



iG Receivers Onboard Data Recording FAQ

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Thesis

The iG8 GNSS receivers can build .HCN, .HRC and RINEX files directly. What are the formats and how/why does iGage configure the defaults?

Executive Summary

Don't change the iGage default settings for data recording. We sell more static observation receivers than every other company in the USA combined. **We know what we are doing.**

Additional Reading and Resources

[[OPUS: Best Practices](#)]

[[Trimble Convert to RINEX tool](#)]

[[CHCData tool](#)]

[[Wikipedia: RINEX](#)]

[[TEQC](#)]

Recording Rate Note: 2 Hz, 5 Hz and 20 Hz recording rates

We have modified the iG8 firmware to not support recording rates higher than 1 Hz. If you need/want faster recording rate call us and we will discuss the limitations of high rate recording and set you up with alternate firmware that supports 20 Hz recording.

The Details

Most iGage 'smart' iG receivers (the ones with Wi-Fi) can produce .HCN, .HCR or RINEX observation files. These files contain the raw GNSS information that the OEM engine collects. These observables include both SV ranging information, the broadcast ephemeris and additional system information.

The observation files are most often used to get NGS OPUS reports and to manually post-process Static, Stop-and-Go and Kinematic data between the rover and one or more base receivers.

What is a .HCN file?

In the case of iGage and CHC receivers with Trimble OEM receiver boards (iG8, X91+, X90D) the .HCN file is a true Trimble .CAP RT27 stream file with a 1024-byte header prepended at the beginning.

Typically, iGage receiver users will use the iGx-Download tool to convert .HCN files to RINEX. There is also a more full featured CHCData tool [[CHCData tool](#)] available for manual conversion.

The RT27 stream is a very rich observation stream and you can make 'just about anything RINEX' from it. You can use the official Trimble [[Convert to RINEX](#)] tool once you strip the .HCN header.

A RT27 stream is golden. The .HCN is an encapsulated RT27 stream. Thus a .HCN steam is golden.

What is a .HRC file?

The HRC file is a 'compressed' .HCN file. So a .HRC file will be smaller than a .HCN file.

However a .HCR file takes significant computation resources from the main device engine at run time to compress the stream. There is enough horsepower when the SV count is low. However, when the tracked satellite vehicle count gets above 30 there a chance of CPU saturation.

Other than file size there is no reason to prefer the .HRC over the .HCN. Because there is no tool to strip a .HRC to a RT27 stream and because there is virtually no memory size limitation on the iG devices there is no viable reason to use .HRC in our opinion.

If you choose to make .HRC files you MUST convert the .HRC files with the CHCData program:

[[CHCData tool](#)]

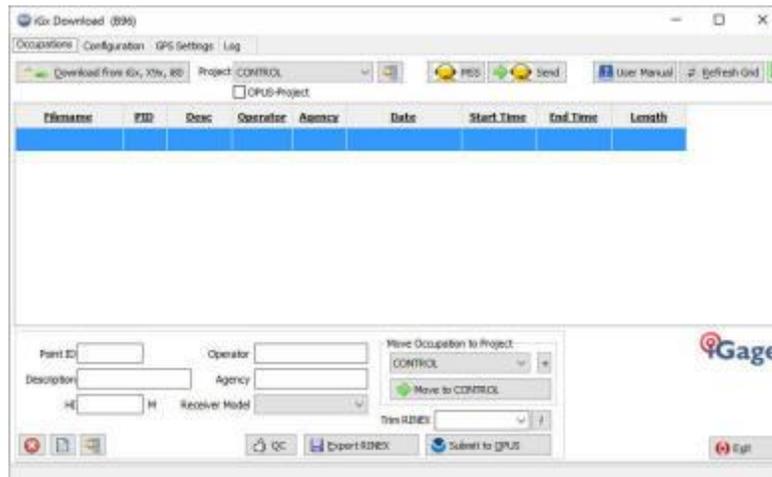
What is a RINEX file?

Lots of information: [[Wikipedia: RINEX](#)]

The iG receivers have to do a real time RINEX decode to make real-time RINEX files. There is enough horsepower when the SV count is low. However, as the satellite vehicle count rises there is a risk of saturating the engine. In addition, there are multiple files created by the onboard RINEX conversion (both ephemeris and observation) so the file transfer requirements are more complicated.

If you make RINEX 2 files, you cannot generate RINEX 3. If you make RINEX 3 you cannot make RINEX 2 files. If you make either RINEX file you cannot change the options they are built with. There is a real chance of saturating the CPU if the satellite count rises (you can control this by setting the elevation mask higher and disabling non-useful SV's like SBAS, QZSS...)

What is the iGx-Download Tool?



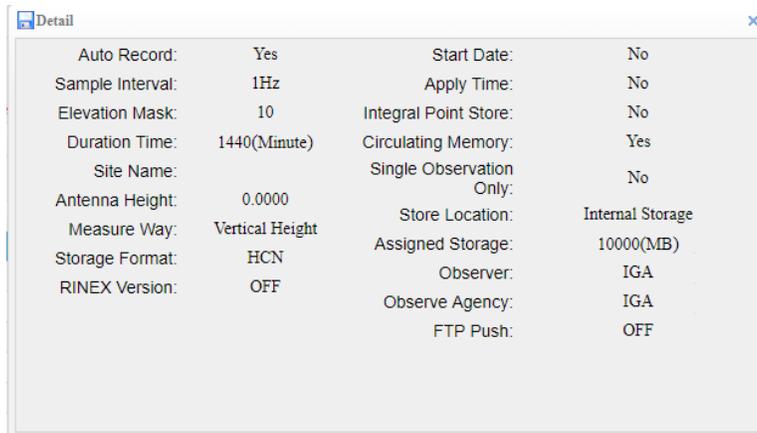
The iGx-Download tool automates the retrieval of observation files from the iGage and CHC heads (however only CHC heads sold by iGage.)

Most customers should use this tool because it automatically takes care of new vs. old files, can trim the beginning and end of an occupation, helps with file organization, automates archives and automates the OPUS submission process.

The automated iGage iG-Download tool only looks for and supports .HCN files. If you choose to build .HRC or RINEX files onboard, you cannot use the iG-Download tool and you will need to manually download files and manually convert them to RINEX.

What are the iGage defaults?

When we ship iG8 receivers they are set to ALWAYS make a .HCN file at 1 Hz in the first 'record1' bin on the receiver:



Auto Record:	Yes	Start Date:	No
Sample Interval:	1Hz	Apply Time:	No
Elevation Mask:	10	Integral Point Store:	No
Duration Time:	1440(Minute)	Circulating Memory:	Yes
Site Name:		Single Observation Only:	No
Antenna Height:	0.0000	Store Location:	Internal Storage
Measure Way:	Vertical Height	Assigned Storage:	10000(MB)
Storage Format:	HCN	Observer:	IGA
RINEX Version:	OFF	Observe Agency:	IGA
		FTP Push:	OFF

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The files are automatically limited to 24-hours (1440 minutes), after 24-hours the current file is closed and a new file is opened. The head will record 24-hour observation files 'forever' if it is left on forever. If the record1 bin reaches 10 GB (10,000 MB) the oldest files are automatically deleted to make room for the new files.

Both bases and rovers record data: always. The only way to change this default behavior is to log into the head by Wi-Fi or with an undistributed tool via the serial port. Since we don't want you changing our defaults the procedure for changing the defaults is not documented.

Conclusion

The only customers who ever have any complaints about data recording on the iG8 receiver are those who change the defaults. We strongly recommend that you not change the defaults.