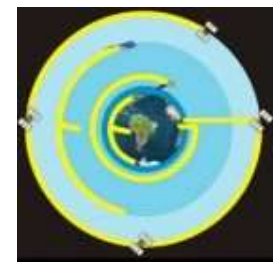
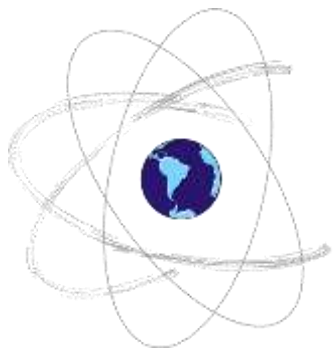




3º Workshop do Projeto Temático FAPESP Processo 2006/04008-2

RTK em rede na FCT/UNESP baseado no sistema TRIMBLE VRS³Net™



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Introdução

- Posicionamento em tempo real → cada vez mais utilizado;
- Evolução das técnicas de comunicação e transmissão de dados GNSS;
- Softwares para processamento em tempo real;
- Contexto: RTK e RTK em Rede.

Aplicações Atuais do RTK

- Desenvolvimento Científico;
- Monitoramento de Estruturas;
- Obras de Engenharia;
- Agricultura de Precisão;
- Geodésia;
- Navegação Marítima;
- Mapeamento e GIS.



Desvantagens do RTK

- Uma única estação de referência;
- Comunicação (UHF);
- Fonte de energia;
- Perda de produtividade;
- Distância limitada.



Solução: Utilizar mais estações de referência!

Vantagens do RTK em Rede

- Alta acurácia;
- Menores custos;
- Maior confiabilidade e disponibilidade;
- Um equipamento em campo;
- Modelagem dos erros atmosféricos;
- Maior distância;
- Alta produtividade;
- Geração de correções



(MAC, RTX, VRS, etc.)



VRS

- Ideia básica: gerar uma estação que não existe fisicamente, mas que simule uma estação próxima ao *rover*.



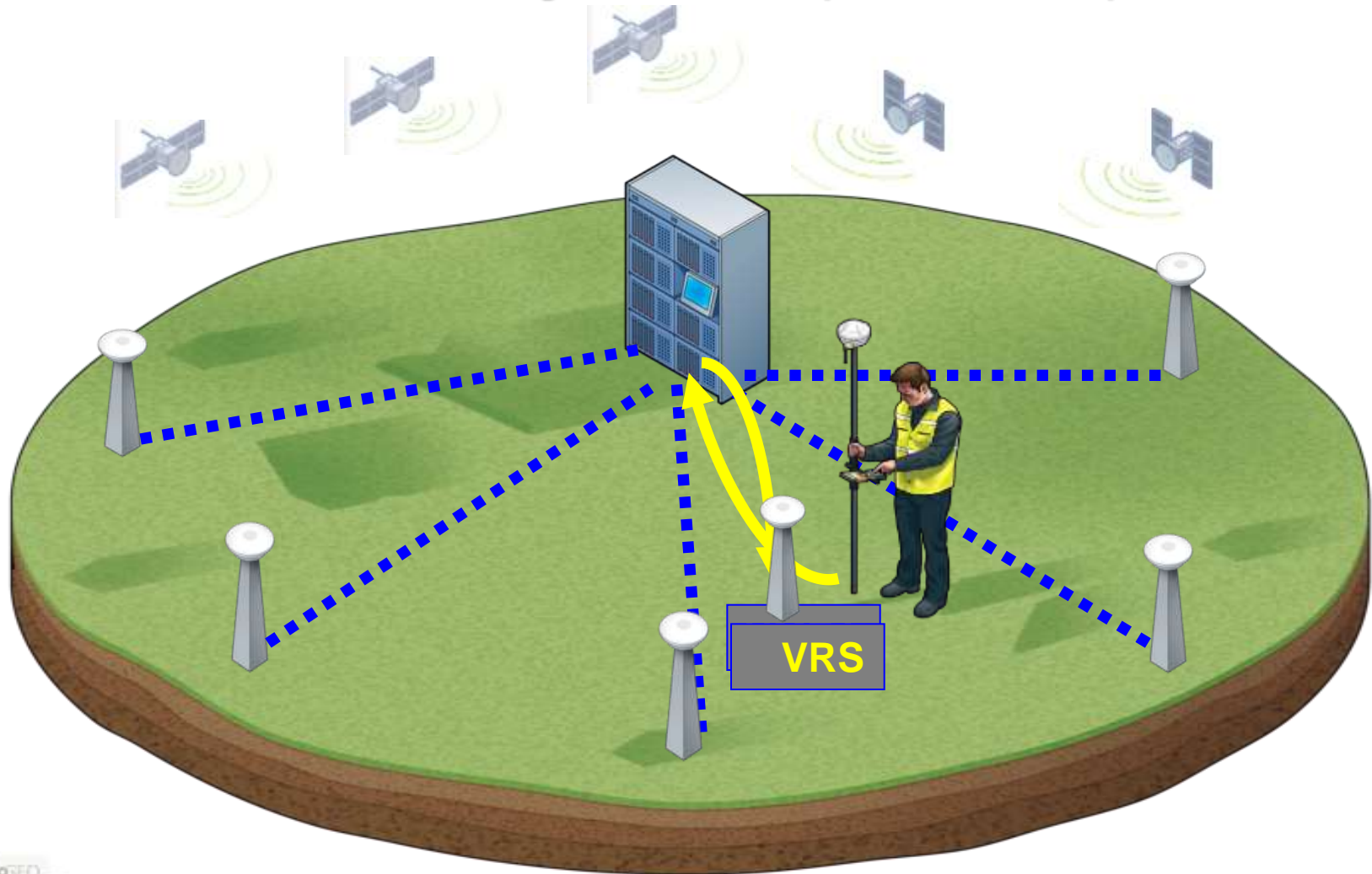
Atenção!

→ os dados de estações virtuais não são obtidos de um receptor real;

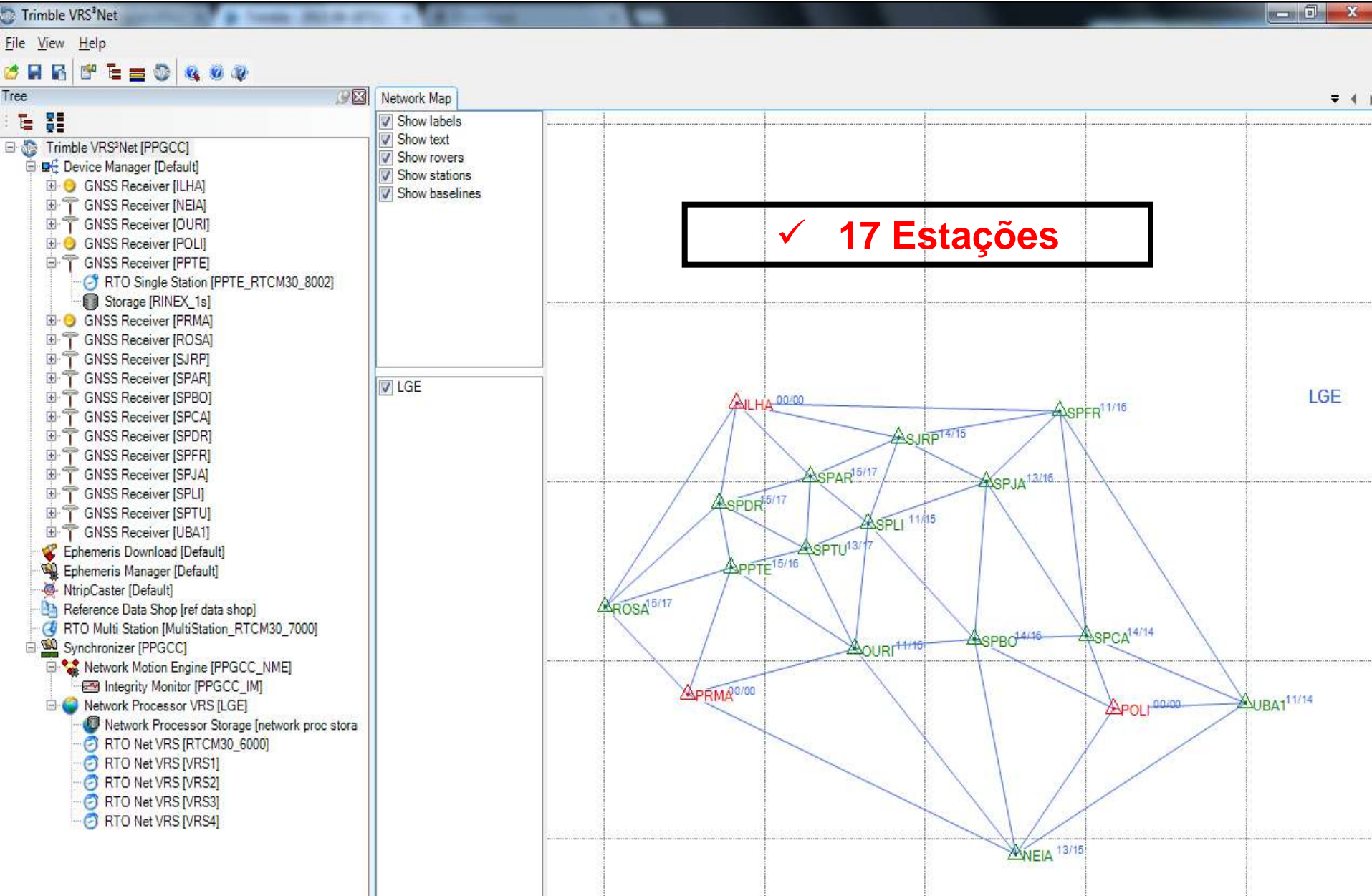
→ calculados de observações GNSS de estações de redes ativas;

Como Funciona?! RTK em Rede - VRS

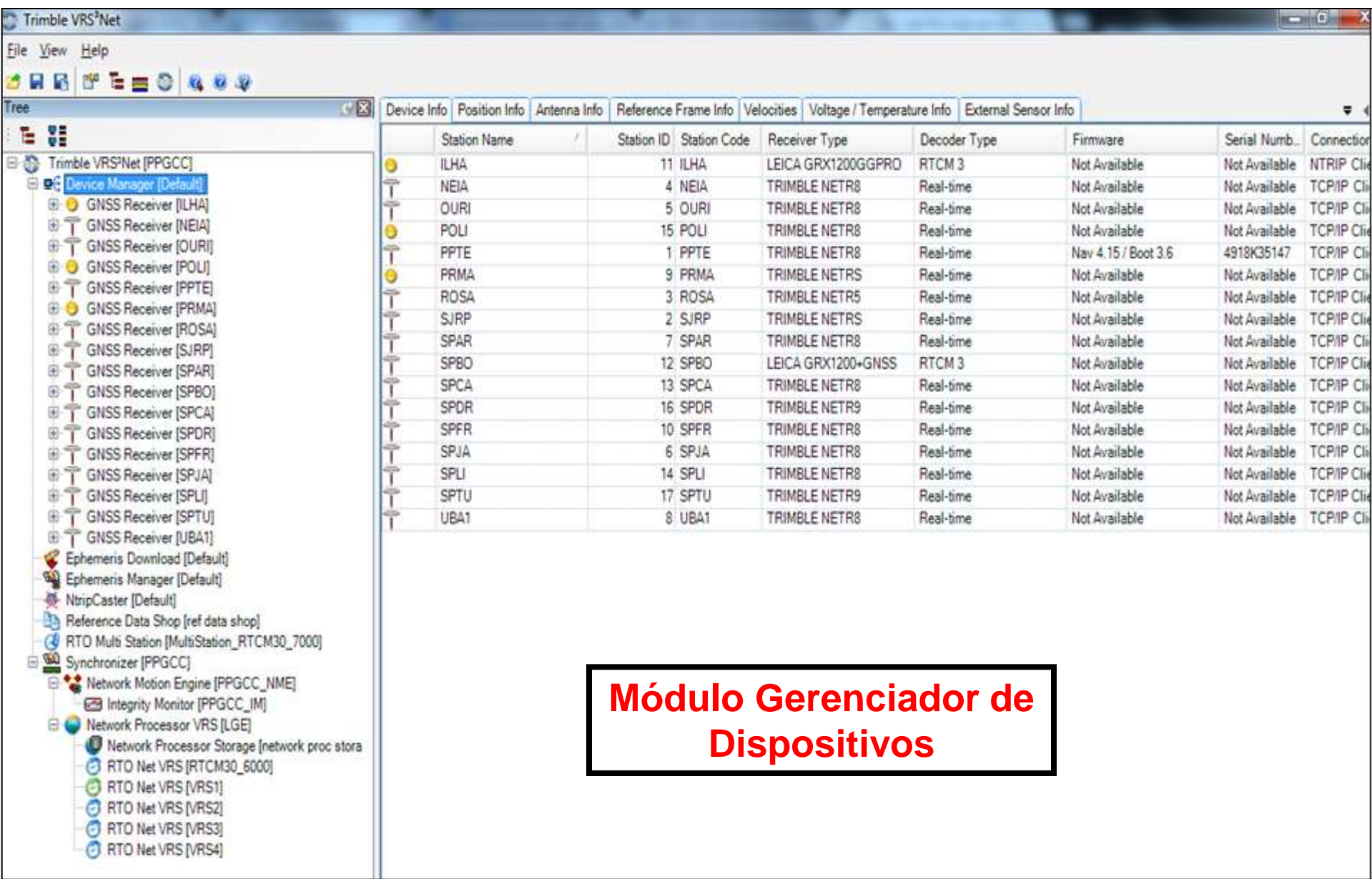
Receptor Rover envia suas posições ao Centro de Controle. Centro de Controle gera dados VRS para o receptor rover.



Trimble VRS³Net™



Trimble VRS³Net™



The screenshot displays the Trimble VRS²Net software interface. On the left is a 'Tree' view showing a hierarchical structure of components, including 'Device Manager [Default]' with a list of GNSS receivers (ILHA, NEIA, OURI, POLI, PPTE, PRMA, ROSA, SJRP, SPAR, SPBO, SPCA, SPDR, SPFR, SPJA, SPLI, SPTU, UBA1) and other modules like 'Ephemeris Download', 'NtripCaster', and 'Network Processor VRS'. The main area on the right is a table with tabs for 'Device Info', 'Position Info', 'Antenna Info', 'Reference Frame Info', 'Velocities', 'Voltage / Temperature Info', and 'External Sensor Info'. The 'Device Info' tab is active, showing a table of receiver details.

	Station Name	Station ID	Station Code	Receiver Type	Decoder Type	Firmware	Serial Num...	Connection
●	ILHA	11	ILHA	LEICA GRX1200GGPRO	RTCM 3	Not Available	Not Available	NTRIP Cli
⌵	NEIA	4	NEIA	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	OURI	5	OURI	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
●	POLI	15	POLI	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	PPTE	1	PPTE	TRIMBLE NETR8	Real-time	Nav 4.15 / Boot 3.6	4918K35147	TCP/IP Cli
●	PRMA	9	PRMA	TRIMBLE NETRS	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	ROSA	3	ROSA	TRIMBLE NETR5	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SJRP	2	SJRP	TRIMBLE NETRS	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPAR	7	SPAR	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPBO	12	SPBO	LEICA GRX1200+GNSS	RTCM 3	Not Available	Not Available	TCP/IP Cli
⌵	SPCA	13	SPCA	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPDR	16	SPDR	TRIMBLE NETR9	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPFR	10	SPFR	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPJA	6	SPJA	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPLI	14	SPLI	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	SPTU	17	SPTU	TRIMBLE NETR9	Real-time	Not Available	Not Available	TCP/IP Cli
⌵	UBA1	8	UBA1	TRIMBLE NETR8	Real-time	Not Available	Not Available	TCP/IP Cli

Módulo Gerenciador de Dispositivos

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Módulo Receptor GNSS

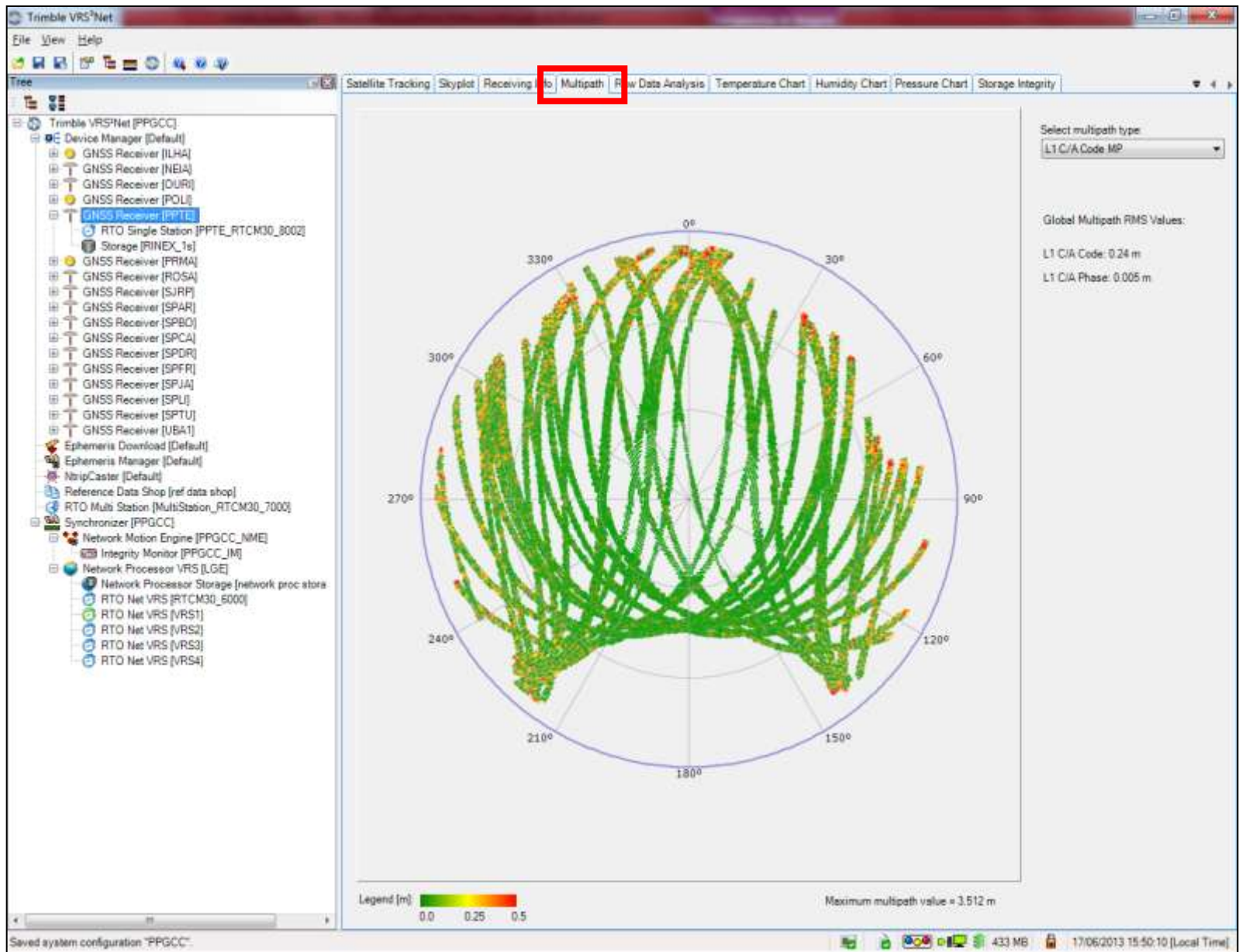
Trimble VRS³Net

File View Help

Tree

Satellite Tracking Skyplot Receiving Info Multipath Raw Data Analysis Temperature Chart Humidity Chart Pressure Chart Storage Integrity

Sat	El [°]	Az [°]	SNR (CA/P1/E1)	SNR (L2/L2C/L2CA)	CA/P1/E1	L2/L2C/L2CA
G03	0	73	-	-	-	-
G02	3	225	-	-	-	-
G09	4	309	-	-	-	-
G01	12	3 40	22 / 38	20431	20404 / 20431	
G10	17	219 42	24	1710	1710	
R09	18	325 45 / 42	39	1460 / 1458	1448	
G04	22	246 41	26	3270	3270	
R06	22	204 47 / 44	41	3153 / 3203	3154	
G16	26	119 44	28	5053	5053	
G08	28	310 46	31	2651	2460	
G32	30	53 42	30	23328	23328	
R04	33	65 47 / 46	42	22385 / 22385	22385	
G23	44	150 51	39	16304	16269	
G13	45	193 50	38	12396	12396	
R15	49	163 50 / 48	47	12486 / 12483	12486	
G07	56	287 51	44 / 49	7452	7346 / 7452	
R05	60	144 55 / 52	50	9998 / 10479	9998	
G20	62	50 52	44	18744	18744	
R16	69	302 52 / 50	50	7895 / 7895	7895	



Select multipath type
L1 C/A Code MP

Global Multipath RMS Values:
L1 C/A Code: 0.24 m
L1 C/A Phase: 0.005 m

Legend [m] 0.0 0.25 0.5

Maximum multipath value = 3.512 m

Trimble VRS³Net™

The screenshot shows the Trimble VRS³Net software interface. On the left is a tree view of the system configuration, including various GNSS receivers and network processors. The 'Ephemeris Download [Default]' item is highlighted with a red box. On the right is a log window with columns for Time [GPSTime], Download Type, and Action. The log shows a sequence of events from 18:00:21 to 22:03:47, including downloading precise files, orbit files, and DCB files. The status messages indicate when files are up to date, when downloads start, and when they are finished.

Time [GPSTime]	Download Type	Action
18/06/2013 18:00:21	Precise	Trimble Precise Download starts.
18/06/2013 18:00:21	Precise	Number of Precise files of interest found: 84
18/06/2013 18:00:21	Precise	Start downloading Precise files.
18/06/2013 18:01:10	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 18:01:12	Predicted	The file on the ftp server in Berne hasn't changed since the last check. Not necessary to download.
18/06/2013 18:01:14	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 18:31:07
18/06/2013 18:04:18	Precise	Finished downloading Precise files. Total number of downloaded Precise files: 2
18/06/2013 18:04:18	Precise	Start uncompressing Precise files.
18/06/2013 18:04:18	Precise	Uncompressed file: C:\ephemeris\igr17451.sp3.Z
18/06/2013 18:04:18	Precise	Uncompressed file: C:\ephemeris\igr17451.clk.Z
18/06/2013 18:04:18	Precise	Finished uncompressing Precise files. Total number of uncompressed Precise files: 2
18/06/2013 18:04:18	Precise	Precise files are all up to date. Next update will be at: 18/06/2013 19:00:00
18/06/2013 18:31:16	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 18:31:18	Predicted	The file on the ftp server in Berne hasn't changed since the last check. Not necessary to download.
18/06/2013 18:31:20	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 19:01:14
18/06/2013 19:01:22	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 19:01:25	Predicted	The file on the ftp server in Berne hasn't changed since the last check. Not necessary to download.
18/06/2013 19:01:27	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 19:31:20
18/06/2013 19:31:29	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 19:31:33	Predicted	Number of orbits files of interest found: 1
18/06/2013 19:31:33	Predicted	Start downloading orbit files.
18/06/2013 19:31:41	Predicted	Downloaded file: igu17452_18.sp3.Z
18/06/2013 19:31:41	Predicted	Finished downloading orbit files. Total number of downloaded orbit files: 1
18/06/2013 19:31:41	Predicted	Start uncompressing orbit files.
18/06/2013 19:31:41	Predicted	Finished uncompressing orbit files. Total number of uncompressed orbit files: 1
18/06/2013 19:31:41	Predicted	Start converting orbit files.
18/06/2013 19:31:41	Predicted	Converted file: ecf17452_18 orb
18/06/2013 19:31:41	Predicted	Finished converting files. Total number of converted files: 1
18/06/2013 19:31:43	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 21:00:00
18/06/2013 21:00:18	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 21:02:01	Predicted	Number of orbits files of interest found: 1
18/06/2013 21:02:01	Predicted	Start downloading orbit files.
18/06/2013 21:02:09	Predicted	Content of file igu17452_21 is equal to igu17452_18. igu17452_21 can get discarded.
18/06/2013 21:02:09	Predicted	Finished downloading orbit files. Total number of downloaded orbit files: 1
18/06/2013 21:02:11	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 21:30:16
18/06/2013 21:32:13	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 21:32:15	Predicted	The file on the ftp server in Berne hasn't changed since the last check. Not necessary to download.
18/06/2013 21:32:17	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 22:02:11
18/06/2013 22:00:24	DCB	DCB Download (from CODE) starts.
18/06/2013 22:00:24	Precise	Trimble Precise Download starts.
18/06/2013 22:00:24	DCB	DCB files are all up to date.
18/06/2013 22:00:24	DCB	DCB files are all up to date. Next update will be at: 18/06/2013 23:00:00
18/06/2013 22:00:24	Precise	Number of Precise files of interest found: 82
18/06/2013 22:00:24	Precise	Start downloading Precise files.
18/06/2013 22:02:19	Predicted	Looking for orbit files - connecting via FTP
18/06/2013 22:02:21	Predicted	The file on the ftp server in Berne hasn't changed since the last check. Not necessary to download.
18/06/2013 22:02:23	Predicted	Orbit files are all up to date. Next update will be at: 18/06/2013 22:32:17
18/06/2013 22:03:47	Precise	Finished downloading Precise files. Total number of downloaded Precise files: 0
18/06/2013 22:03:47	Precise	Precise files are all up to date. Next update will be at: 18/06/2013 23:00:00

**Módulo
Download
de Efemérides**

Trimble VRS³Net™

Módulo NtripCaster

This screenshot shows the Trimble VRS³Net interface with the 'Users' tab selected in the Status window. The 'Users' tab is highlighted with a red box. The table below displays the current user connection details.

Login	Connection Time	Mountpoint	Type (TCP/UDP)	Bytes Sent	Bytes Received	User Host	User Port
<Anonymous>	0d 01:03:27	VRS1	TCP	1192389	187	200.145.185.240	63897

This screenshot shows the Trimble VRS³Net interface with the 'Mountpoints' tab selected in the Status window. The 'Mountpoints' tab is highlighted with a red box. The table below displays the status of various mountpoints.

Mountpoint	Connection Type	Total Connections	To Primary	To Secondary	Mode	Connected	Primary / Secondary Source Ho
VRS_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
SPJA_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
SPBO_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
SPAR_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
POLI_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
PPTTE_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
PPTTE_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
SPTU_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
SPDR_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
SPCA_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
NEIA_RTCM30	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -
VRS4	Point to Point with CL	0	0	0	Single data source	To 1 source	200.145.185.240 / -

This screenshot shows the Trimble VRS³Net interface with the 'History' tab selected in the Status window. The 'History' tab is highlighted with a red box. The table below displays the connection history for the VRS1 mountpoint.

User Name	Connect Time (Local Time)	Disconnect Time (Local Ti...	Mountpoint	Bytes Sent	Bytes Received	User Host	User Port
<Anonymous>	2013-06-18 10:26:11	2013-06-18 10:26:31	VRS1	14	187	200.145.185.240	51962
<Anonymous>	2013-06-18 10:26:42	2013-06-18 10:27:02	VRS1	14	187	200.145.185.240	51972
<Anonymous>	2013-06-18 10:27:14	2013-06-18 10:27:34	VRS1	14	187	200.145.185.240	51988
<Anonymous>	2013-06-18 10:27:48	2013-06-18 10:31:20	VRS1	52280	187	200.145.185.240	52006
<Anonymous>	2013-06-18 10:31:30	2013-06-18 10:33:06	VRS1	20896	187	200.145.185.240	52133
<Anonymous>	2013-06-18 10:33:16	2013-06-18 11:15:51	VRS1	781715	187	200.145.185.240	52191
<Anonymous>	2013-06-18 11:16:01	2013-06-18 13:13:36	VRS1	2163360	187	200.145.185.240	55060
<Anonymous>	2013-06-18 13:13:46	2013-06-18 13:14:06	VRS1	14	187	200.145.185.240	58189
<Anonymous>	2013-06-18 13:14:17	2013-06-18 13:14:37	VRS1	14	187	200.145.185.240	58206
<Anonymous>	2013-06-18 13:14:49	2013-06-18 13:15:09	VRS1	14	187	200.145.185.240	58219
<Anonymous>	2013-06-18 13:15:23	2013-06-18 13:15:43	VRS1	14	187	200.145.185.240	58232
<Anonymous>	2013-06-18 13:16:01	2013-06-18 13:16:21	VRS1	14	187	200.145.185.240	58248
<Anonymous>	2013-06-18 13:16:47	2013-06-18 13:17:07	VRS1	14	187	200.145.185.240	58270

Trimble VRS³Net™

Módulo de Sincronização

The screenshot displays the Trimble VRS³Net software interface. On the left is a tree view showing the system configuration, including a 'Synchronizer [PPGCC]' and several 'RTO Net VRS' stations. The main window shows a 'Station Delay' tab with a table of receiver data. Summary statistics at the top right indicate a last hour delay of 1010 ms and an average delay of 296 ms. The table below lists 20 receivers with columns for Source, Station Name, Station Code, Received, Used Epochs, Too Late Epochs, Received [GPS Time], Max. Delay [ms], and Average Delay [ms].

Source	Station Name	Station Code	Received	Used Epochs	Too Late Epochs	Received [GPS Time]	Max. Delay [ms]	Average Delay [ms]
GNSS Receiver.ILHA	ILHA	ILHA	18438	18421	17	18/06/2013 22:56:57	12453	960
GNSS Receiver.NEIA	NEIA	NEIA	128323	128243	80	18/06/2013 22:56:57	12782	73
GNSS Receiver.OURI	OURI	OURI	128323	128323	0	18/06/2013 22:56:57	1279	37
GNSS Receiver.POLI	POLI	POLI	142	136	6	18/06/2013 18:32:12	---	---
GNSS Receiver.PPTE	PPTE	PPTE	128321	128321	0	18/06/2013 22:56:57	1042	37
GNSS Receiver.PRMA	PRMA	PRMA	0	0	0	---	---	---
GNSS Receiver.ROSA	ROSA	ROSA	128323	128323	0	18/06/2013 22:56:57	361	45
GNSS Receiver.SJRP	SJRP	SJRP	128323	128323	0	18/06/2013 22:56:57	1465	27
GNSS Receiver.SPAR	SPAR	SPAR	128323	128323	0	18/06/2013 22:56:57	1064	35
GNSS Receiver.SPBO	SPBO	SPBO	125158	124561	597	18/06/2013 22:56:57	54723	106
GNSS Receiver.SPCA	SPCA	SPCA	127469	127431	38	18/06/2013 22:56:57	6069	13
GNSS Receiver.SPDR	SPDR	SPDR	128321	128287	34	18/06/2013 22:56:57	28221	15
GNSS Receiver.SPFR	SPFR	SPFR	128323	128323	0	18/06/2013 22:56:57	1263	46
GNSS Receiver.SPJA	SPJA	SPJA	128055	128045	10	18/06/2013 22:56:57	2434	94
GNSS Receiver.SPLI	SPLI	SPLI	128323	128317	6	18/06/2013 22:56:57	6052	24
GNSS Receiver.SPTU	SPTU	SPTU	128323	128323	0	18/06/2013 22:56:57	334	6
GNSS Receiver.UBA1	UBA1	UBA1	128297	128143	154	18/06/2013 22:56:57	59278	50

Trimble VRS³Net™

Módulo Monitoramento da Rede

The screenshot displays the Trimble VRS³Net software interface. On the left is a tree view showing the system configuration, including various GNSS receivers, storage, and network components. On the right is a 'Status' table providing real-time data for 17 stations.

Status	Station ID /	Station Code	Station Name	Time Processed	Last Update	Δ Northing [m]	Δ Easting [m]	Δ Height [m]	Δ 2D	Δ 3D
▲	1	PPTE (reference)	PPTE	40.13:18:15	18/06/2013 22:59:...	0.000	0.000	0.000	0.000	0.000
●	2	SJRP	SJRP	40.12:51:45	18/06/2013 22:59:...	0.000	-0.001	0.016	0.001	0.016
●	3	ROSA	ROSA	14.12:11:45	18/06/2013 22:59:...	-0.013	0.003	0.011	0.014	0.018
●	4	NEIA	NEIA	27.01:43:30	18/06/2013 22:59:...	-0.007	0.007	-0.012	0.010	0.015
●	5	OURI	OURI	14.07:25:00	18/06/2013 22:59:...	-0.006	0.000	-0.022	0.006	0.023
●	6	SPJA	SPJA	40.11:34:45	18/06/2013 22:59:...	0.002	0.002	-0.002	0.003	0.003
●	7	SPAR	SPAR	6.01:28:00	18/06/2013 22:59:...	-0.021	-0.058	-0.040	0.061	0.073
●	8	UBA1	UBA1	39.22:14:00	18/06/2013 22:59:...	-0.006	0.006	-0.050	0.008	0.051
●	9	PRMA	PRMA	8.20:52:00						
●	10	SPFR	SPFR	10:44:30	18/06/2013 22:59:...	-0.030	-0.012	0.030	0.032	0.044
●	11	ILHA	ILHA	05:04:15	18/06/2013 22:59:...	-0.001	0.012	0.004	0.012	0.013
●	12	SPBO	SPBO	1.03:08:15	18/06/2013 22:59:...	-0.005	0.011	-0.008	0.012	0.014
●	13	SPCA	SPCA	24.15:15:30	18/06/2013 22:59:...	-0.026	-0.065	-0.060	0.070	0.092
●	14	SPLI	SPLI	10:35:45	18/06/2013 22:59:...	2.008	-0.774	-1.941	2.152	2.898
●	15	POLI	POLI	00:00:00						
●	16	SPDR	SPDR	5.03:23:30	18/06/2013 22:59:...	1.214	-0.546	-1.741	1.331	2.192
●	17	SPTU	SPTU	10:27:30	18/06/2013 22:59:...	-0.015	-0.012	0.020	0.019	0.028

Trimble VRS³Net™

The screenshot displays the Trimble VRS³Net software interface. On the left is a tree view of the network configuration, including receivers, storage, and network processor components. The main window shows a 'Status' tab with a table of station performance data. A red box highlights the 'Status' tab label. A yellow box highlights the 'Network performance 24h / 1h [%]' values, which are 92.98 and 95.41 respectively. A black box with red text is overlaid on the bottom right, reading 'Módulo Processamento da Rede'.

Epoch [GPS Time]: 18/06/2013 23:12:42 Time since last initialization: 1d 11:54:05 Network performance 24h / 1h [%]: 92.98 95.41

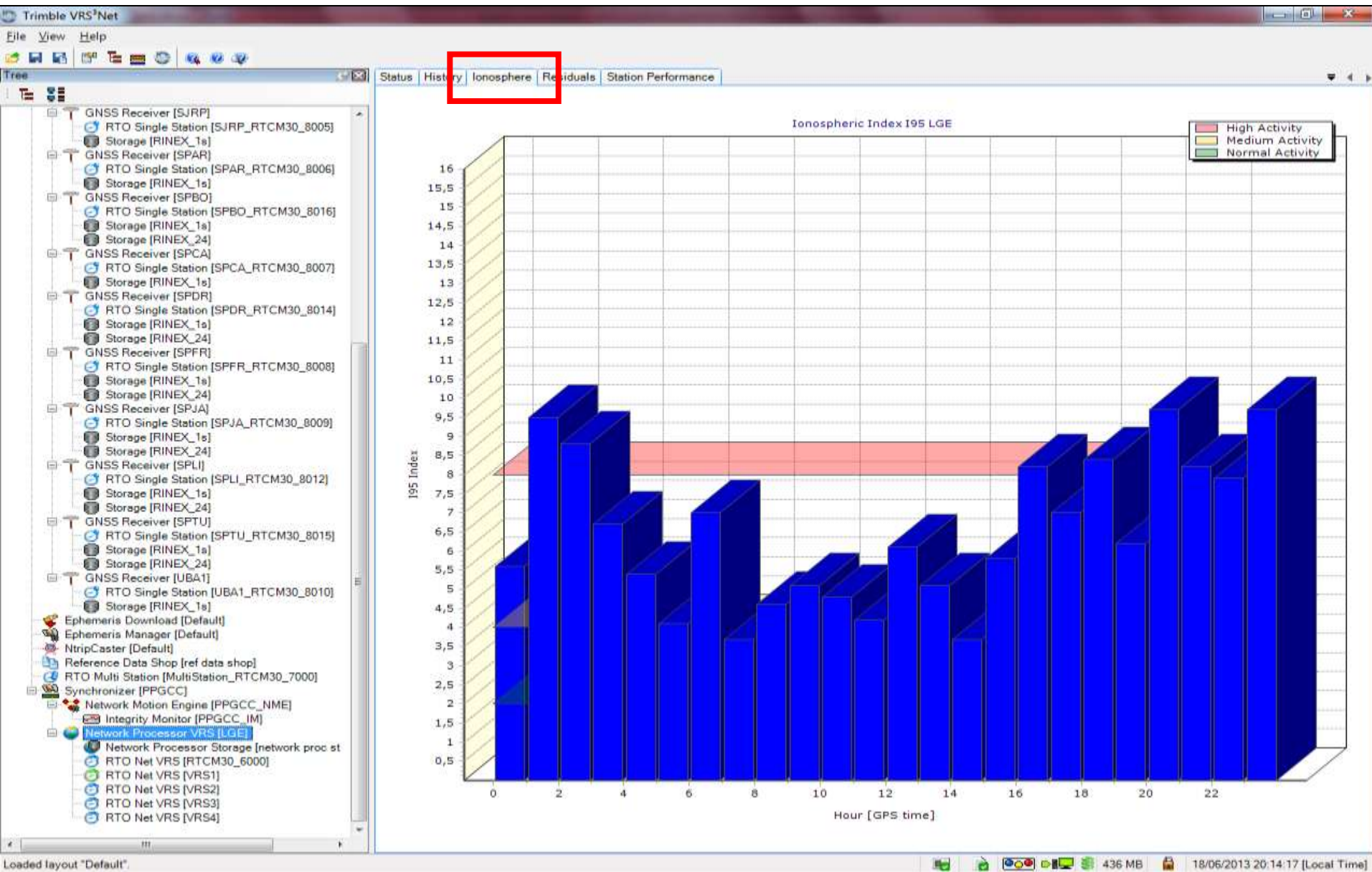
Date of DCB files: 05/2013

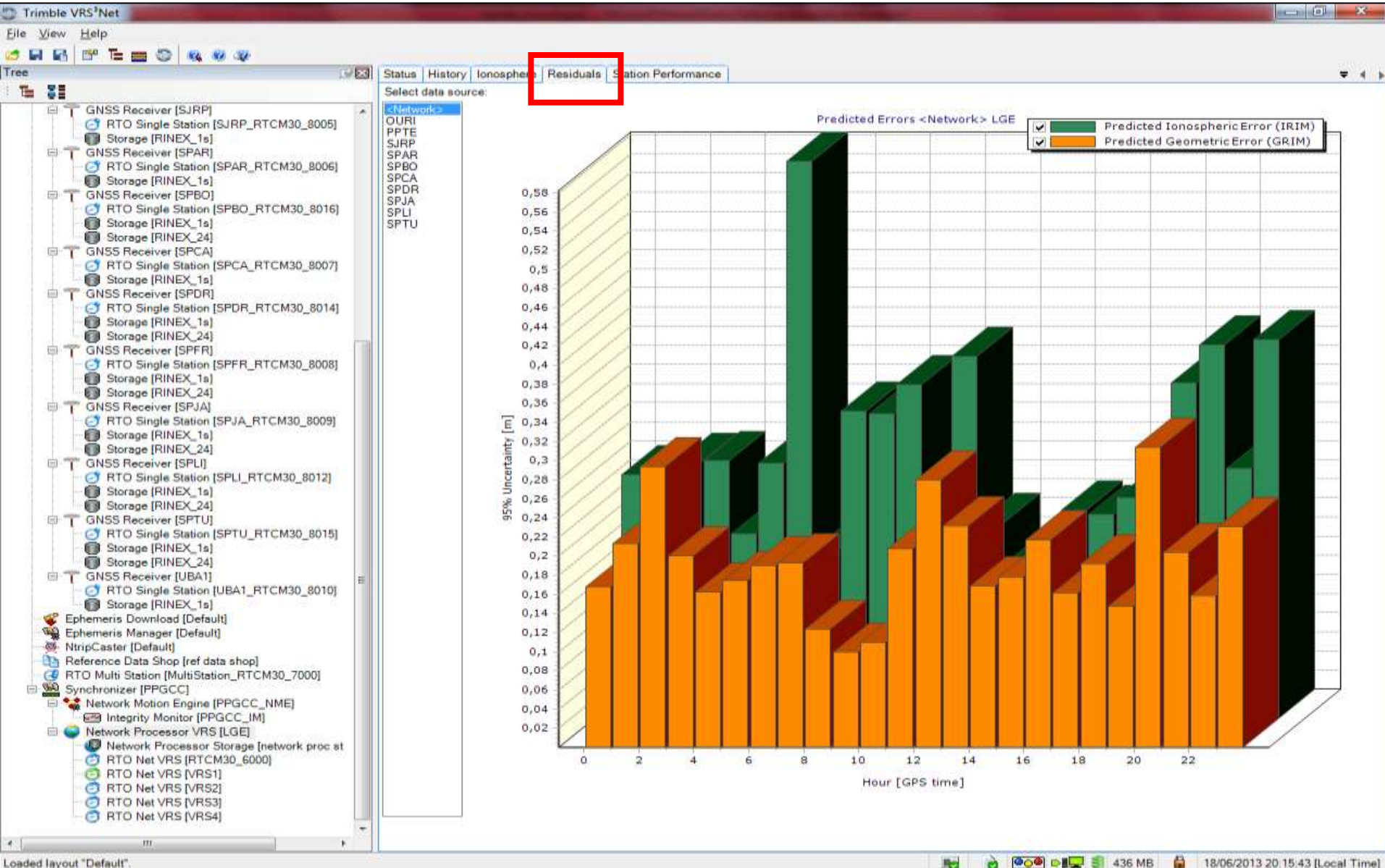
	Station Name	Station Code	Tracked	Processed	Solved	24h Performance [%]	1h Performance [%]	Not Solved Satellites
●	ILHA	ILHA	19	17	16	90.24	97.06	G02[E] G03[E] G28[N]
●	NEIA	NEIA	18	16	10	92.60	91.49	G02[E] G03[E] R04[N]
●	OURI	OURI	17	15	15	93.63	96.37	G02[E] G07[B]
●	PPTE	PPTE	19	15	15	90.78	97.38	G02[E] G03[E] G28[E]
●	PRMA	PRMA	0	0	0	0.00	0.00	
●	ROSA	ROSA	18	17	12	92.96	93.28	G02[N] G28[E] R05[N]
●	SJRP	SJRP	19	16	16	93.94	96.05	G02[E] G03[E] G28[E]
●	SPAR	SPAR	19	16	16	94.37	96.66	G02[E] G03[E] G28[E]
●	SPCA	SPCA	16	16	16	94.24	96.35	
●	SPFR	SPFR	19	15	14	92.32	96.20	G02[E] G03[E] G07[B]
●	SPJA	SPJA	19	16	16	93.93	98.01	G02[E] G03[E] G28[B]
●	SPLI	SPLI	0	0	0	75.43	100.00	
●	UBA1	UBA1	15	15	13	92.40	90.70	G03[N] R09[N]
●	POLI	POLI	0	0	0	0.00	0.00	
●	SPDR	SPDR	19	16	16	92.45	96.69	G02[E] G03[E] G28[E]
●	SPTU	SPTU	19	16	15	93.48	90.88	G02[E] G03[E] G28[E]
●	SPBO	SPBO	18	16	16	93.11	96.17	G02[E] G03[E]

Loaded layout "Default".

436 MB 18/06/2013 20:12:26 [Local Time]

**Módulo
Processamento
da Rede**





Trimble VRS³Net™

The screenshot displays the Trimble VRS³Net software interface. On the left, a tree view lists various components including GNSS Receivers, RTO Single Stations, and Storage units for multiple stations (e.g., SJRP, SPAR, SPBD, SPCA, SPDR, SPFR, SPJA, SPLI, SPTU, UBA1). The 'Network Processor VRS [LGE]' component is expanded, showing 'Network Processor Storage [network proc storage]' selected. The right panel shows the properties for this storage component.

File properties:

Current file:	C:\processor storage\RefData.13\Month.Jun\Day.18\LGE_169X.npr
Current size:	10.114 MB
Current timespan:	18/06/2013 23:00:00 -> 23:17:39 <- 23:59:59
Written epochs:	1060
Missing epochs:	0
Maximum gap:	0
Status:	1060/3600

Disk properties:

Destination:	Ige-pc C:\processor storage
Total disk size:	976.465 GB
Used disk space:	327.105 GB
Available free disk space:	649.360 GB (67%)

**Módulo
de
Armazenamento**

Trimble VRS³Net

File View Help

Tree

Connections (1) Positions Observation Output Net Corrections Rover Status Connection History Status History

Connection	Login	Epochs Sent	Total Bytes Sent	Total Bytes Received	Bytes/sec Sent	Bytes/sec Received	Online Status
200.145.185.240:63898	anonymous	6084	1884430	72	267	0	Online - sending

Trimble VRS³Net

File View Help

Tree

Connections (1) Positions Observation Output Net Corrections Rover Status Connection History Status History

MEA Position [m m m]	RTO Position [m m m]	Ref Station Code	Physical Base Station	Distance to Reference Station [m]	Work Mode
-2352988.4008 (fixed)	3707078.1230 -4622689.8793 -2352988.4008	PPTE	PPTE	39123.020	VRS

Trimble VRS³Net

File View Help

Tree

Connections (1) Positions Observation Output Net Corrections Rover Status Connection History Status History

Connection	Login	Output Time [GPS Time]	Delay [sec]	Ref Station Code	# Sat	GPS Satellites	GLN Satellites
200.145.185.240...	anonymous	18/06/2013 23:23:41	0.1	PPTE	5	G07, G13, G16, G23	R05

Trimble VRS³Net

File View Help

Tree

Connections (1) Positions Observation Output Net Corrections Rover Status Connection History Status History

Connection	Login	Net Correction Time [GPS Time]	Net Correction Status	Sats - OK	Sats - Bad Geometry	Sats - Large Interpolation
200.145.185.240...	anonymous	18/06/2013 23:23:54	Net corrections applied	G07, G13, G16, G23...		

Trimble VRS³Net

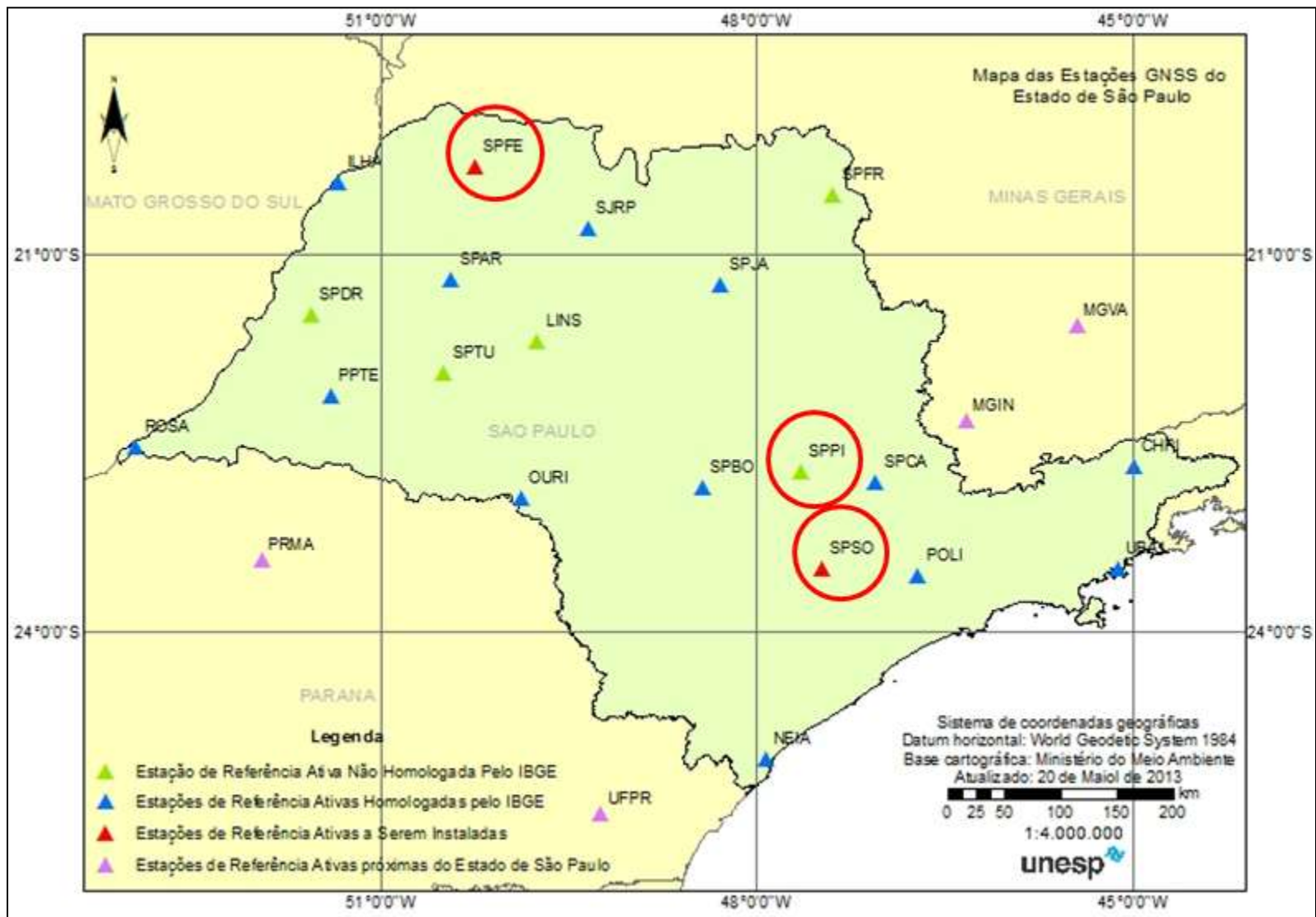
File View Help

Tree

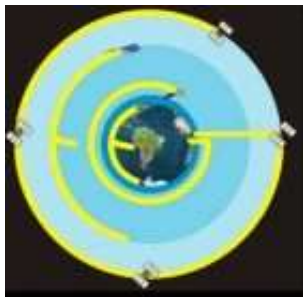
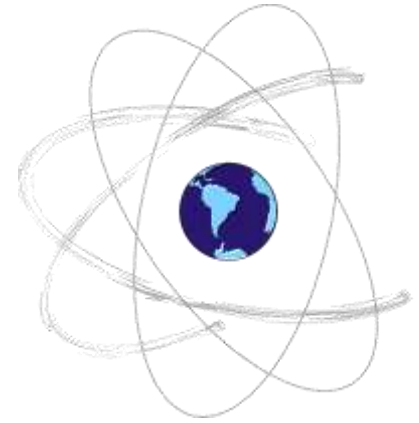
Connections (1) Positions Observation Output Net Corrections Rover Status Connection History Status History

Connection	Login	Time [UTC Time]	Latitude [°]	Longitude [°]	Height [m]	# Sat	HDOP	Solution
200.145.185.240...	anonymous	18/06/2013 21:41:43	0.000000	0.000000	110.000	5	1.0	Single point

Próximas Etapas



Agradecimentos



Obrigada pela atenção!

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