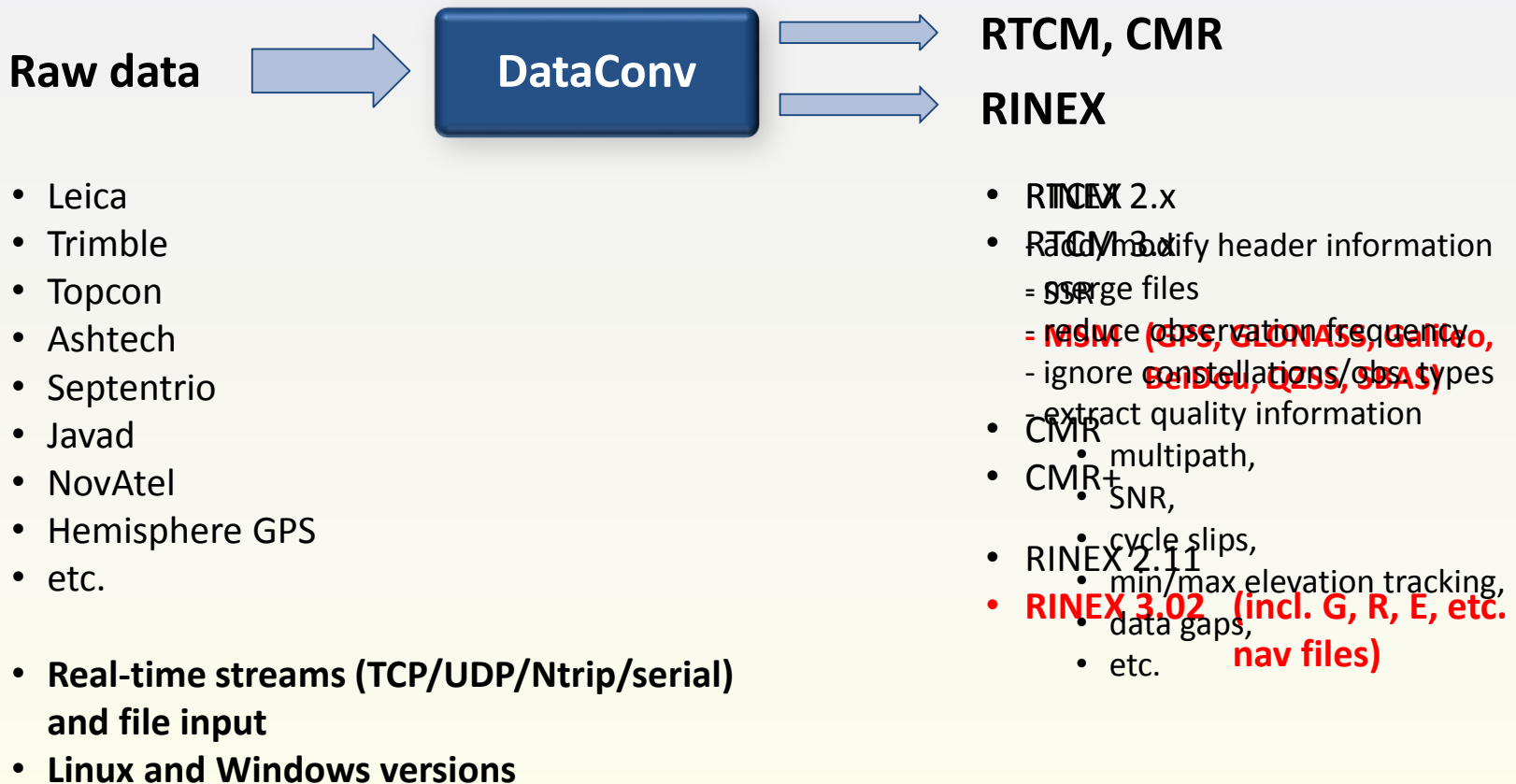
- Increasing need for "translator" applications



DataConv



- Data conversion tool



DataConv



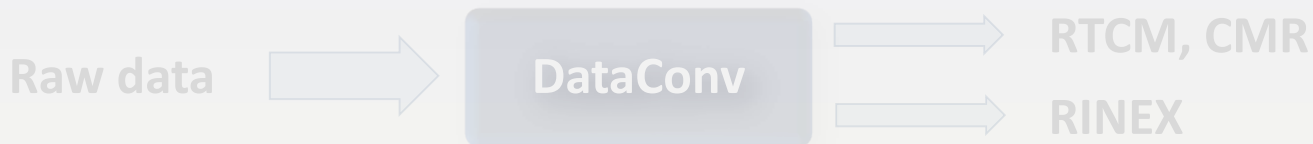
- Data conversion tool



DataConv



- Data conversion tool



InspectRTCM



- RTCM visualisation software for data content analysis



- Real-time visualisation
- RTCM, CMR, RTCA, raw binary input
- NMEA GGA sending
- Transmission delay analysis
- **Real-time streams (TCP/UDP/Ntrip/serial) and file input**
- **Linux and Windows versions**



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GNSS data management utilities

Professional monitoring solutions

What and how to monitor?



- **What do we monitor:**

- Data availability, age and content
- Satellite tracking performance
- Position
- Accuracy
- Object geometry
- Motion and deformation
- Operating status



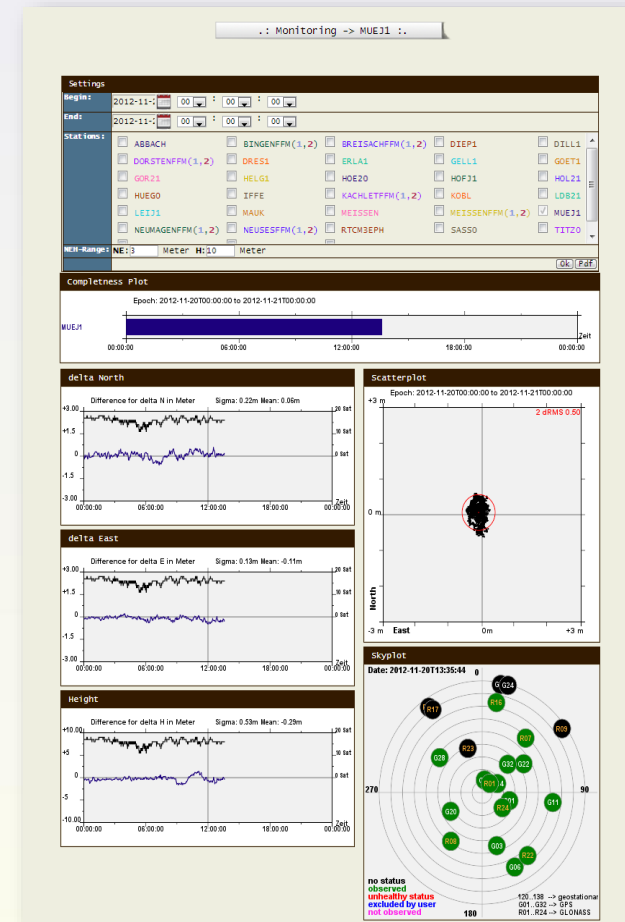
- **How do we monitor:**

- GNSS receivers (single- or dual-frequency, GPS-only or GPS+GLO), total stations, laser scanners, geotechnical and meteorological sensors
- Single- or multi-station architectures
- Centralised or decentralised configurations
- Post-processed or real-time analysis
- Various GNSS processing techniques (DGNSS, RTK, PPP)
- Accuracies: sub-metre to <1 cm
- Sampling rates: up to 10 Hz or more

Alberding monitoring software features



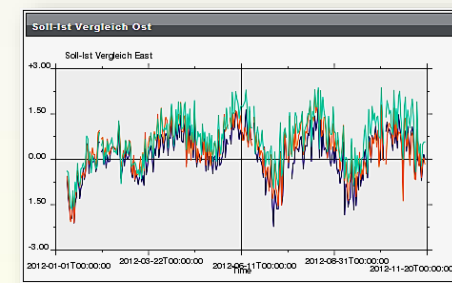
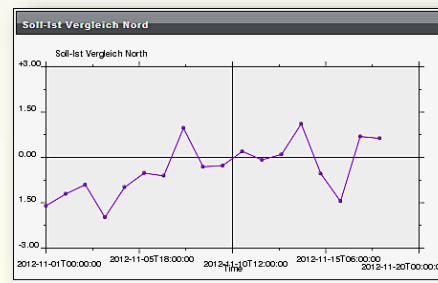
- Scalable solution
- Modular architecture
- Web based graphical user interface
 - Comprehensive status tables
 - Time series and scatter plots
 - Availability bar graphs
 - Map display of stations and users
 - Statistical tables
 - Comparative performance evaluation
- Automated alert system (email/SMS)
- Status report generation



Post-processed PPP monitoring



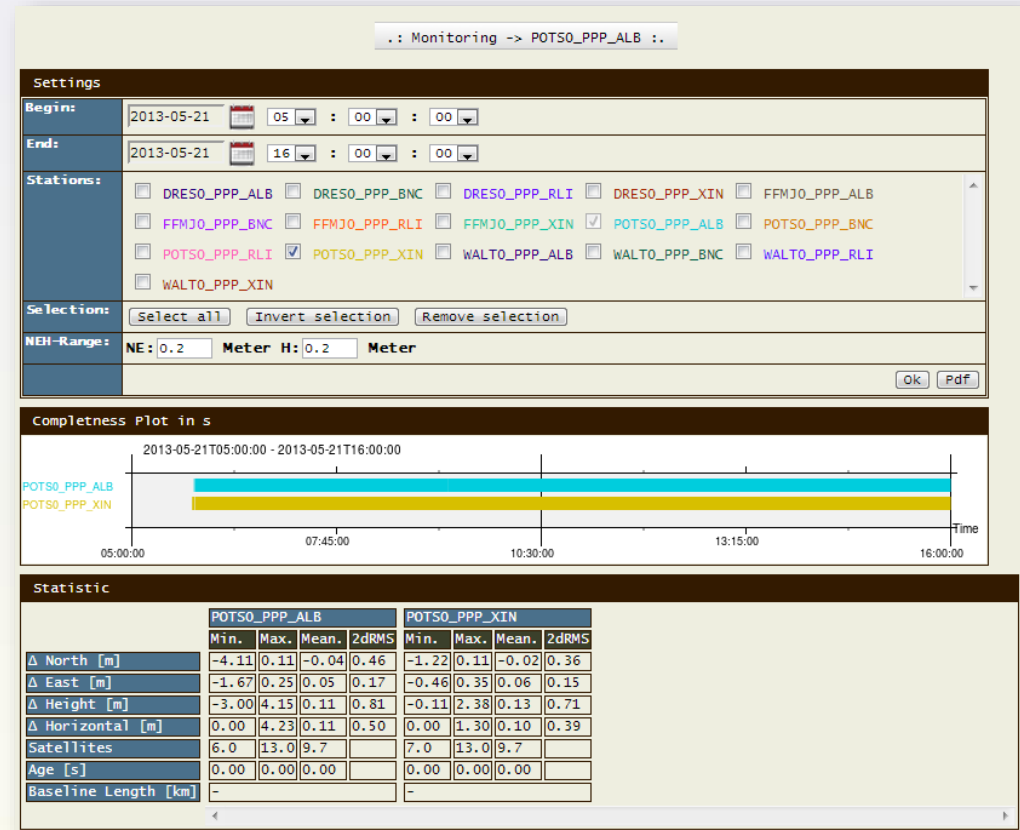
- Reference station coordinates
- Independent from the RTK networking algorithms
- Post processing of 24h RINEX files
- Web based status monitoring
- History data on time series plots
- Comparative analysis, differential plots
- Customisable alarm generation



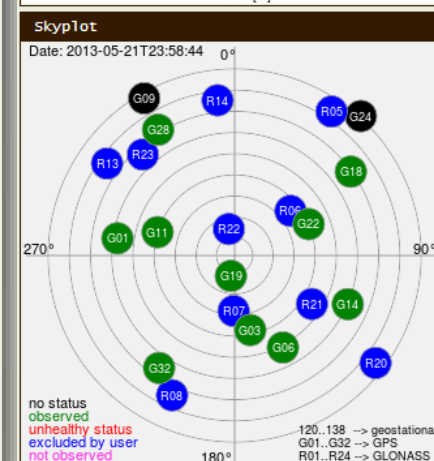
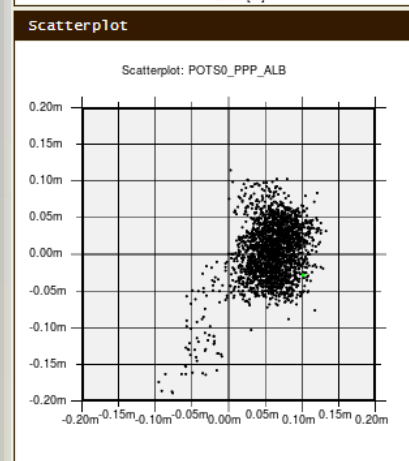
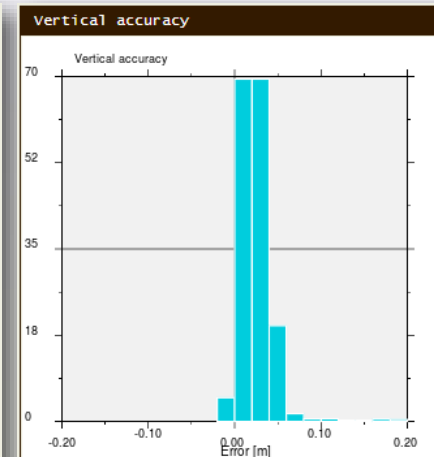
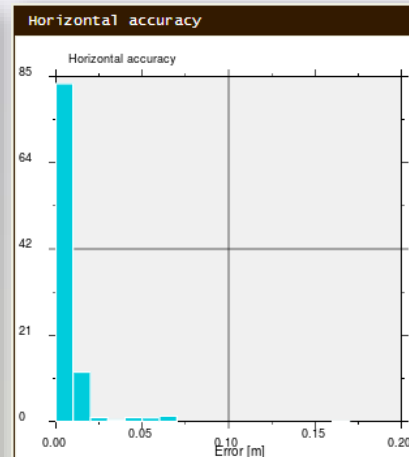
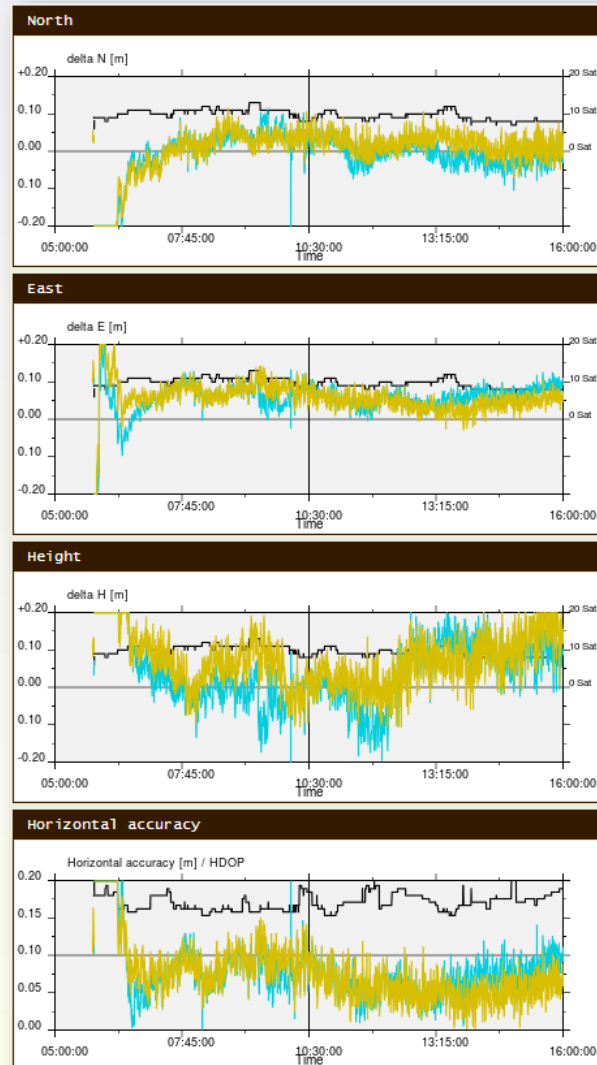
Real-time PPP monitoring



- Real-time raw data input
- RTCM 3.x SSR input
(e.g. IGS combined RT products)
- Various PPP algorithms
(Alberding PPP, BNC, RTKLIB)
- Comparative analysis
(between stations or
between orbit/clock products or
between PPP algorithms)
- Custom display settings
- Statistical computations



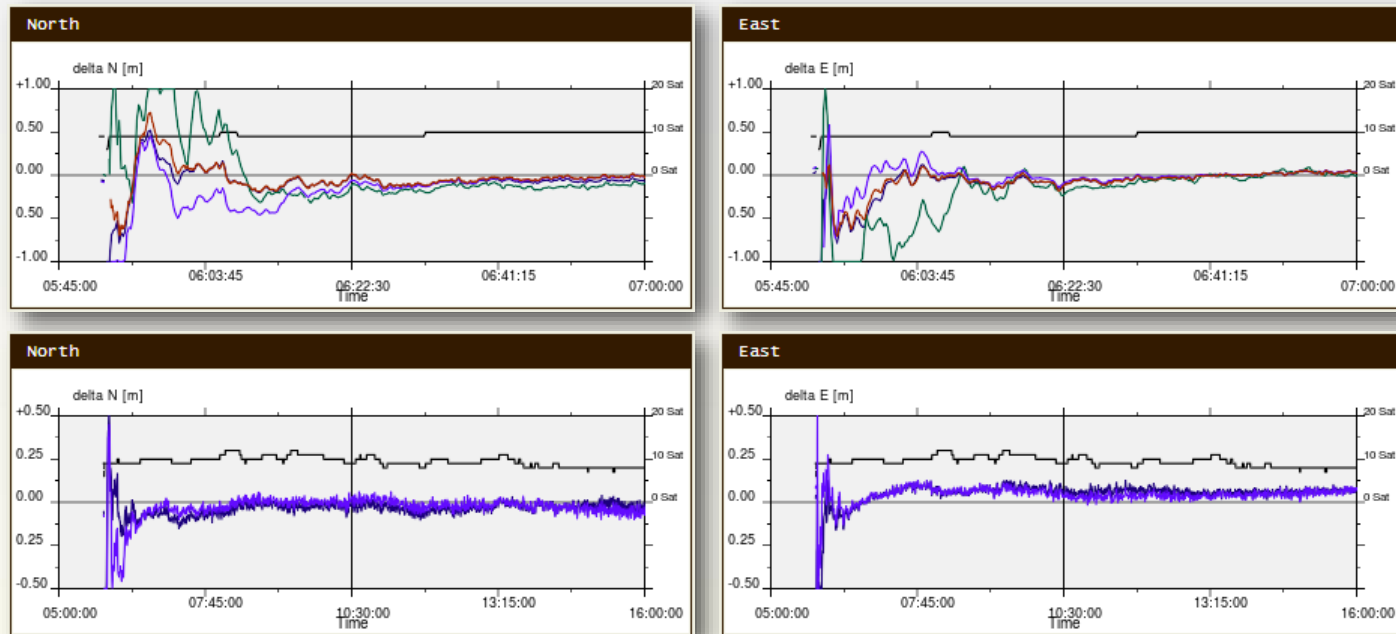
Real-time PPP monitoring cont'd



PPP convergence time analysis



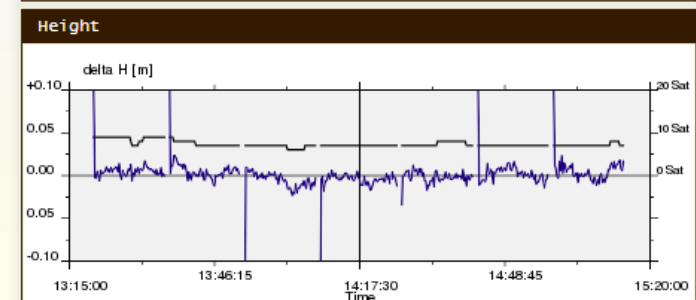
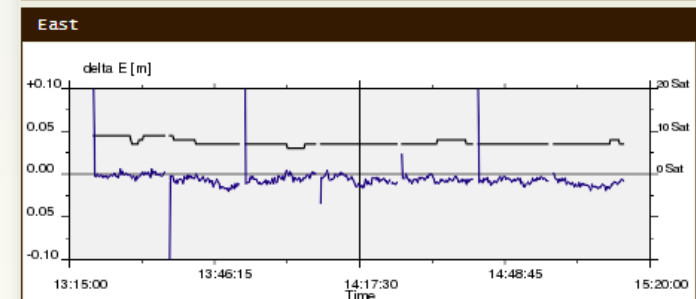
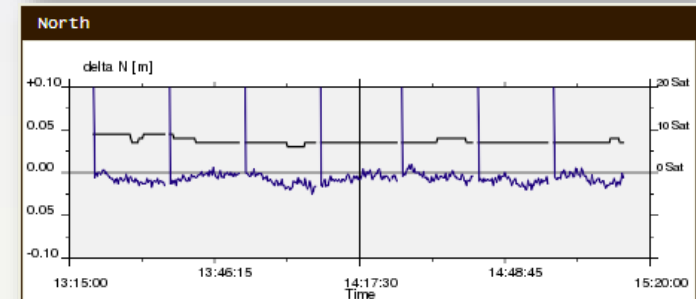
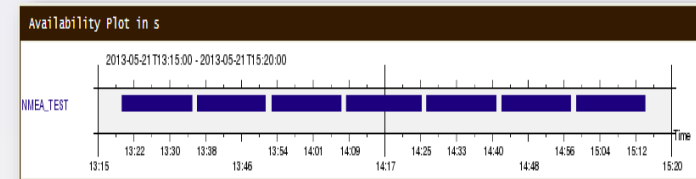
- Repeated re-convergence
- Statistical analysis



RTK TTFA analysis



- Central or rover fw based RTK position computation
- Various RTK/Network RTK solutions
- Comparative analysis (between stations or between processing concepts)
- Repeated re-initialisation
- Statistical computations
- Wrong fix detection

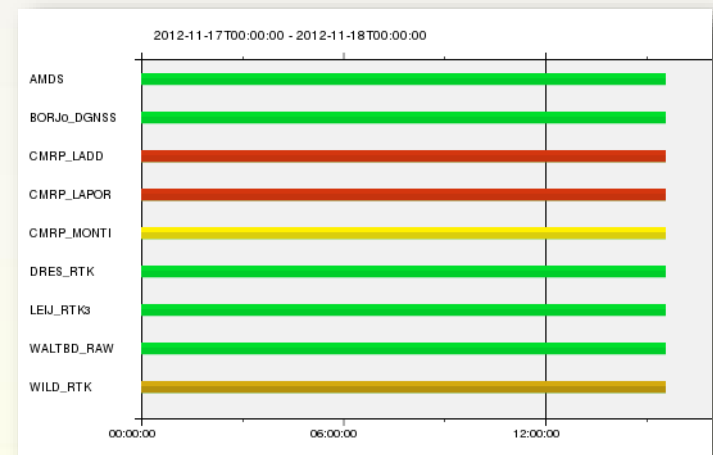


Ntrip Caster monitoring



- Data stream availability and content analysis (RTCM, CMR, raw data)
- Data age analysis
- Monitoring third party casters
- Monitoring multiple casters from a single website
- Colour-coded status tables and bar graphs
- User-defined sampling rate and alarm thresholds

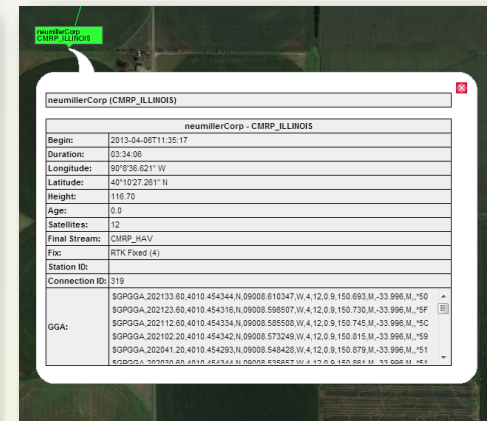
Statistics									
Stream	Caster	Activation	Last Accessed	Connection Error		Message Error		Data Age Error	
				Σ	Last (%)	Σ (Empty, Wrong)	Last (%)	Σ	Last (%)
AMDS	alberdingcaster.dgpsonline.eu	2012-10-22T15:40:05	00:01:33	0	3 day(s) 04:56:28 (0.00 %)	0 (0, 0)	3 day(s) 00:04:21 (0.00%)	disabled	
BORJO_DGNSS	alberdingcaster.dgpsonline.eu	2012-10-22T15:40:05	00:01:32	0	3 day(s) 04:56:28 (0.00 %)	0 (0, 0)	3 day(s) 00:04:21 (0.00%)	0	00:00:00 (0.00%)
CMRP_LADD	199.102.46.67	2012-11-05T10:09:10	12 day(s) 05:10:31	no connection!					
CMRP_LAPOR	199.102.46.67	2012-11-05T10:07:40	12 day(s) 05:10:31	no connection!					
CMRP_MONTI	199.102.46.67	2012-11-05T10:30:23	3 day(s) 22:29:29	0	3 day(s) 22:29:29 (0.00 %)	0 (0, 0)	10 day(s) 23:39:31 (0.00%)	0	00:00:00 (0.00%)
DRES_RTK	alberdingcaster.dgpsonline.eu	-	10 day(s) 02:37:32	inactive!					
LEIJ_RTK3	alberdingcaster.dgpsonline.eu	2012-10-22T16:04:47	00:01:33	0	3 day(s) 04:56:28 (0.00 %)	0 (0, 0)	3 day(s) 00:04:21 (0.00%)	0	00:00:00 (0.00%)
WALTBDO_RAW	alberdingcaster.dgpsonline.eu	2012-10-22T15:40:05	00:01:33	0	3 day(s) 03:20:29 (0.00 %)	0 (0, 0)	12 day(s) 05:10:31 (0.00%)	0	00:00:00 (0.00%)
WILD_RTK	ntrip.dgpsonline.eu	2012-10-22T14:40:51	00:01:33	no data!					



Alberding Ntrip Caster user map display



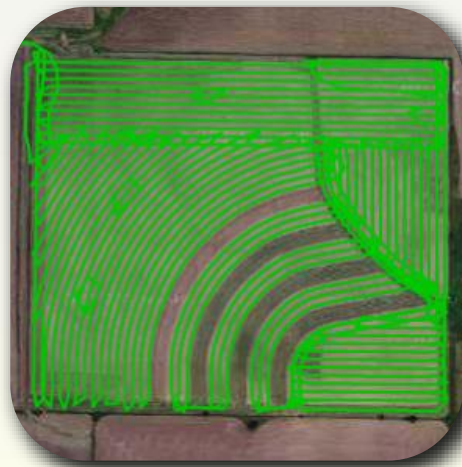
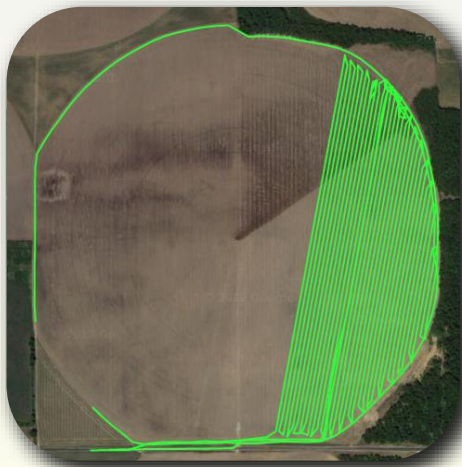
- User NMEA GGA messages
- Map display of real-time position information and quality indicators
- Fleet management
- E.g. agricultural machinery



Alberding Ntrip Caster user map display



- History data analysis
- KML file generation – map display
- Colour-coded RTK fixing status indicator
- Troubleshooting assistance (e.g., correction reception issues)



Future developments



- Alberding GmbH is committed to support the increasing versions of RTCM 2.x, 3.x, RINEX 3.xx and other standard formats
- Ambiguity-fixed PPP positioning with regional augmentation
Goal: instantaneous cm accuracy using state space algorithms



Thank you for your attention!

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IGS RT Service availability monitoring





International GNSS Service
 Formerly the International GPS Service

Products	Network	Projects	Events	Organization
About	Mail	FAQ	Publications	FTP
				Site map

Real-time Service

User Access
 Products
 RTS Monitoring
 Contributors
 More Information
 Support

Product Quality

RTS Status
[Availability of Service Figure](#)

Status and historical information regarding the availability of IGS Real-time Service product streams is available through the RTS Product Distribution Center at BKG.

IGS-Monitoring



MONITORING
MAP
 CASTER: PRODUCTS.IGS-IP.NET

SUMMARY
 VERBOSE

MONITORING

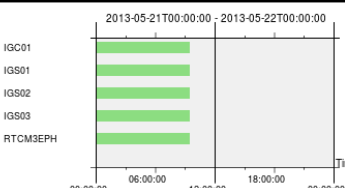
Reload in: 0 day(s) 00:00:40

All	Offline	Online	Warning
5	0	5	0

Plot	Stream	Duration	Outage Month (Day)	Connections Month (Day)
☒	IGC01	7 day(s) 20:14:03	0.21%(0.00%)	11(0)
☒	IGS01	5 day(s) 13:57:59	0.19%(0.00%)	12(0)
☒	IGS02	4 day(s) 05:21:46	0.22%(0.00%)	13(0)
☒	IGS03	4 day(s) 09:00:31	0.26%(0.00%)	15(0)
☒	RTCM3EPH	15:50:27	30.80%(0.00%)	11(0)

Outage Plot

2013-05-21T00:00:00 - 2013-05-22T00:00:00



Time

00:00:00 06:00:00 12:00:00 18:00:00 00:00:00

Begin 2013-05-21 00:00:00

End 2013-05-22 00:00:00

Show PDF

Alberding GmbH :: www.dgpsonline.eu

Supported data formats



Currently supported:

InspectRTCM:

- RTCM, RTCM3 (nearly 100%)
- CMR (100%)
- CMR+ (except GLONASS-Trimble)
- CMRx and consorts (only type numbers)
- Javad (many important messages)
- Trimble (some important messages)
- SiRF (some important messages)
- NCT (a few messages)
- Raw GPS (100% for old GPS, new signal structure [L2C,L5] missing)
- Raw SBAS (100%)

Raw data:

- RTCM3, RTCM3 3.2 (MSM)
- Ashtech raw binary
- Navis BINR
- Hemisphere
- CMR, CMR+, CMR+ Leica GLONASS
- Javad/Topcon GRIL/GREIS (including newest GNSS data)
- Leica LB2 (including newest GNSS data)
- MNP
- NovAtel OEM 3, 4, 5
- RTCM2
- Septentrio SBF (also new GNSS)
- SiRF
- TurboBinary
- Trimble RT17 und RT27 (also new GNSS)
- Trimble dual antenna receivers RT27
- TSIP
- UBLOX
- SOC streaming

For the new GNSS some ephemeris may be missing for some receiver types, but this changes constantly.

On request would be possible:

InspectRTCM:

- Raw messages for other GNSS
- More Javad types
- More RT17 Trimble types
- SBF
- more SiRF types
- TSIP
- more RTCM2, RTCM3 (only few missing)
- Navis BINR
- ...

Raw data:

- ATOM (Ashtech)
- Ashtech ASCII formats
- Updates for open formats (SBF, RTCM, SiRF, TSIP, UBLOX, NovAtel, ...)