



מדינת ישראל - משרד הבינוי והשיכון

צוות התמיכה של מערך תחנות הקבע פרויקט CORS

18/Sept/2022 - Version 1

This document presents the usage of the RINEX store for the Israeli CORS Porject.

For any other assistance please contact us on: +972-3-6231-697 / apn@mapi.gov.il

Site is under the domain: mapigps.co.il



Site enables 2 main services:

- 1. <u>RINeX store</u>
- 2. Autmated processing of Observation files (RINeX 2.11 only)





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1. <u>RINeX Store</u>

Pressing the "GEO++ GPPWEB" title / image will load the GPPWEB application for RINeX store. On that site a username + password login is required (these are obtained only after completing a full registration at the CORS project signup process).

> c	88 🔺 mag	pigps.co.il/gppweb/rinex	
		Geo++*	
		Geo++*	
	User/Email	Geo++*	
	User/Email Password	Geo++*	

After login, a notification with a welcome message is popped, close it (Press OK). On the right upper side of the site the login username will be shown.

		🔊 Signal 🛛 🖄 Data format 🖉 🖷 Cart
S	tations (23)	RINEX VISUA BINEX A.
0	Ante	* * * * 25 May 2020 * * * * Hello All,
0	Addepter	
0	Ded - Porton	Welcome to the Surevy Of Israel
0	Cenama	RINEX & Virtual Reference Station program.
0	Cent lies	Please contact us to open your personal Account User &
0	Dringer	Password.
0	EW.	Omer Bar 03-6231697.
0	Eren.	ox All
0	Hata .	
0	(married and the second s	
0	Areaser .	Fortal Informer states
0	K-Duiter.	
0	Katal I	
0	Kalesen	
0	Katerr - Dismon	
0	Kostz Lahav	
0	Mene	
0	Mittye Ramon	
0	Name Hart	
0	None	
0	Dept 1	







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Important notice: for the entire pages of the RINeX

store buttons marked with blue color are the ones selected (or "pressed").

There are 2 sections for the RINeX store, they each have a specific section for full usage: (a) <u>Virtual RINeX Files Section</u> and (b) <u>Physical Sites Files Section</u>. Press any of the links to jump to the proper needed section.

I. Download Virtual Reference Station RINeX (VRX):

1. Creation and Downloading the desired files is split into 5 stages in 5 internal tabs:



Station tab – to select Physical site/s –or- Virtual site

Time tab – to select proper time for the files

Signal tab - to select the desired signals output

Data format tab – for selecting observation format, file extension and filename convention

Cart tab – to complete the purchase and download the files when process ends

2. On Station tab, at the top right of the screen there is an option button (three horizontal lines), enable the coordinate panel by clicking "Coordinate Panel -> LLA"









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3. at screen bottom the latitude-longitudealtitude panel is now visible



Current position is of the pin shown on screen.

- 4. Proper location for the VRX needs to be typed in preferably with rounding of the arc-seconds as in the example above (same for height). This will assist you to check the location is correct after loading the VRX files to a GNSS Processing software.
- 5. After pressing the OK button, the pin will move to the typed-in position. Nonetheless, the position can be selected with a double-click on the map (zooming in can assist in selecting the proper location).
- 6. Move to the Time tab. In this tab time frame of the VRX is selected.

Station	e period 🔊 Signal 📳 🛛	Data format 📔 Cart	
	Timevalue:	Timezone GPS-time	
	Timezone:	UTC+03.00	•
	Timeformat:	12 hours 24 hours	
	Observation chooser:	End Duration	
Sta	rt of observation time:	12:00 AM	•
Sta	rt of observation date:	May 25, 2020	*
En	d of observation time:	1:00 AM	•
Er	nd of observation date:	May 25, 2020	
Obs	ervation interval [sec]:	5.0	•
Sele	ected time period from:	2020-05-25-00:00 UTC+03.00	(GPS-week: 2107, GPS-doy: 75600.0)
5	elected time period to:	2020-05-25-01:00 UTC+03.00	(GPS-week: 2107, GPS-doy: 79200.0)
	leap seconds:	18 seconds will not be used for calculation from/to UTC	

- 7. You may choose between local-time and GPS-time.
- 8. After selecting the start-date, start-time, end-date, end-time and sample interval.







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- 9. Take notice that the minimal time-interval is 1sec (1 Hz).
- 10. You can select duration from the start-timing instead of an end-timing.
- 11. On the Signal tab you may choose which Satellite-systems and codes (measurement types) will appear in the VRX RINEX observation file.

	me period Signal	🖺 Data format 🛛 🃜 Cart
GPS	Off On	
		Frequency Band / frequency GPS
	Pseudorange C1:	Off On
	Pseudorange C2:	Off On
	Carrier Phase L1:	Off On
	Carrier Phase L2:	Off On
	Doppler:	Off On
		GNSS System GLONASS
GLONASS	Off On	,

- 12. By default, all fields are marked to be exported to the VRX RINeX observation files. For computations of trajectories (which contains movement of the GNSS receivers – and not static measurements) Doppler is advised to be set to export to the files – this does not change any fees.
- 13. At bottom, you may choose if GLONASS satellites are included or not.

	Navigation file:	Off On Session files	Day files	Hour files	ı	
Compact	Data splitting: RINEX (Hatanaka):	Off On	Day files	Hour lifes	J	
	compressed RINEX:	Off On)			
	RINEX file suffix:	*.nxo, *.nxn	*.20o, *.20n,			
						_
						1

14. On the Data Format tab, you need to select the format of the exported files.





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- 15. It is recommended to export navigational files.
- 16. Data splitting into files is enables in three forms hourly files, daily files or session files select depending on the GNSS processing software you are using needs.
- 17. Exported RINeX files can be compacted via HTANAKA Compression format or just written regularly. All files will be in <u>RINeX version 2.11</u>.
- 18. For any of you running Scientific GNSS processing software it is recommended to select daily files.
- 19. On the right of the screen there is an "add to cart" button:
- 20. The following screen will let you see all setup information for the desired VRX as you typed it in.

	projectname:	test2505		
mpact i	• Station			
>	🝵 Time period			
	signal			
>	🗈 Data format			
				5
				1
	order		cancel	

- 21. Give a name to you project, no spaces are allowed here.
- 22. After checking the preferences to the VRX creation process press order to start processing the VRX files.







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23. At the Cart tab you can view current (and past) projects.

projectname	VRx	Order date	Available	Order state	Download	Delete
test2505	×	2020-05-25	🖌 100 %	Shop now		×
		2020-05-07	×	×	*	×
		2020-05-04	×	×	*	×
			×	×		
			×	×		

- 24. At this example VRX field is marked with a green V marker, and there are 100% of the data available.
- 25. After pressing the "Order now" button you need to accept the fees and agree VRX **RINeX** file creation.
- 26. After pressing OK/YES the server will start producing the VRX RINeX files as long there is a hot coffee mug at the "order state" column server is still processing the request, when all data is read a green V marker will show up.

projectname	VRx	Order date	Available	Order state	Download	Delete
test2505	 Image: A second s	2020-05-25	🧹 100 %	1		×
ma57		2020-05-07	×	×	*	×
test100		2020-05-04	×	×	*	×
vrxnew		2020-04-26	×	1	*	×

27. Press the 🎽 button to download the files.

projectname	VRx	Order date	Available	Order state	Download	Delete
test2505	×	2020-05-25	🖌 100 %	×	*	×
ma57		2020-05-07	×	×	*	×
test100		2020-05-04	×	×	*	×
vrxnew		2020-04-26	×	1	*	×





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28. At the pop-up window, click again the computer you are working with.

button to download the files to the local

	VRx	Order date	Available	Order state	
Name		Туре		Size	
test2505	zip	.zip		422 KB	
action		send to email addr	ress	send	
Delete				×	
downloa	d			*	
			cel		

Files will be downloaded automatically to the folder you set at the browser settings for default download directory – or the browser will ask for a specific location to save the files.



29. RINeX Files within the ZIP file downloaded are seen as:



SURVEY OF ISRAEL המרכז למיפוי ישראל גאודזיה, קדסטר, הידרוגרפיה, מיפוי וממ"ג Geodesy, Cadastre, Hydrography, Mapping and GIS CORS support Team צוות התמיכה של מערך תחנות הקבע מדינת ישראל - משרד הבינוי והשיכון CORS Project CORS פרויקט Name Type Co test145v.lrx LRX File test145v.rxg **RXG** File test145v.rxn **RXN File** test145v.rxo **RXO** File

RINeX files will be named using the 4 initial letters of the project name you typed in. the different file types are:

.LRX file – textual file to sum all the data in the RINeX files.

.RXO / .220 – RINeX Observation file – version 2.11

.RXN / .22n - RINeX navigation file for GPS SVs - version 2.11

.RXG / .22g - RINeX navigation file for GLONASS SVs - version 2.11

II. <u>RINeX files of physical sites:</u>

1. Downloading the desired files of physical sites is split into 5 stages in 5 internal tabs:

<u>.</u>				
9 Station	🛗 Time period	🔊 Signal	🖪 Data format	🃜 🔚 Cart
Statio	ns (23) «	RIN	EX virtual RI	NEX

Station tab - to select Physical site/s -or- Virtual site

Time tab – to select proper time for the files

Signal tab - to select the desired signals output

Data format tab – for selecting observation format, file extension and filename convention

Cart tab - to complete the purchase and download the files when process ends



2. At Station Tab - RINEX button need to be pressed/selected (displayed in blue color)

S	Stations (23)	~	RINEX	virtual RINEX	
0	Ariel	_			
0	Ashkelon				

 Selecting sites can be by clicking on their names, please see that there might be more than 1 page for the sites names (depending on the bowsers zoom ratio). To select all sites with a single click – there is a hidden button just under "Stations" header – circled in brown.



4. Move to the Time tab. In this tab time frame for the desired RINeX files.

Station	🖀 Time period 🔊 Signal 🖪 🛙	Data format 🛛 📜 Cart	
	Timevalue:	Timezone GPS-time	C
	Timezone:	UTC+03.00	•
	Timeformat:	12 hours 24 hours	•
	Observation chooser:	End Duration	
	Start of observation time:	12:00 AM	0
	Start of observation date:	May 25, 2020	m
	End of observation time:	1:00 AM	•
	End of observation date:	May 25, 2020	
	Observation interval [sec]:	5.0	0
	Selected time period from:	2020-05-25-00:00 UTC+03.00	(GPS-week: 2107, GPS-doy 75600.0)
	Selected time period to:	2020-05-25-01:00 UTC+03.00	(GPS-week: 2107, GPS-doy 79200.0)
	leap seconds:	<i>18 seconds will not be used for calculation from/to UTC</i>	
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- 5. You may choose between local-time and GPS-time.
- 6. After selecting the start-date, start-time, end-date, end-time and sample interval.
- 7. Take notice that the minimal time-interval is 1sec (1 Hz).
- 8. You can select duration from the start-timing instead of an end-timing.
- 9. On the Signal tab you may choose which Satellite-systems and codes (measurement types) will appear in the downloaded RINeX observation file.

GPS	Off On	▼ GNSS System GPS
		← Frequency Band / frequency GPS
Ps	eudorange C1:	Off On
Ps	eudorange C2:	Off On
Ca	nrrier Phase L1:	Off On
Ca	nrrier Phase L2:	Off On
	Doppler:	Off On
		GNSS System GLONASS

- 10. By default, all fields are marked to be exported to the sites RINeX observation files. For computations of trajectories (which contains movement of the GNSS receivers and not static measurements) Doppler is advised to be set to export to the files this does not change any fees.
- 11. At bottom, you may choose if GLONASS satellites are included or not.
- 12. On the Data Format tab, you need to select the format of the exported files.

🛿 Station 📗 🎬 Time period 📗 🔊 Signal 📗 🗎 🗅	ata format 📑 Cart	
RINEX Version:	RINEX Version 2.x	
Navigation file:	Off On	
Data splitting:	Session files Day files Hour files	
Compact RINEX (Hatanaka):	Off On	
compressed RINEX:	Off On	
RINEX file suffix:	*.rxo, *.rxn *.20o, *.20n,	
		22
		ä





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- 13. It is recommended to export navigational files.
- 14. Data splitting into files is enables in three forms hourly files, daily files or session files select depending on the GNSS processing software you are using needs.
- 15. Exported RINeX files can be compacted via HTANAKA Compression format or just written regularly. All files will be in RINeX version 2.11.
- 16. For any of you running Scientific GNSS processing software it is recommended to select daily files.
- 17. On the right of the screen there is an "add to cart" button:
- 18. The following screen will let you see all setup information for the sites selected. within the Station section you can see the availability of the data at the server.

	projectname:	nzrt_may25		
ct RI	Station			
con > t	Time period			
> 1	Signal			
>1	🗈 Data format			
				3
	order		cancel	

- 19. Give a name to you project, no spaces are allowed here.
- 20. After checking the preferences to the RINeX creation process press order to start processing the VRX files.

21.

22. At the Cart tab you can view current (and past) projects.

projectname	VRx	Order date	Available	Order state	Download	Delete
1 nzrt_may25		2020-05-25	🖌 100 %	Shop now		×
1 test2505	×	2020-05-25	🖌 100 %	×	±.	×
		2020-05-07	×	1 A A A A A A A A A A A A A A A A A A A	±.	×
0		2020-05-04	×	1 A A A A A A A A A A A A A A A A A A A	*	×
		2020-04-26	×	1 A A A A A A A A A A A A A A A A A A A	±.	×





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- 23. After pressing the "Shop now" button you need to accept the fees and agree VRX RINeX file creation.
- 24. After pressing OK/YES the server will start producing the VRX RINeX files as long there is a hot coffee mug at the "order state" column server is still processing the request, when all data is read a green V marker will show up.

projectname	VRx	Order date	Available	Order state	Download	Delete
nzrt_may25		2020-05-25	🖌 100 %	4		×
test2505	×	2020-05-25	🖌 100 %	×	*	×
e algebili		2020-05-07	×	×	*	×
		2020-05-04	×	×	*	×
- Simo		2020-04-26	×		*	×

25.

- 26. Once the order is ready a green marker will appear at the Order Satays column
- 27. Press the 🎽 button to download the files

projectname	VRx	Order date	Available	Order state	Download	Delete
nzrt_may25		2020-05-25	🖌 100 %	~	<u>*</u>	×
test2505	×	2020-05-25	🖌 100 %	×	*	×
		2020-05-07	×	×	<u>*</u>	×
		2020-05-04	×		÷	×

28. At the pop-up window, click again the local computer you are working with.

button to download the files to the

DL Order date Available Order state VRx Ł Size Name Type Ł nzrt_may25.zip 529 KB zip Ł action send to email address send Ł Delete × download ÷ cancel





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Files will be downloaded automatically to

the folder you set at the browser settings for default download directory – or the browser will ask for a specific location to save the files.



29. RINeX Files within the ZIP file downloaded are seen as:

nzrt145v.lrx	LRX File
nzrt145v.rxg	RXG File
nzrt145v.rxn	RXN File
nzrt145v.rxo	RXO File

RINeX files will be named using the 4 letters of each physical site. the different file types are: .LRX file – textual file to sum all the data in the RINeX files.

.RXO / .220 – RINeX Observation file – version 2.11

.RXN / .22n – RINeX navigation file for GPS SVs – version 2.11

.RXG / .22g – RINeX navigation file for GLONASS SVs – version 2.11





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2. Autmated processing of Observation files

This module can only process <u>RINeX v2.11 files</u>. Only Observation files are needed.

a) Login into the service is via username and password allocated to you after the enrollment process is over.

	\bigcirc	
	Geo++®	
SSRP	OST servi	ce
User/Email		
Password		
	Login	

- b) Each point is processed individually, so for multiple solutions for same point several projects are needed.
- c) Opening a project follows next steps: (i) naming the project (no spaces are allowed, and only English chracters), (ii) pressing the "plus" button right of the name field.

≡				tst_0525		+ @			₽
My projects	Projects ~ T ~ t	tst0525							
, My Settings Projects		ආ	×			1	쓰	00	*
- tst0525	project			profile	date (project creation)	upload	analyse	processin	action

d) To process of the data you need to upload it to the service, several files can be uploaded. All files uploaded will be taken into account and final coordinate will be a weighted average of the coordinates computed for each file (weights are based on error estimates outputs).
 Press "Start" to upload files.



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Detect the RINeX Observation file you wish to upload.

This	PC > Downloads > myObs
olde	
^	Name
н.	myObs.20o
۸ <i>۴</i> +	the convice will detect all input files it might a

e) After the service will detect all input files it might automatically start analysis of the data

project	profile	date (project creation)	upload	analyse	processinç	action
▶ test20200525		2020-05-25 18:00	 Image: A second s	ш		





f) If the analysis process doesn't start automatically, you can press the "Potion" button to start it.

4		i Starting analys	sing	A	O o	*
project	profile	date (project creation)	upload	analyse	processinç	action
▶ test20200525		2020-05-25 18:00	 Image: A second s	*		

g) Processing should be run afterwards automatically, if not press the "Gear" button to start it.

2 2			1	Д	Q o	*
project	profile	date (project creation)	upload	analyse	processinç	action
▶ test20200525		2020-05-25 18:00	 Image: A second s	 Image: A second s	ш	

h) Using the hot coffee mug, the service lets you know it is processing the data

project	profile	date (project creation)	upload	analyse	processinç	action
▶ test20200525		2020-05-25 18:00	 Image: A second s	× -	4	

i) Once the processing is complete the green V marker will be displayed on all

lumns 🗹						
				_	тж.	_
project	profile	date (project creation)	upload	analyse	processinç	actio
▶ test20200525	GNWEB	2020-05-25 18:00	1	×	 Image: A second s	~

j) know you can download a processing report.

🔳 🖆 🗙			1	<u>д</u>	¢ °	*
project	profile	date (project creation)	upload	analyse	processinç	action
▶ test20200525	GNWEB	2020-05-25 18:00	 Image: A second s	 Image: A second s	× -	 Image: A second s







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 k) To download only the report you can click the "PDF" button. To download all processing information you can click the "Dwonload" button

Name	Туре	Size
est20200525.zip	.zip	67 KB
action	send to email address	send
download		<u>*</u>
show as PDF		因

 After pressing the "Download" button a Zip file will be downloaded to the brwsers default Downloads directory, or a session window will open for you to decide where to save the zip file.





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Content of the Zip file is shown here:

		Extract	test20200525.zip				
ire	View	Compressed Folder Tools					
This	PC > Dov	vnloads > test20200525.zip	~	5	Search tes		
^	Name	^	Туре		Compressed		
	test20	200525.kmz	KMZ File				
	test20200525.lst		LST File				
test20200525.pdf		200525.pdf	Chrome HTML Document				
	test20	200525.sol	SOL File				
	test20	200525.teqc	TEQC File				
	📀 test20	200525_analytic.pdf	Chrome HTML Document	t			
	yosh1	40n.20S	20S File				

KMZ file is an XML file describing the processed point position – <u>in KMZ file format</u>.
SOL / LST are textual files with processing results including error setimates.
PDF file is the processing report.

.20S file is a summary file created by TEQC, which runs some of the analysis on the Observation file by the service.

On any issue regarding the site operation, you may contact the CORS Project personnel:

Email : apn@mapi.gov.il

Tel: +972-3-6231967

Cheers,

CORS Project

These pages were written and edited by Omer Bar

