

SatGuard - Real-Time VSAT Interference Monitoring

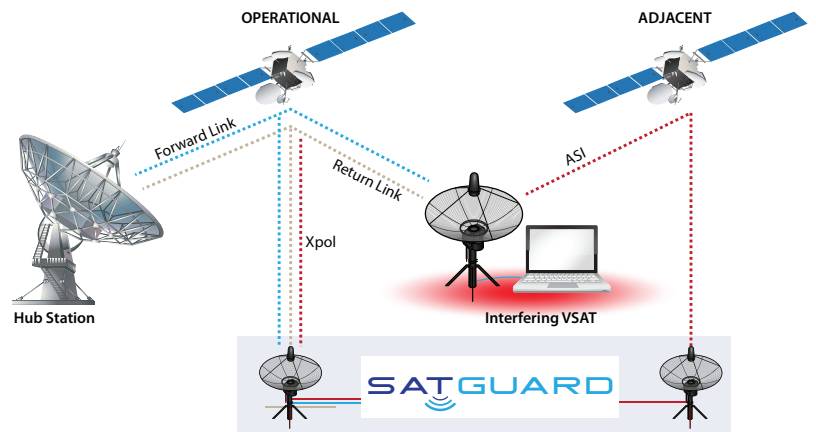
Identify VSAT Terminals Causing Interference in Minutes



SatGuard is a novel solution for combating and managing 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.

VSAT Interference

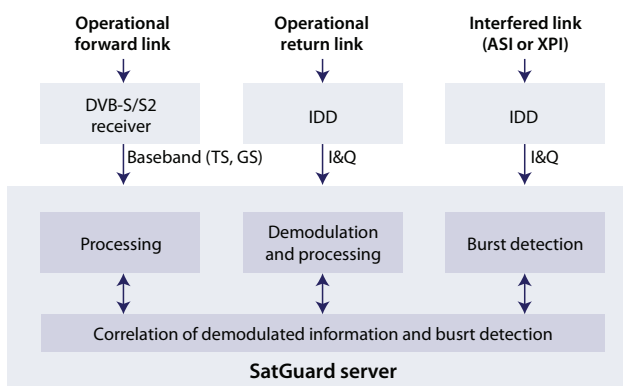
Resolving interference caused by misaligned or faulty VSAT terminals is a well-known challenge for satellite operators. The TDMA transmission from a misaligned VSAT terminal negatively impacts services on the opposite polarization (Xpol) or services in a neighboring orbital position due to Adjacent Satellite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



Introducing SatGuard

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 15 dB below the noise floor. 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.

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	15 dB below the noise floor
Supported VSAT standards	DVB-RCS DVB-RCS2 Hughes Network Systems IPoS and IPoS-B
Supported proprietary VSAT technologies	Comtech Vipersat Gilat SkyEdge 1 Gilat SkyEdge 2 Gilat SkyEdge 2C (Q2 2017) iDirect iNFINITI iDirect Evolution iDirect Velocity Newtec Sat3Play ViaSat LinkStar ViaSat LinkWay, Linkway-S2 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
Carrier Cancellation Options	
Forward link cancellation	Cancellation of up to 60 Msps forward link carrier (QPSK, 8PSK or DVB-S2 CCM/ACM)
Interfered link cancellation	Cancellation of up to 60 Msps forward link carrier (QPSK, 8PSK or DVB-S2 CCM/ACM)
Configurations	
SatGuard 100S	For co-located operational and interfered link reception site: <ul style="list-style-type: none">• 2 PSSR boards for RF capture• Option: Forward link DVB-S/S2 receiver required only for RCS or RCS2• Server or PC with Windows OS
SatGuard 100D	Version for distributed location of interfered and operational link reception sites, where each site may be configured with: <ul style="list-style-type: none">• 1 or 2 PSSR boards for RF capture• Forward link DVB-S/S2 receivers (RCS or RCS2 only)• Server or PC with Windows OS