

SISNeT



Integrating Satellite Navigation and the Internet

WHAT IS SISNeT?

SISNeT is a new technology that allows combining the powerful capabilities of Satellite Navigation and the Internet. Specifically, SISNeT allows the access to the wide-area differential corrections and the integrity information of the EGNOS Signal-In-Space (SIS) through the Internet, and in real-time.

The SISNeT project has been developed by ESA during the second half of year 2001. In August 2001, the first prototype of the system was set-up, and the SISNeT concept was successfully validated. Since February 2002, the system is pre-operational, broadcasting an EGNOS-like signal through the Internet, as generated by the EGNOS System Test Bed (ESTB).

Figure 1 shows the architecture of the SISNeT platform. A Base Station takes the ESTB messages using an EGNOS receiver. The messages are transmitted to a Data Server in real-time, using a specific protocol (called SIS2DS). User equipment – which can be implemented on any Hardware and Software platform – gets the EGNOS messages from the Data Server in real-time. The developer of the User Equipment implements Hardware and Software to provide the desired functionality.

WHICH ARE THE ADVANTAGES OF USING SISNeT?

EGNOS will broadcast augmentation signals through Geostationary (GEO) satellites. GEO broadcasting is proved to be an efficient strategy for avionic applications and other modes of transport. For some applications, though, it may be of interest to complement GEO broadcasting through other transmission means. For instance, building obstacles in cities or rural canyons may difficult the GEO reception. In those situations, SISNeT provides a complementary real-time Internet-based broadcasting of the ESTB signal, and a way to continue taking the most of the

EGNOS potential, irrespectively of the user environment.

In a different context, SISNeT allows developing applications needing access to the ESTB signals, without having to invest on an EGNOS receiver.

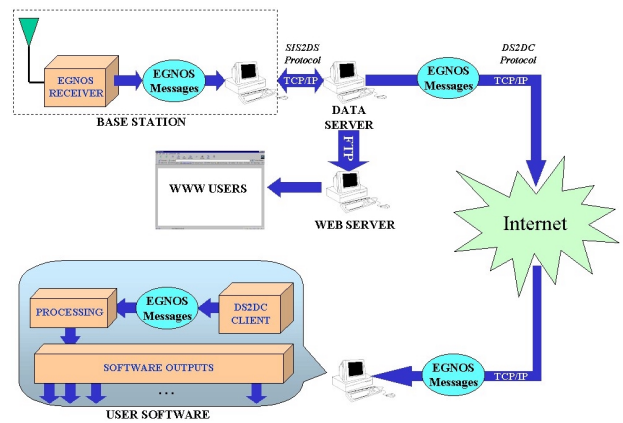


Figure 1. Architecture of the SISNeT System

WHO CAN BENEFIT FROM SISNeT?

Any user with access to the Internet (usually through wireless networks – GSM or GPRS–) may access EGNOS through SISNeT, irrespectively of the GEO visibility conditions.

The Scientific and Engineering communities can also get a huge benefit from SISNeT, since they can exploit the ESTB information without the need of an EGNOS receiver: only a connection to the Internet is needed.

ESA SISNeT DEVELOPMENTS

ESA has recently developed three SISNeT - powered applications, which demonstrate the interest of using that new technology:

- Real-time monitoring of the ESTB performance through the Internet;
- Real-time analysis of the ESTB messages;

- Real-time monitoring of the ESTB performance and SIS status through the World Wide Web. This service is now available through the ESTB website (<http://www.esa.int/estb>).

SISNeT RECEIVER DEVELOPMENTS

Several ESA Contracts are currently ongoing, aiming at developing EGNOS SISNeT - powered receivers and demonstrating the actual achievable performances. These include:

- Development of an integrated SISNeT receiver, containing a GPS receiver and a GSM / GPRS modem;
- Demonstrations of SISNeT receivers embedded in cars and buses;
- Integration of the SISNeT technology in professional software tools;
- Development of a handheld SISNeT receiver, based on an iPAQ PDA (see Figure 2);
- Development of a SISNeT receiver based on a GSM terminal (see Figure 3);



Figure 2. SISNeT handheld receiver (based on an iPAQ PDA)

Internet Resources

| | |
|-------------------------|---|
| ESA Navigation Website: | http://www.esa.int/navigation |
| ESTB Website: | http://www.esa.int/estb |
| ESTB Help Desk: | ESTB@esa.int |
| SISNeT Administrator: | SISNET@esa.int |

Contact the SISNeT Team

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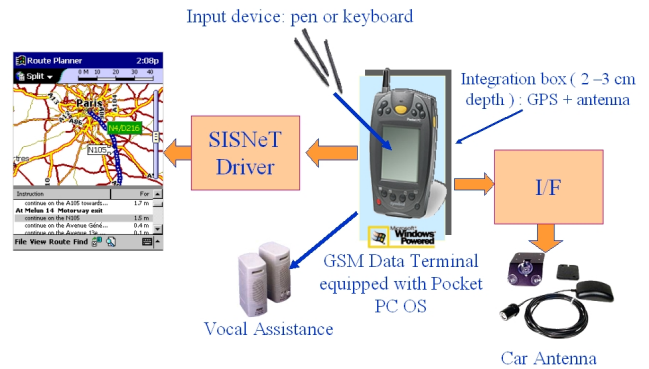


Figure 3. SISNeT receiver based on a GSM / GPRS terminal

HOW TO DEVELOP A SISNeT APPLICATION?

Developing a new SISNeT application involves selecting or implementing a hardware platform (e.g. a PC computer or a PDA), and building the User Application Software (UAS) on it. The hardware part can be freely implemented, without any imposed restriction.

Although the UAS development is extremely flexible, it must respect the specifications included in the SISNeT User Interface Document (UID). The SISNeT UID is available through the Publications Section of the ESTB website (<http://www.esa.int/estb>). The UID contains all the information a developer must know before building an UAS implementation.

Respecting the UID guarantees obtaining a SISNeT-compliant application.

HOW TO ACCESS SISNeT?

Since February 2002, SISNeT is open to any user through an authentication protocol.

A SISNeT account can be requested by sending a mail message to SISNET@esa.int. Each account consists on a username, a password and the IP address / Port needed to access the SISNeT Data Server.

FUTURE UPGRADES

SISNeT is today relying on the ESTB broadcast SIS. This is excellent, for instance, to allow ESTB GEO SIS broadcast monitoring through the Internet, but it does not allow having a real back up of the ESTB GEO SIS in case of GEO outages. In addition, SISNeT adds the GEO transmission delay to the SISNeT broadcasting, and conditions the SISNeT availability to the status of the EGNOS receiver (located at the SISNeT Base station, as shown in Figure 1). For these reasons, ESA has launched a complementary SISNeT development, aiming at directly connecting the SISNeT Base Station and Data Server to the ESTB Central Processing Facility.

The ESA SISNeT concept is an experimental technology, not conceived for commercial purposes. ESA disclaims any liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the use and application of the SISNeT technology presented in this brochure.