

Interference Mitigation

for Satellite Communications

INTRODUCTION

How to build a fully integrated mobile solution for field RF monitoring in a TV broadcasting business?

Rai Way, a subsidiary of Italian national broadcaster Rai, with over 2300 broadcasting sites using satellites for signal transmission all over Italy, turned to **SAF Tehnika** to find out.

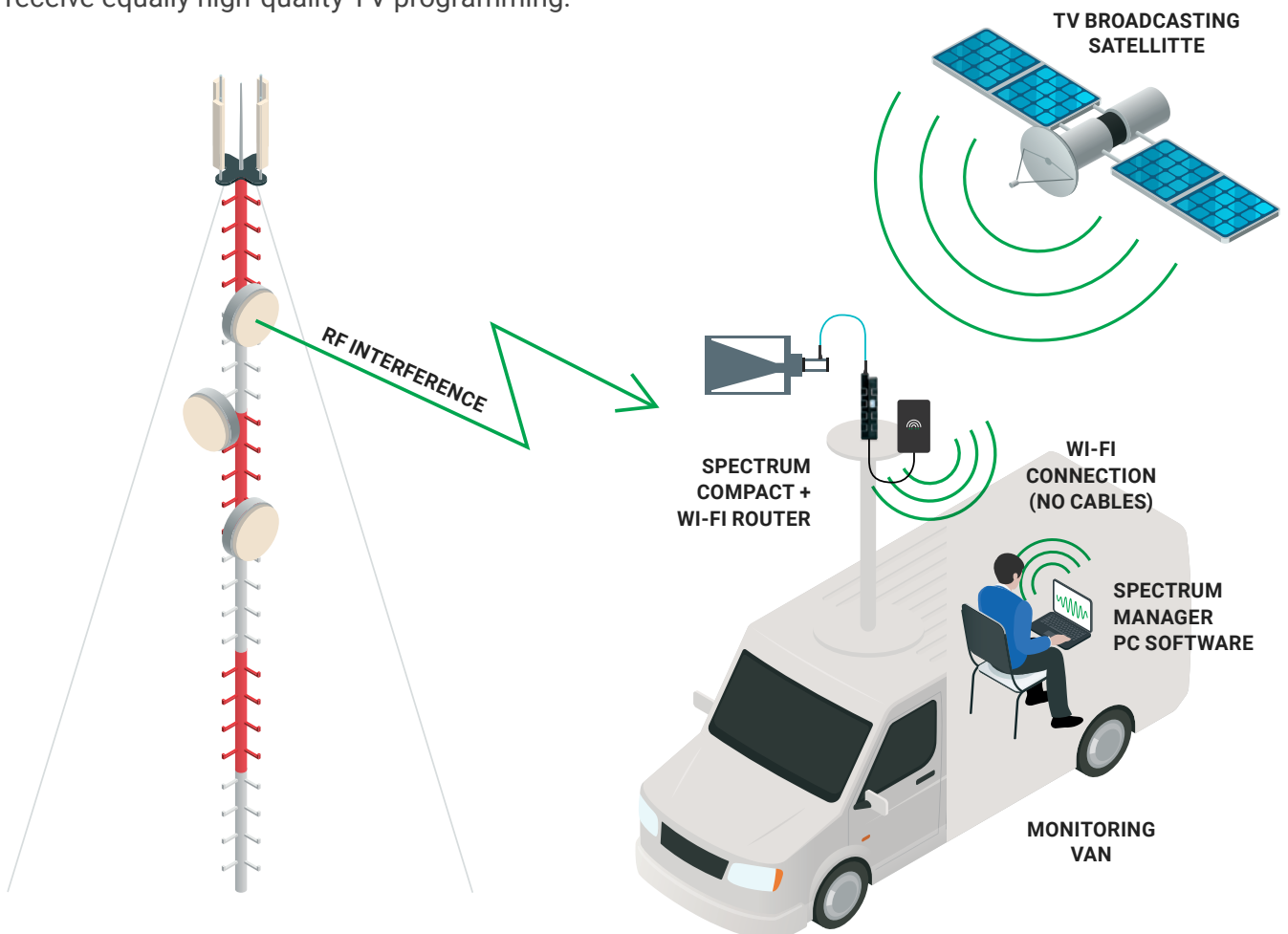
Our team partnered with local specialists **DELO Instruments**, a strategic partner in Italy with years of experience working with our handheld spectrum analyzers – the **SAF Spectrum Compact series**.



TROUBLE IN THE CLOUDS

Why is interference-free satellite signal delivery important for Italy?

In Italy, TV signal distribution varies by region. Metropolitan and densely populated areas primarily use terrestrial networks. Less populated rural and remote locations rely on satellites. These rural areas make up approximately 75% of the country. Interference-free satellite signal delivery helps everyone in the country receive equally high-quality TV programming.



NAVIGATING THE AIRWAVES

With a fleet of monitoring trucks, Rai Way technicians perform daily radio coverage mapping and solve any issues that might have occurred.

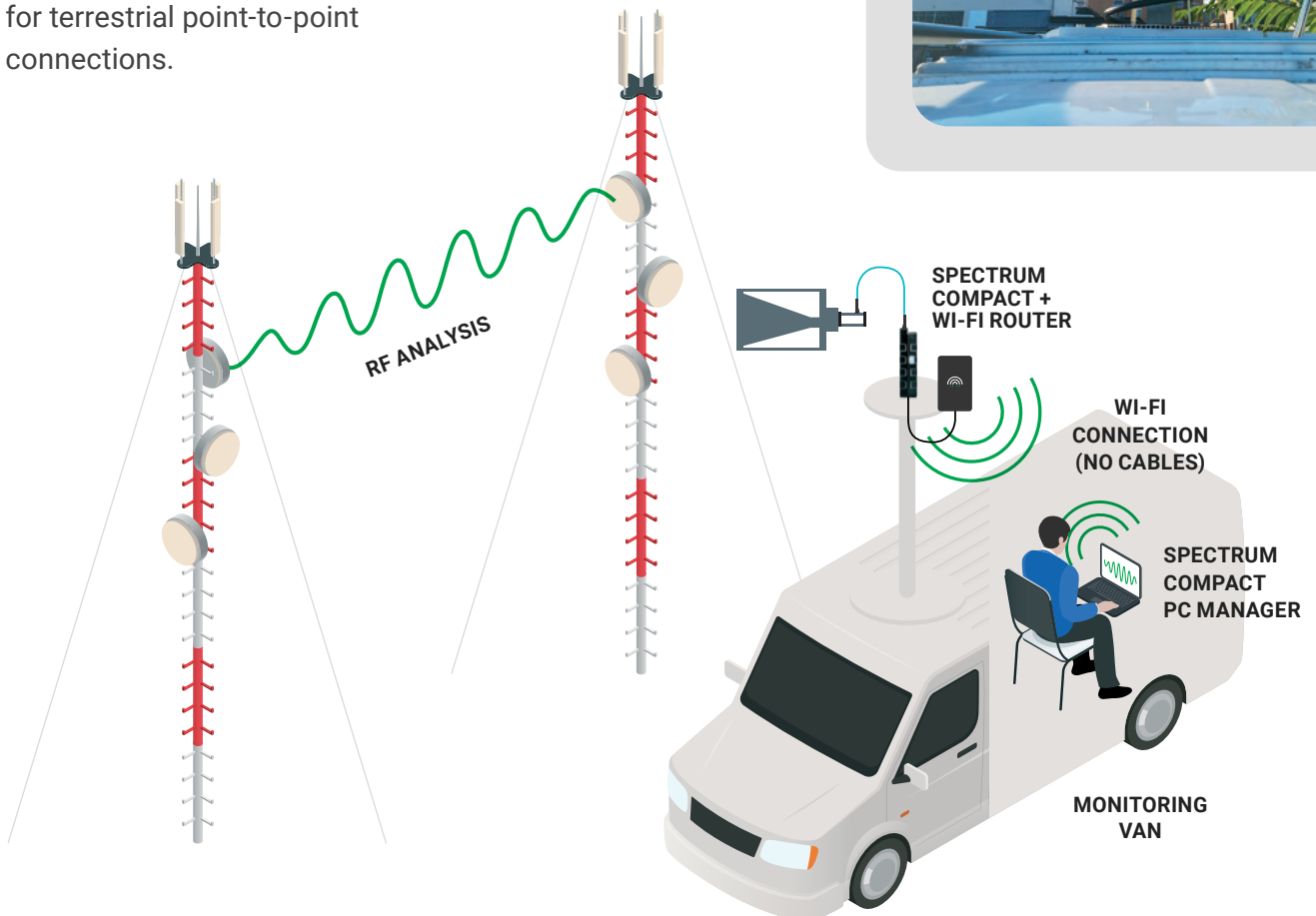
Without the supervision of the fleet, anything can happen – from safe margin degradations to a complete loss of service.

Since interference issues occur regularly, there is a need for a reliable, mobile, and rugged solution. The monitoring trucks typically have a benchtop spectrum analyzer inside, connected to the antenna on top of a 10-meter telescopic mast.

This arrangement creates a long path of RF cable for a signal to travel, which causes considerable signal attenuation when it reaches the input port of the spectrum analyzer, especially critical at frequencies above 10GHz.

In a lot of cases, it makes the received signal unreliable for determining possible interferences and satellite communication troubleshooting.

Apart from helping detect terrestrial interference to satellite signals, the Spectrum Compact solution is useful for detecting the issues interfering for terrestrial point-to-point connections.





Spectrum Compact

Wi-Fi Router

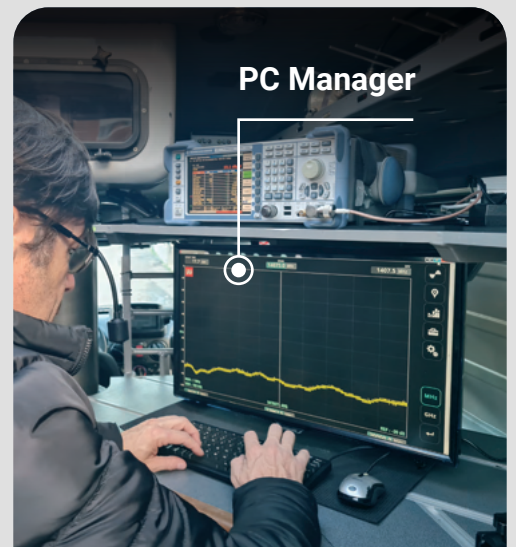
LIFTING IT UP

To avoid attenuation and signal loss, DELO Instruments equipped each van with a Spectrum Compact testing kit to monitor the 10-18 GHz frequency band. The spectrum analyzer kit, connected to the horn antenna and a specially configured Wi-Fi router, can be easily attached to the telescopic pole by using a dedicated bracket.

The solution performs RF spectrum measurements and transmits the results to the van's PC in real time. This allows the operator to react quickly whenever there are irregularities in the RF spectrum. With a battery life of about four hours, the system can be used outdoors for extended periods without needing to recharge batteries.

Because of its open application programming interface (API), compact form factor, and light weight, Spectrum Compact is suitable for integration with various third-party solutions.

Overall, Spectrum Compact is perfectly complementing Rai Way's existing monitoring equipment.



PC Manager

A GOOD VIEW

This solution has many advantages:



By having the spectrum analyzer close to the antenna, the broadcast technicians can reduce the signal loss associated with the cable or waveguide by about 20 dB.



The use of Wi-Fi means that there is no need for cables or waveguides along the telescopic pole.



When not mounted on the extending pole, the Spectrum Compact still works as a standalone handheld spectrum analyzer.

Overall, Spectrum Compact solution helps to speed up the interference detection up to 10 times – from one week to half a day.

THE AFTERMATH

“ Instead of the former messy and long process, Spectrum Compact has significantly simplified the interference detection process.”

says **Vincenzo Potertì**, DELO Instruments.

It was only possible because of the dedication and technical proficiency of **DELO Instruments** and **SAF Tehnika** and thanks to the reliable, out-of-the-box feature set of Spectrum Compact – no hidden costs, no licenses or fees, no heavy lifting or complicated configurations required.



SAF Tehnika is one of the most specialized microwave data transmission technology manufacturers in Europe with long-term competence in the development and production of microwave radios, compact handheld touchscreen spectrum analyzers **Spectrum Compact** and radio signal generators, and IoT wireless monitoring ecosystem **Aranet**.



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