Signal Power Level Considerations

Compliance: Using an Antenna

Orolia's GSG GNSS Simulator products meet all required regulations of the FCC and CE Mark for operation as electronic test equipment. However, when using the GSG signal generator with an RF antenna (instead of an RF cable), additional regulations controlling the radiation of GPS-like signals into the air must be taken into account by the user:

In the USA, the GPS spectrum is controlled by the National Telecommunications and Information Administration (NTIA): See Sections 8.3.28 and 8.3.29 of the [Manual of Regulations and Procedures for Federal Radio Frequency Management](#).

Depending on your situation, you may need authorization from the FCC to operate at or near the level allowed by the NTIA. A Special Temporary Authorization (STA) or Experimental License may be required. For more information, see the FCC web site: [Link](#).

Countries other than the USA may have their own regulations or restrictions, which you should be aware of and comply with before using the optional antenna.

Transmit Power Level

The U.S. agency NTIA (National Telecommunications & Information Administration) restricts the maximum signal level to -140 dBm (24 MHz BW) as received from an isotropic antenna at a distance of 100 feet from the building where the test is being conducted. Therefore, the maximum power level output from the GSG Signal Generator may need to be limited to conform to this regulation. For example, consider the following test setup:

Antenna distance to nearest exterior wall:	100 ft.
Antenna gain:	0 dB (omni antenna)
Cable loss, antenna to GSG:	0 dB (no cable used)

Using the free space loss calculation for radio propagation:

- Loss (dB) = 20 log10 (4π * Distance / λ)

- Where λ = wavelength: @ 1575 MHz= 19 cm = 0.62 ft
    - Distance = 200 ft total => 100 ft from antenna exterior wall + 100 ft to restricted perimeter

- Loss = 72 dB = 20 log10 (4π * 200/0.62)

Using the free space calculation is a worst case scenario as the wall and any other obstructions will likely reduce the signal even more. Therefore, setting the power output of the GSG to:

-140 + 72 = -68 dBm or less will guarantee compliance.

For additional information on path loss, see e.g., this third-party reference[1]: http://en.wikipedia.org/wiki/Path_loss