

STARFIX.MRDGPS



MRDGPS (Multi Reference Differential GPS) is part of Fugro's StarFix suite of integrated navigation software, providing the most advanced DGPS positioning and QC available. Each display screen can be easily configured by the user to cater for all possible needs.

The primary function of the MRDGPS software is to use all available DGPS data collected

and computed at the mobile unit to provide the user with a realtime indication of the position performance. This is achieved by presentation of quality parameters as recommended by UKOOA.

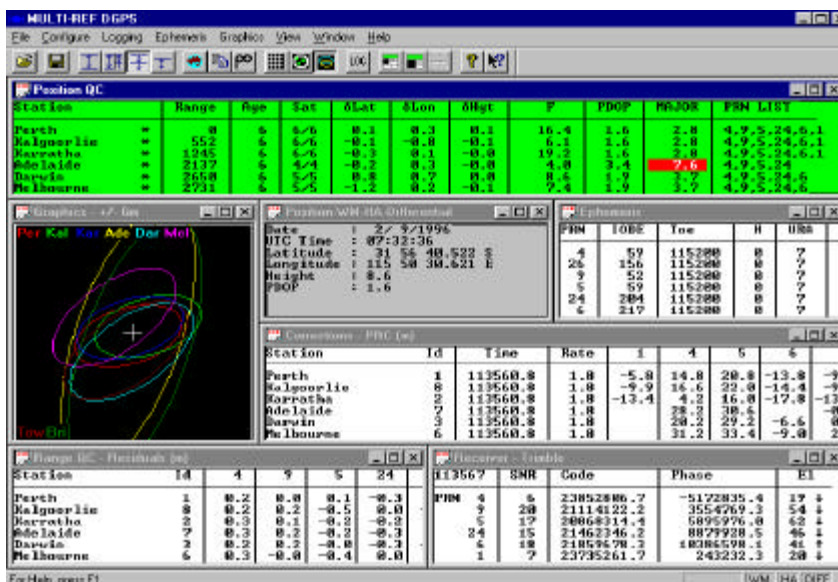
Multiple Reference Stations

DGPS corrections can be received from up to 12 individual reference stations either in Fugro's proprietary Super-compressed format or from

individual and multiple RTCM sources. Independent positions from each can be computed and combined to provide a Weighted Mean (Position Domain) or Virtual Base Station (VBS correction domain) solution with optional automatic switching. This provides increased accuracy and minimises the errors affecting a single reference station.

Automatic Position Fix QC

Prior to the final position computation, all pseudo ranges are statistically tested for gross errors using the ω -test method (data snooping). Each observation is carefully weighted taking into account satellite elevation, age of differential corrections, distance from the reference station and rate of change of correction. Ionospheric and tropospheric models plus carrier phase smoothing can be selected for enhanced performance over extended distances.



MAIN BENEFITS

- Multiple reference station solution in both the correction and position domain with 3D or 2D (fixed height or height aided) solutions.
- All reference station data used to ensure the reliability and integrity of derived positions.
- Calibration of conventional radio navigation systems.
- Statistical testing for gross errors, ω -test and F-test.
- Online configuration and user selection of items displayed on all windows.
- Automatic switching (optional) between positioning modes weighted mean VBS, 2D or 3D.
- QC of data on the any machine attached to a LAN.
- Statistical analysis according to the UKOOA recommendation of the final fix computed (error ellipses, MDE and external reliability).
- Logging capability.
- Replay of logged files.
- Output of VBS corrections.
- Online plots of SDUW, residuals, corrections, HDOP, height, etc.

Masks and Warnings

Masks of data age, DOP, RMSE, number satellites and stations, elevation, Standard Deviation and size of error ellipse can be used for automatic rejection or warning displays.

Online Configuration

MRDGPS can be modified online to display any parameters that the user may require with each window completely configurable to allow the display of any item of interest.

Automatic Position Switching

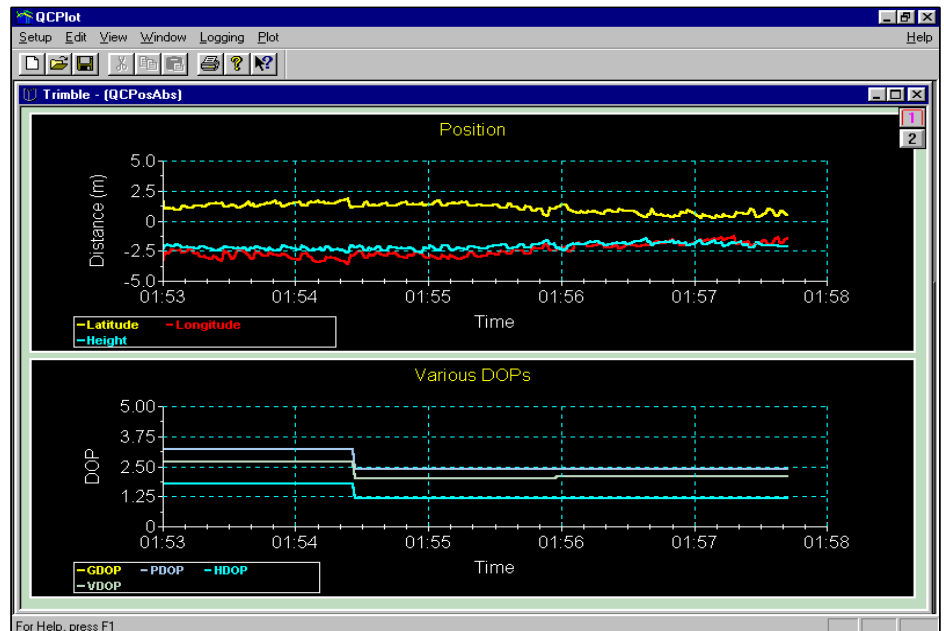
MRDGPS can compute (3D or 2D with fixed height or height aided) position using the multiple base station, virtual base station, single base station solutions, stand alone position plus height aiding with optional automatic switching between these modes providing the user with the ultimate ability for selection to ensure continual navigation.

IOWIN

Interfacing is handled by another StarFix application called IOWIN which handles the interfacing for Input and Output devices and enables online configuration of the device. Each I/O function is handled by a separate driver which can easily be modified or created for new hardware without altering the main applications.

QCQPLOT

QCQPLOT is a separate application which can be run alongside MRDGPS or on a separate computer running on a Local Area Network. QCQPLOT provides Time Series Plots, Statistics, Histograms and Scatter Plots in realtime or play back.



Estimated Position Accuracy

Estimates of the accuracy of the calculated positions are based on a-priori parameters and residuals of the GPS range measurements. This information also affects the weighting of the corrections into a multiple reference station solution.

Graphical Presentation

The time series plots include GPS data such as:

- First differences
- Height and filtered height

- HDOP, VDOP, GDOP, EDOP, NDOP
- Normalised residuals
- Static position comparisons
- Standard deviation of unit weight
- Age of corrections
- F-test statistics
- Marginally Detectable Error (MDE)
- Pseudo range corrections

Hardware Requirements

The software will run on a standard Pentium / 486 PC running Windows 95 or NT.

External Interfaces

Several formats are supported for interfacing to external computers. Among these are:

NMEA GGA & GLL
Trimble 4000, DNAVN
Propriety outputs.

Other formats available on request

The STARFIX system is available worldwide. For further information or service contact: **Australia:** Fugro Survey Pty Ltd Tel: +61-8-9322-4955 Fax: +61-8-9322-1775. **Dubai:** Oceonics (Asia Pacific) Ltd Tel: +971-2-474-900 Fax: +971-2-477-301. **India:** Fugro Geonics (India) Pvt Ltd Tel: +91-22-767-1059 Fax: +91-22-767-2818. **Indonesia:** PT Kalvindo Raya Semesta Tel: +62-21-830-0894 Fax: +62-21-829-0678. **Italy:** Oceanismica SpA Tel: +39-6-521-9319 Fax: +39-6-521-9297. **Netherlands:** Fugro Survey BV Tel: +31-23-535-9294 Fax: +31-23-533-1398. **Nigeria:** Fugro Survey (Nigeria) Ltd. Tel: +234-84-235095 Fax: +234-84-233991. **Norway:** Fugro-Geoteam AS Tel: +47-22 52 24 00 Fax: +47-22 52 34 38. **Singapore:** Fugro Geodetic Pte Ltd Tel: +65-543-0200 Fax: +65-534-0500. **United Kingdom:** Fugro-UDI Ltd Tel: +44-1224-257500 Fax: +44-1224-257501. **USA:** John E Chance & Associates Inc Tel: +1-713-773-5670

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