


GPS Positioning Infrastructure 

The OSi National Network RTK Solution


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This presentation

- GPS network development stages
- OSi 'Network RTK' solution
- Technical challenges
- Using the realtime network
- Future developments / enhancements
- Network RTK - Launch




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GPS Network Development Stages

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Development Stages

- CIL DGPS active stations (3)
- OSi active GPS network (10)
- OSi Dublin RTK network (4)
- OSNI active GPS network (3)
- Positions computed by Nottingham University to Euref Zero Order Class B standard
- OSi Realtime network addition (2)
- Imminent move of one OSi Dublin active station to Midlands



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Ordnance Survey Ireland | Copyright: Ordnance Survey 2004 | Station Details by Area | Technical Document Document Reference: 2

Address: <http://www.osi.ie/gps/secure/rtk/health/index.asp>

Station health by GPSID:



Station Health Monitor On-line

Station health search:

Date: Search

Search Results

Station	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Dillon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colby	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sligo Harp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wexford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fingal CC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tallaght College	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NU Galway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kilbenny Hosp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Limerick Univ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Colt Institute of Technology	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Ross	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cavan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0


Key
 Indicates PRN file available for a given hour (e.g. 14:00hrs)
 Indicates no PRN file available

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OSi Dublin RTK Network

- Belfield
- Phoenix Park
- Swords
- Tallaght

- Based on GSM communications
- Launched for beta testing during 2002

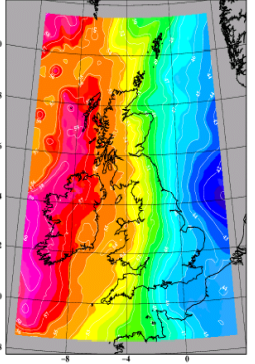


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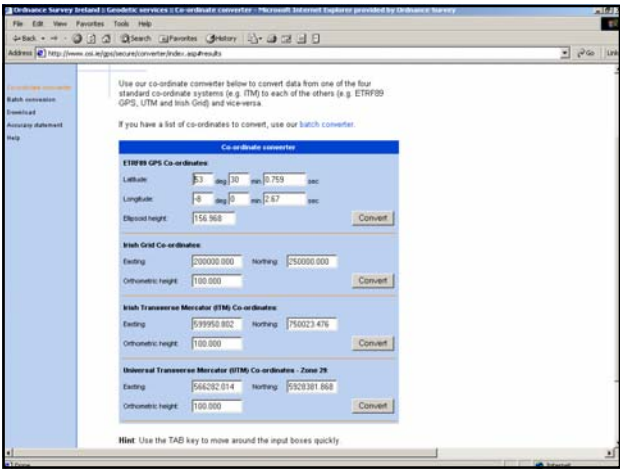
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OSGM02 Geoid Model

- Joint OSi, OSNI, OSGB initiative
- Converts GPS ellipsoidal heights to orthometric heights
- Accuracy of 4 to 6 cm for Ireland



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OSi Network RTK Solution

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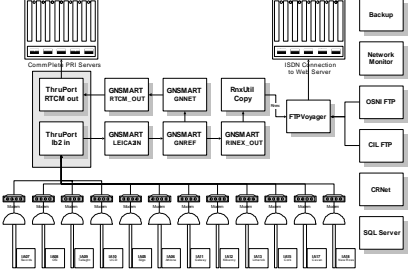
OSi Network RTK Solution

- Implemented by SIS / Leica GeoSystems
 - GNSMART
 - CR500 dual freq. receivers
 - CRNet
- Properties
 - GSM solution
 - Single number dial in
 - Up to 170 simultaneous users
 - Vendor independent
 - ETRF89 referenced
 - ITM compliant




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Software / hardware components and connectivity

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Technical Challenges

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Technical Challenges

Very recent technology

- Communications
 - Maintenance of active GPS stations independent of PSTN / Broadband communications
 - Multiple simultaneous GSM users accessing network solution via a single dial-up telephone number
- Network security & stability

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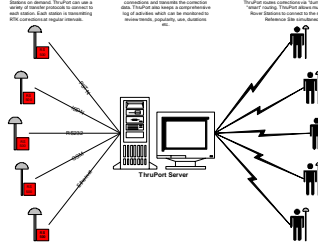
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Technical Challenges

ThruPort connects to RTN Receiver
Receiver connects to ThruPort via a variety of interface protocols to connect to each receiver. Each receiver is receiving RTN correctional signal intervals.


ThruPort puts all of the incoming corrections and updates the correction table.
ThruPort also issues a correction table to each receiver via the interface.

Receiver Stations connect into ThruPort.
ThruPort connects to each receiver via a variety of interface protocols. Receiver Stations connect to ThruPort via a variety of interface protocols.




The SIS 'ThruPort' Server

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Technical Challenges




Internal and External DMZ

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Using the Realtime Network

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Using the Realtime Network

OSi experience has shown

- Initialisation time 1-2 mins
- Re-initialisation time 1-2 mins (redial)
- Network extensibility
- Positioning accuracy
 - Planimetric 3 cm RMSE
 - Height 7 cm RMSE

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Using the Realtime Network

Performance factors outside of OSi control

- GPS signal provided by US Military
- Ionospheric effects
- GSM coverage / stability from Service Provider
- Stability of Eircom PSTN / Broadband communication network

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Using the Realtime Network

Users should

- Test network in consultation with GPS instrumentation supplier
- Ensure proper GPS survey methods & practice
- Mission planning to minimise Ionospheric effects
- Consult OSi GPS website

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Using the Realtime Network

User Support


- GPS Instrument Supplier
 - RTK settings
 - Firmware / latest version of RTCM
- OSi
 - Phone: 01-8852 456
 - Website: www.osi.ie

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Future Developments / Enhancements

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Network RTK Solution

Future Developments / Enhancements

- Moving of one Dublin active GPS station to the midlands
- OSi website support message board
- Addition of 3 OSNI active GPS stations
- Second OSi Dublin active station to move to the west

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Network RTK Launch

0818 300 500

- Service Provider – GSM national call rates

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Thank you for your attention