GPS M-CODE TEST IMPLEMENTATION
SPIRENT SIMULATOR DATA SETS (SDS)

OPTIONS FOR M-CODE TESTING

Comprehensive development and testing of GPS M-Code receiver technology in an essentially unclassified laboratory environment have been possible by employing AES encryption in accordance with ICD-GPS-700A.

However, user equipment ultimately needs to be tested and certified with the real signal encryption algorithm rather than AES.

Simulator Data Sets (SDS) contain official, pre-encrypted M-Code signal data streams devised by the U.S. Government as a means of testing such GPS Receivers in the laboratory using hardware simulators but without the need to employ the real algorithm in the simulator itself.

SPIRENT AES & SDS TEST IMPLEMENTATIONS

Spirent has supplied AES M-code test capability since 2004 via its SimMCODE option for GSS7700 and GSS8000 GPS simulators.

Spirent's SDS extension to SimMCODE, shown in Figure 1, uses a commercial data server to store the data sets. Code streams are delivered in real time to the signal generator using buffered high-speed LVDS (Low Voltage Digital Signaling) links.

The SimGEN control and modeling software reads low-rate MNAV data and coherent supporting legacy data (almanac, ephemeris and other content) contained in the data sets via an Ethernet TCP/IP link, and ensures M-code signals at L1 and L2 are generated coherently with legacy C/A code and P(Y)-code GPS.

![Figure 1: Spirent SDS M-code Implementation Components](image-url)
The Spirent SDS Upgrade Package for the GSS7700 and GSS8000 GPS Simulators has been granted the NAVSTAR Global Positioning System Joint Program Office Security Approval.

For further information, please contact us.

Product specifications are available upon request.

Performance figures and data in this document are typical and must be specifically confirmed in writing by Spirent Communications plc before they become applicable to any particular order or contract.

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SERVER PC CHARACTERISTICS

- Server running Microsoft WindowsXP® Operating System with manufacturer-supplied Disk Array
- Sufficient space for up to 16 complete 1-hour Simulator Data Sets
- Gigabit Ethernet to allow data set upload of additional data sets as required from customer-supplied external storage
- Programmable data buffer and LVDS interface cards (PCI-format)

SECURITY APPROVAL

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Figure 2: Signal Generator Card, showing LVDS Data Port

The LVDS port on each signal generator card, shown in Figure 2, accepts and de-multiplexes SDS ranging codes in real time via internally fitted buffer cards. The LVDS streams are delivered to the signal generator rear panel in a multi-way cable, as indicated in Figure 1.

Spirent’s SDS implementation retains the full range of simulated vehicle motion and other attributes that are familiar to users of Spirent’s state-of-the-art SimGEN for Windows® application and modeling software to define and control the test environment.