

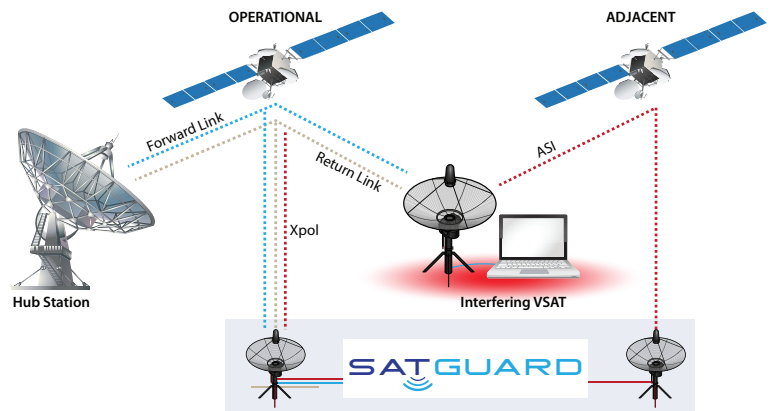
SatGuard - Real-Time VSAT Interference Monitoring

Identify VSAT Terminals Causing Interference in Minutes



VSAT Interference

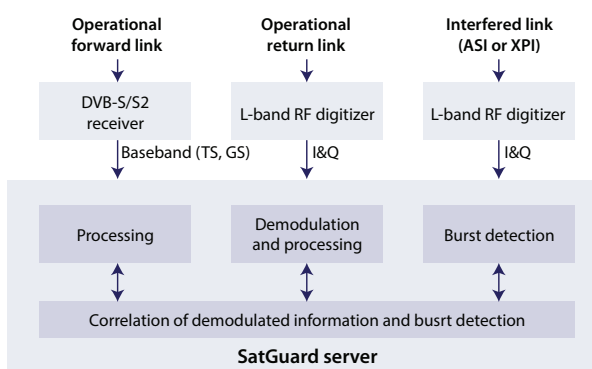
A significant source of RF interference and downtime is due to VSAT systems. Resolving interference caused by misaligned or faulty VSAT terminals is a well-known challenge for satellite operators. The TDMA transmission from a misaligned VSAT terminal negatively impacts services on the opposite polarization (Xpol) or services in a neighboring orbital position due to Adjacent Satellite Interference (ASI). Due to the TDMA nature with many terminals sharing the same inbound carrier, combating VSAT interference has been complicated and time-consuming.



SatGuard - Ending VSAT Interference in Minutes

SatGuard is a product within the Monics family of satellite carrier monitoring and interference mitigation solutions. It was developed to combat and manage interference caused by VSAT terminals. SatGuard measures the individual interference power level for each terminal under normal operations independent of the VSAT hub. By providing this information to the VSAT network operator, the necessary corrective steps to stop the interference can then be taken. SatGuard automatically and quickly determines the VSAT terminals causing the interference by:

- Extracting the terminal ID from the operational link bursts
- Synchronizing the operational and interfered link
- Determining the interfering bursts
- Correlating the information to determine the terminal ID causing the interference



SatGuard reports the power level in the interfered channel for all terminal IDs. Only the terminals transmitting with a power level exceeding the user-defined threshold are reported as a source of interference.

SatGuard operates totally independent of the VSAT network. No interaction with the VSAT hub is required to determine the interfering terminal IDs.

SatGuard may also be operated for cross-beam configurations where the reception of the operational and interfered link may be at different sites. A communication link is then required between the two sites, if the results are to be presented in real time.

Monitoring of Operational Links

SatGuard monitors and demodulates the operational VSAT links. It processes the applicable signalling needed to determine which terminal, identified by its ID, transmits in a given time slot on the TDMA return carriers.

Interfering Burst Detection and VSAT ID

Generally the interfering bursts have too low of a Signal-to-Noise-Ratio (SNR) to be demodulated. Therefore it is the interfering burst power level that is measured in the interfering channel. This information is correlated with the data from the operational links. This enables the interfering power levels for each terminal ID to be determined.

Interference level threshold

SatGuard can measure the interference power level down to 12 dB below the noise floor (SNR of - 12 dB). At this level interference does not cause operational problems.

Supported VSAT technologies

SatGuard supports open standard VSAT technologies such as DVB-RCS/RCS2 and major proprietary VSAT technologies. SatGuard can be adapted to specific VSAT technologies at request.

Carrier Cancellation Options

Provides carrier cancellation for forward link and interfered link with the use of Kratos' SigX signal cancellation product.

| SatGuard Technical Specifications | |
|--|---|
| Inputs | Operational VSAT forward link (L-band) Operational VSAT return link (L-band) Interfered Link, ASI or XPI (L-band) |
| Outputs | List of: <ul style="list-style-type: none">• VSAT Terminal ID (system dependent)• Average interference power level• Maximum, minimum and variance of power level |
| Interference power level measurement threshold | 12 dB below the noise floor (SNR -12 dB) |
| Supported VSAT standards | DVB-RCS DVB-RCS2 Hughes Network Systems |
| Supported proprietary VSAT technologies | Gilat SkyEdge 1 Gilat SkyEdge 2 Gilat SkyEdge 2C iDirect iNFINITI iDirect Evolution Newtec Sat3Play ViaSat LinkStar ViaSat LinkWay Other technologies may be supported upon request |
| Statistics (per terminal) | Allocated bursts count and SNR (average, min., max, var) Measured interfered burst power level (average, min., max, var) |
| Views | Spectrum of monitored links Report of statistics for each Terminal ID |
| Configurations | |
| SatGuard 100S | For co-located operational and interfered link reception site: <ul style="list-style-type: none">• 2 L-band digitizer units for RF capture• Option: Forward link DVB-S/S2 receiver required for RCS, RCS2, Gilat SE2 and Gilat SE2C• Server with Windows OS |
| SatGuard 100D | Version for distributed location of interfered and operational link reception |