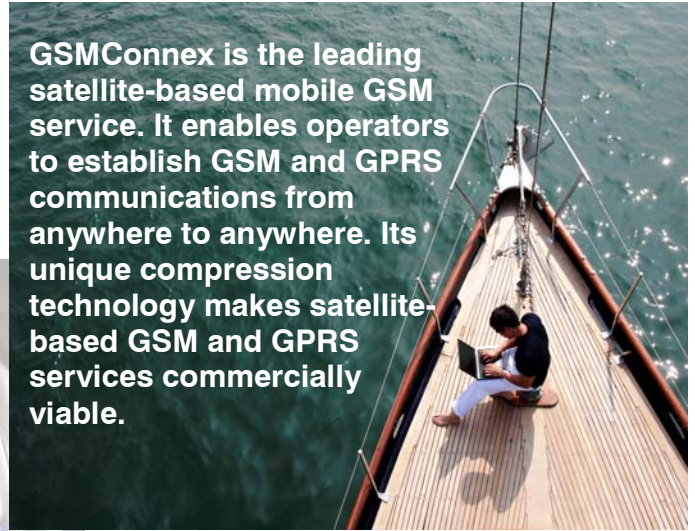


# GSMConnex

## Mobile GSM over Satellite



GSMConnex is the leading satellite-based mobile GSM service. It enables operators to establish GSM and GPRS communications from anywhere to anywhere. Its unique compression technology makes satellite-based GSM and GPRS services commercially viable.



**GSMConnex is suitable for backhauling of GSM networks over most of today's satellite networks**

### Applications for GSMConnex include:

- Mobile networks on aircraft, ships (container ships, ferries, cruise ships, yachts), trains and land vehicles
- Coverage for remote sites (forest camps, oil platforms, mines etc.)
- Quick deployment of GSM coverage in crisis areas, for the early stages of disaster recovery operations

#### **Bandwidth on Demand**

GSMConnex provides operational cost savings by using bandwidth only at the time of communication, meaning there is no redundant usage

#### **Advanced compression**

GSMConnex uses the most advanced header compression and signaling suppression techniques to provide very low bit rates, therefore minimising costs

#### **Prioritisation**

Priority can be given to specific mobile devices, ensuring the network is never busy for the most important traffic

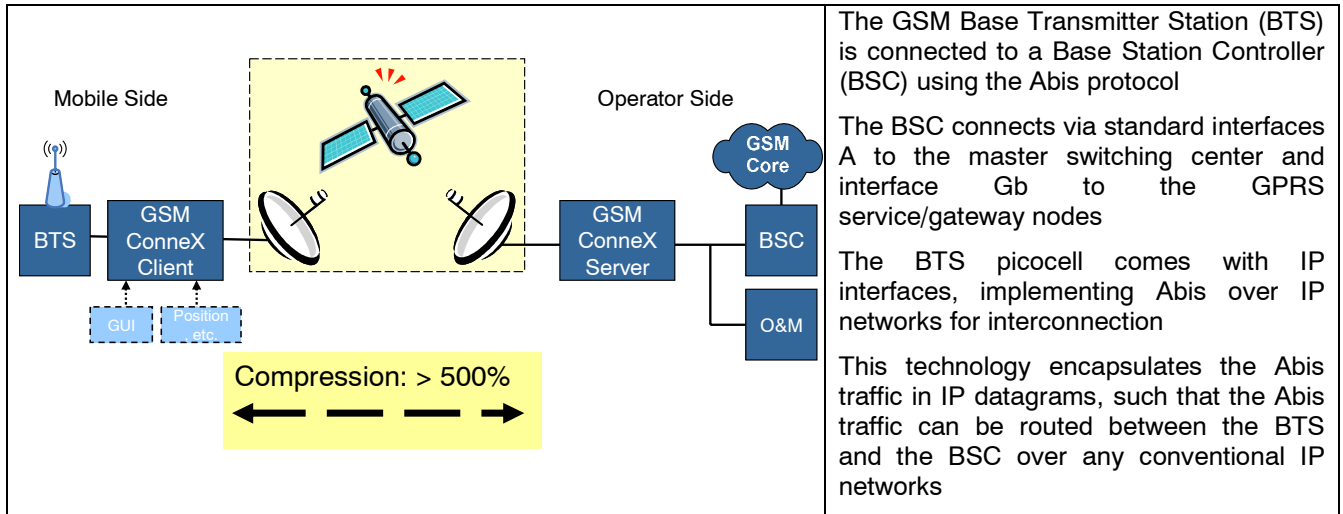
### Current Customer Solutions:

- **OnAir/Airbus**  
inflight passenger communications
- **CargoTrax**  
secure maritime container tracking
- **WISECOM**  
disaster recovery communications

### GSMConnex key features:

- Supported satellite systems:
  - Inmarsat BGAN Swift/Fleet Broadband, Swift/Fleet-64
  - DVB-RCS
  - VSAT (Ku-band)
- Advanced bandwidth saving
- Transparent routing in mobile networks to eliminate changing satellite transport layer
- Network management for mobile or partially available network elements
- Automatic control of Base Transmitter Station (BTS) power and frequency depending on position and altitude of database
- Quality of Service support for GSM over satellite
- Integration of GSM with other services (e.g. IP, WiMax)

## GSMConnex System Architecture



The GSMConnex solution is suitable for backhauling of GSM networks over most of today's satellite networks

**GSMConnex** satellite backhauling solution is interconnected to the Abis protocol over satellite and divides the Base Station Subsystem functions into a BSC at the remote site, which terminates signaling and control to the base station BTS; and a ground BSC, which performs data transcoding and routing to the core network elements.

**GSMConnex** system uses two servers for the satellite backhauling. The BTS is connected via Ethernet to a PC-based Terminal Side GSM Server.

From the Terminal Side Server, GSM signaling and traffic is forwarded via a satellite modem and corresponding satellite Ground Station to a Network Side GSM Server. The Network Side Server is installed at the operator's or customer's site and is connected to the satellite ground earth station by an IP network.

From there, traffic is sent to the Base Station Controller via the Ethernet interface. Both the Terminal and Network Side Servers are managed via the **GSMConnex** Management System.

### Automatic Service Control

**GSMConnex** provides mechanisms to allow or deny individual voice and data GSM services, and incoming and outgoing transmissions. The service control can either be set automatically or used manually via the management system.

### BSC Signaling Suppression

For further bandwidth saving, the Terminal and Network Side Servers suppress periodic GSM signaling messages: the heartbeats on the Radio Signaling Link, GRS network services and Operation and Maintenance Link and RF Resource Indication.

### BSC Signaling Suppression

The BTS picocell supports AMR codecs. The customer can select the codec type and compression settings. Full rate GSM calls are low-rate transcoded in the Terminal and Network Side Servers. The **GSMConnex** system supports GSM Full/Half Rate, Adaptive Multi-rate narrow band (AMR-NB) codecs from 4.75 to 12.2 kbit/s, and enhanced full rate (EFR) codecs.

### IP Header Compression

The **GSMConnex** compression functions are world-leading and provide the means to operate with low OPEX. The satellite transport adaptation functions provide highly efficient use of the satellite link resources, using very low satellite bit rates of 6 kbits per voice call

### Quality of Service Support

**GSMConnex** provides prioritization of GSM voice, GPRS and SMS via scheduling. GSM signaling and GSM voice are scheduled with precedence over the satellite link while SMS and GPRS packet data have the lowest priority

### Automatic BTS Control

The Terminal Side GSM Server hosts a Geographical Information System and Database to control the GSM services, power and frequency of each attached picocell depending on the actual position. Current settings are displayed on the network management system and can be controlled remotely