



Technical Note GPS/GNSS Simulators

## Information about GSG-5/6 synchronization for RSG/REAL TIME/HIL usage

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Subject : This technical note gives information about GSG-6 synchronization consideration for RSG/REAL TIME/HIL usage on GSG-5 and 6 units, especially when integrating your system with OPT- RSG option installed on your simulator unit.

▶ Link : Information about GSG-6 synchronization for RSG/REAL TIME/HIL usage.

Main Web page : <https://www.oralia.com/products/gnss-simulation/real-time-trajectories>

On GSG-6 or GSG-5\* units using OPT-RSG License, it is possible to send multiple commands in one epoch use, between commands and send them all in one write command.

RSG commands can be send to GSG using **IMM**ediate mode, which indicates that the command is to be applied in REAL time. **TIP : you can use console tool in StudioView to send trial commands.**

▶ Link :

[http://manuals.spectracom.com/GSG/Content/GSG/Topics/SCPI/5\\_RSGCmdRef/TIME\\_Parameter.htm](http://manuals.spectracom.com/GSG/Content/GSG/Topics/SCPI/5_RSGCmdRef/TIME_Parameter.htm)

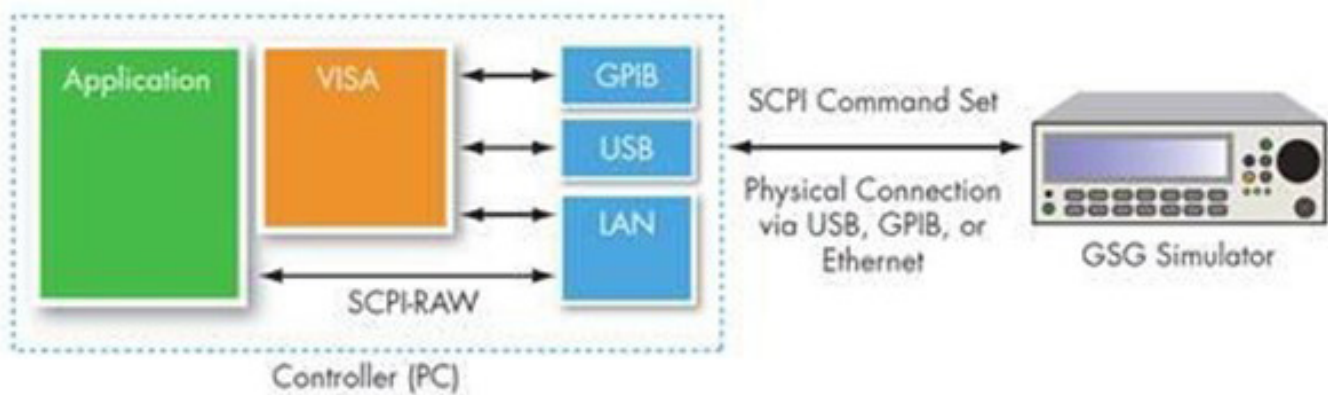
\*Important : OPT-RSG - GSG Real-Time Scenario Generator Option provides GPS/GNSS Realtime Trajectory management capabilities for GSG 5 or 6 systems. **Pre-requisite: 5 Series GSG unit installed with OPT-16 or higher.**

- Communication Interface
  - USB is the recommended interface for RSG.
  - Ethernet can be used, but it is susceptible to network traffic
  - GPIB is not recommended for RSG.

It is strongly recommended to use USB in conjunction with RSG. USB is more reliable due to being a dedicated interface as opposed to Ethernet which can be more susceptible to network traffic.

Ethernet should hence be avoided if attempting advanced steering using high message rates or requiring synchronization at the GSG 10Hz epoch rate.

▶ Link : [http://manuals.spectracom.com/GSG/Content/GSG/Topics/SCPI/6\\_RSGProg/\\_RSG\\_Progr.htm](http://manuals.spectracom.com/GSG/Content/GSG/Topics/SCPI/6_RSGProg/_RSG_Progr.htm)



**It Needs Synchronization :** Synchronization method must be applied. It can be “software” (using \*OPC or \*WAI SCPI command process to drive the set of commands in respect with EPOCH associated)  
 You can also use the pulse output port (Hardware) to sync your system to the GSG and warranty the timing before sending your next command set :

• **Synchronization Methods**

- Purpose - Ensure one set of commands is received each epoch
- \*OPC? - Operation Complete Query
  - The user application holds the next command until a 1 is returned by the device
  - in GSG a one is returned by the device in thhe next 100ms epoch
- \*WAI - Wait to continue
  - Blocks within the GSG instead of user application
  - Waits to apply command until the next epoch
- 10PPS pulse from rear panel
  - Can be used as a trigger to external source to send the next command(s)



**FAQ :**

1 What was its maximum HIL rate?

**100ms iteration rate (10Hz).**

**Also a constant latency time of 100ms has to be considered** (once we send a RSG command, it takes 100ms to read it and take it into use and additional 100ms to get the information back)

2 I believe it does support both a hardware trigger and use of an external reference?

**Yes – 10 MHz frequency reference signal can be use and shared with the global system + Ext external trigger pulse.**

**Also GSG6 10PPS output port can be used as a trigger to external source to send the next command(s)**

[http://manuals.spectracom.com/GSG/Content/GSG/Topics/Conc/RearPa\\_Elemnts.htm](http://manuals.spectracom.com/GSG/Content/GSG/Topics/Conc/RearPa_Elemnts.htm)



### 3 Do you have example of programming process?

On OROLIA web site, you can find examples demonstrate opening an NI-VISA connection with a the simulator, uploading a file, and starting a scenario. It also demonstrates sending and receiving commands available through the Real-time Scenario Generator.

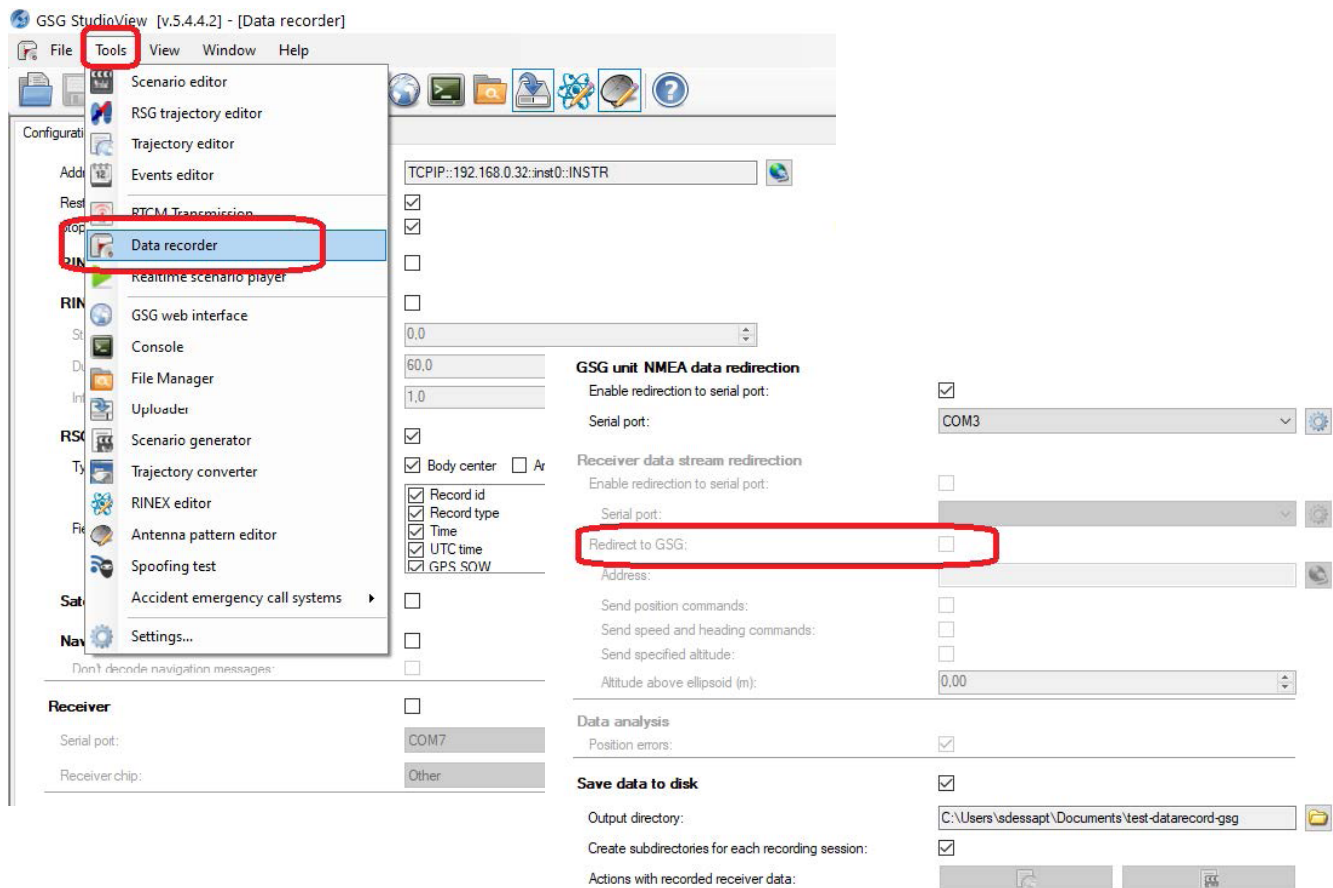
▶ Link : <https://files.spectracom.com/public-downloads/gsg-communication-example>

**Other Tool Alternative : StudioView usage :** As an option in StudioView Software, the NMEA data can also be redirected to a GSG unit, in order to use it with a device that utilizes real-time NMEA data (e.g., a marine plotter or receiver demo software).

Note that GSG does not accept real-time NMEA data, only planned NMEA trajectory data. When redirecting NMEA data to a GSG unit, StudioView actually converts the NMEA data to RSG commands prior to sending the data.

▶ Link : [http://manuals.spectracom.com/GSG/Content/GSG/Topics/Tasks/SV\\_RecordData.htm](http://manuals.spectracom.com/GSG/Content/GSG/Topics/Tasks/SV_RecordData.htm)

Attention : This solution is not recommended for Robust Real Time HIL Systems.



Any additional support need : please reach our support pages dedicated to GSG products :

▶ Link : <https://www.rolia.com/support/testing-simulation>