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Satellite Signal Interference Detection and Monitoring

A White Paper Featuring Test Screen Shots

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Signal interference (SI) impacts satellite operators worldwide with degraded Quality of Service (QoE) and revenue losses. A conservative estimation of the cost of interference to a satellite operator is more than $2M per year. Proper identification of the source of interference and timely response to resolve the issue can significantly reduce this expense.

Avateq's AVQ1022DVBS – RF Signal Analyzer and Monitoring Receiver has been designed to serve the task of early detection and to assist in the identification of the satellite interference type. Even though, there will never be a zero-interference in satellite broadcasting, using a proper tool allows managing its effect.

The most common types of SI are Cross-polarization Interference, Adjacent Satellite Interference, Terrestrial Signal Interference, and Intentional Interference.

Cross-polarization Interference (CPI)

Setting up a satellite antenna requires proper polarization alignment. Incorrect tuning may result in two terminals with signals of opposite polarization leak power into the adjacent polarized signal. Using AVQ1022DVBS, a broadcast engineer can visually identify the CPI and correct the settings.

Adjacent Satellite Interference (ASI)

Two degrees spacing between satellites becomes a norm with more satellites orbiting the Earth; thus Adjacent Satellite Interference is on the rise as well. Generally, it is an installation error that would cause the transmitting antenna to point off-target and to impact an adjacent channel. A sample of this case is shown in Figure 1.

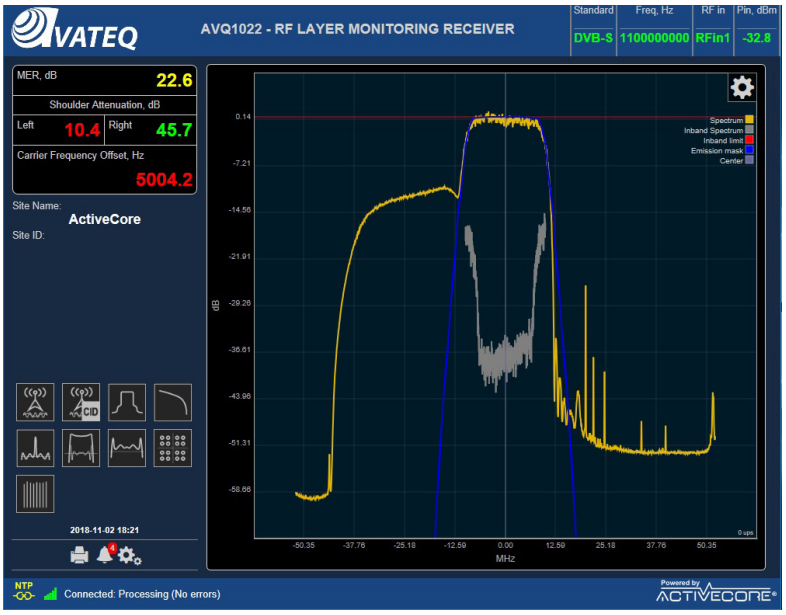

Figure 1: Adjacent Satellite Interference

Carrier ID (DVB-CID) technology can be a great tool to quickly identify and resolve the issue of ASI by decoding the signal operator's information – Figure 2.

Figure 2: DVB-CID (Carrier ID) screen of AVQ1022DVBS

Terrestrial Interference (TI)

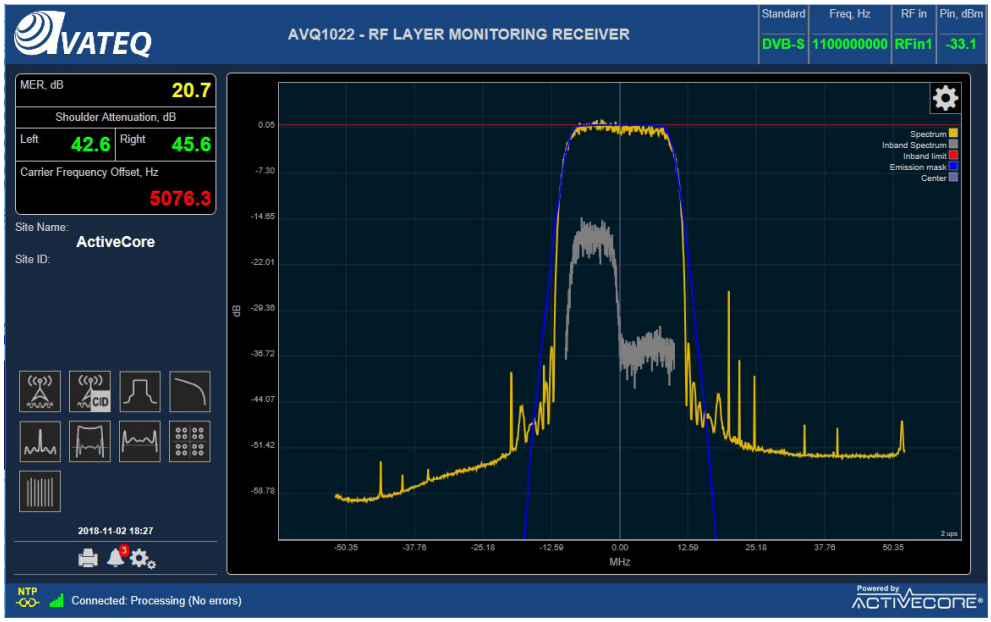

Figure 3: Terrestrial Interference

Interference with terrestrial equipment is typical for C-Band satellite broadcasting. Modern wireless systems – point-to-point microwave links, radars, wireless bridges and mesh networks – operate in low C-Band frequency and, if not coordinated with satellite broadcasters, can unintentionally interfere with the satellite signal. Even though the resolution can be as simple as installing additional filters or adding physical shielding to block the line of sight between interfering antennas, detecting the source of TI can be challenging. AVQ1022DVBS will display the interference, and the internal logging system can help in restoring the timeline of signal quality degradation.

Intentional Interference (II)

In contrast to the terrestrial interference, Intentional Interference is usually easily detected. In many cases, it would be a politically-motivated case to obstruct content delivery to a specific geographical region. Unfortunately, the resolution can be hard to achieve with only technical tools and often requires government authority's intervention. Figure 4 presents a sample case of intentional signal interference.

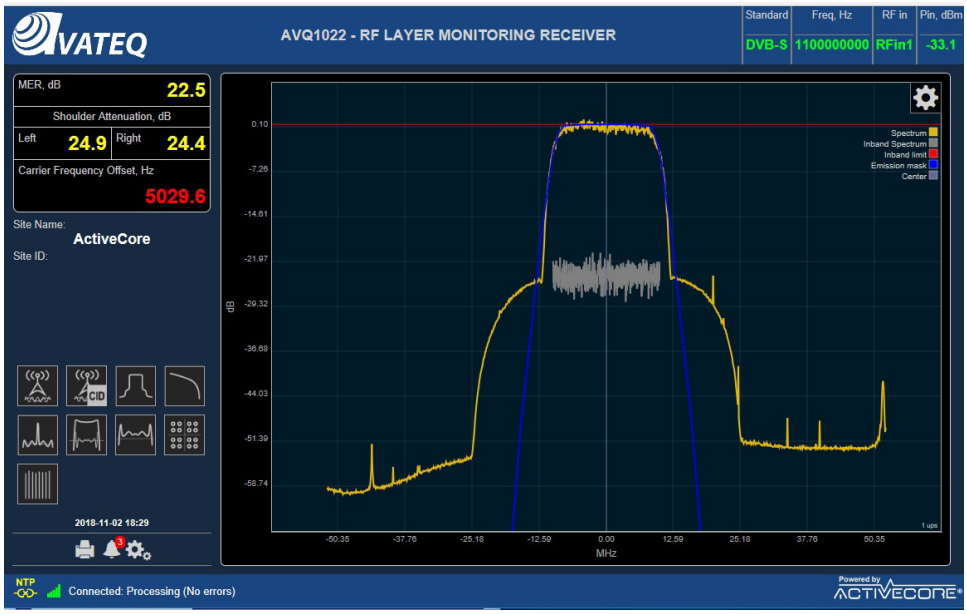

Figure 4
Intentional Interference

Wireless communication is the backbone of technological advancements in all areas of modern life. New frequency assignments and relocations, complex signal propagation schemes and more powerful access point wireless network devices only add to potential sources of interference. Regulatory measures and systems of coordination and cooperation between planners, operators, equipment manufacturers and government authorities should be in place to prevent, monitor, and to respond to signal interference. Avateq's products can be an integral part of the system with its 24/7 remote monitoring capabilities and advance analytical functionality.

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About Avateq

Avateq Corp manufactures cost-effective solutions for signal quality monitoring for digital TV and radio broadcasting standards. Using its core intellectual assets and professional engineering team, Avateq creates practical solutions for complex digital signal processing systems.

For more information contact us:

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