

# Monitoring Broadcast RF-System

## THE Opportunity for the Repack Project

by Christian Brand

### Safety issues in RF-System

Broadcast stations for TV and Radio broadcasting are complex “ecosystem” made of electronics and metal components. Among these parts, antennas, power splitters, cables, filters/combiners, patch panels and transmitters are the most important (and delicate) ones. State of the art transmitters are monitored, however the **performance of passive RF-System** are an unknown. Damage of an antenna, cable or rigid line or as well, water in the system can cause power and heat dissipation; resulting in severe harm of the infrastructure.



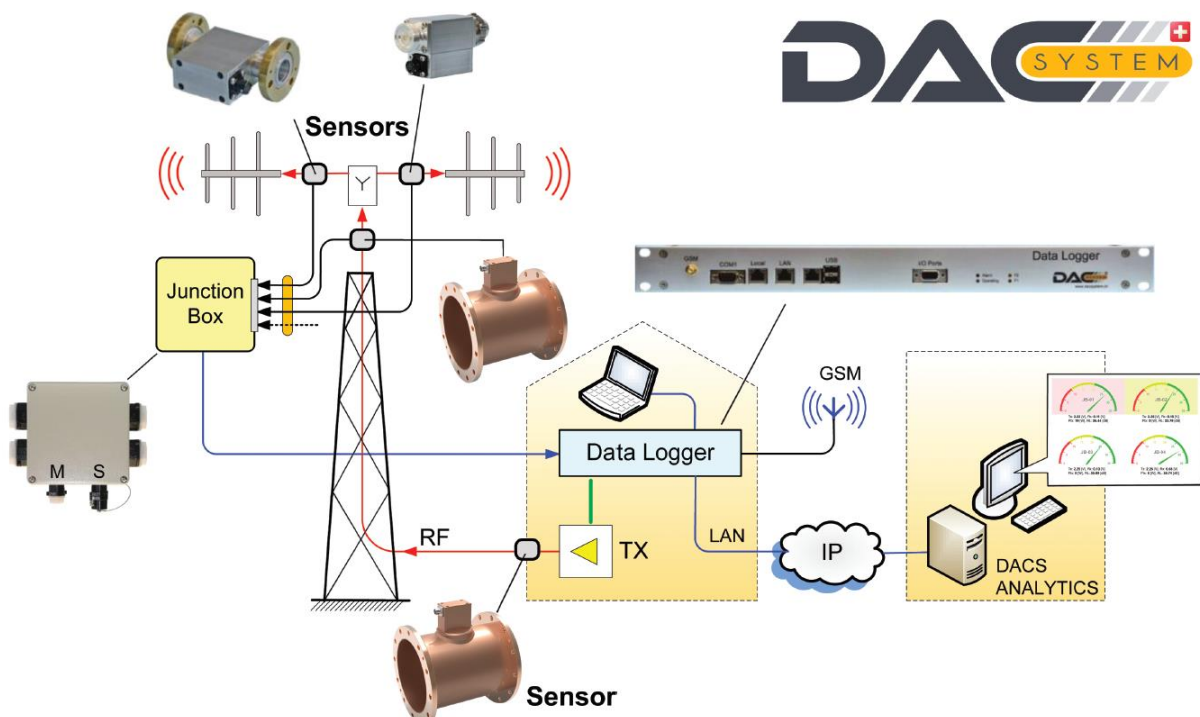
Damaged Rigid Line

Beside long service interrupts, the safety of the infrastructure is endangered. Indication of problems in the passive system are: bad VSWR, high temperature or wrong power values.

### The unique Monitoring Solution of DAC System

The new, innovative and patented monitoring system of DACS gives the operator early notification of malfunctions and allows the instant identification of problems. DACS provides **Outdoor and Indoor** solutions for seamless end-to-end monitoring of RF-Systems. The DACS Monitoring can automatically switch-off the amplifiers with the **SMART PROTECT** function. The infrastructure and significant investments are guarded from damages.

DAC System overview



The operator can **benefit** with the DACS system as follows:

- Do **preventive maintenance** and prevent from partial/total system failures.
- **Minimize SLA violation** caused by “slow death” effects (like water in the system, mechanical abrasion).
- **Safe time and cost for failure detection** because of direct failure localisation.
- **Safe time and costs to repair** because the correct spare material is on site.
- **Safe fixed costs** because of central dispatching and optimized maintenance team assignment.
- **Increase the safety** of the broadcast tower, in case of rf-system failure in the tower, the operator can switch off the amplifier (Power, up to several 100 kW).
- **Support Collocation** by monitoring the Service Access Point (SAP) in sharing broadband antenna systems.
- Qualify outsourced **Operation and Maintenance tasks** by third parties.

**Real time, everywhere, online** the operator has access to the performance of the RF-System.

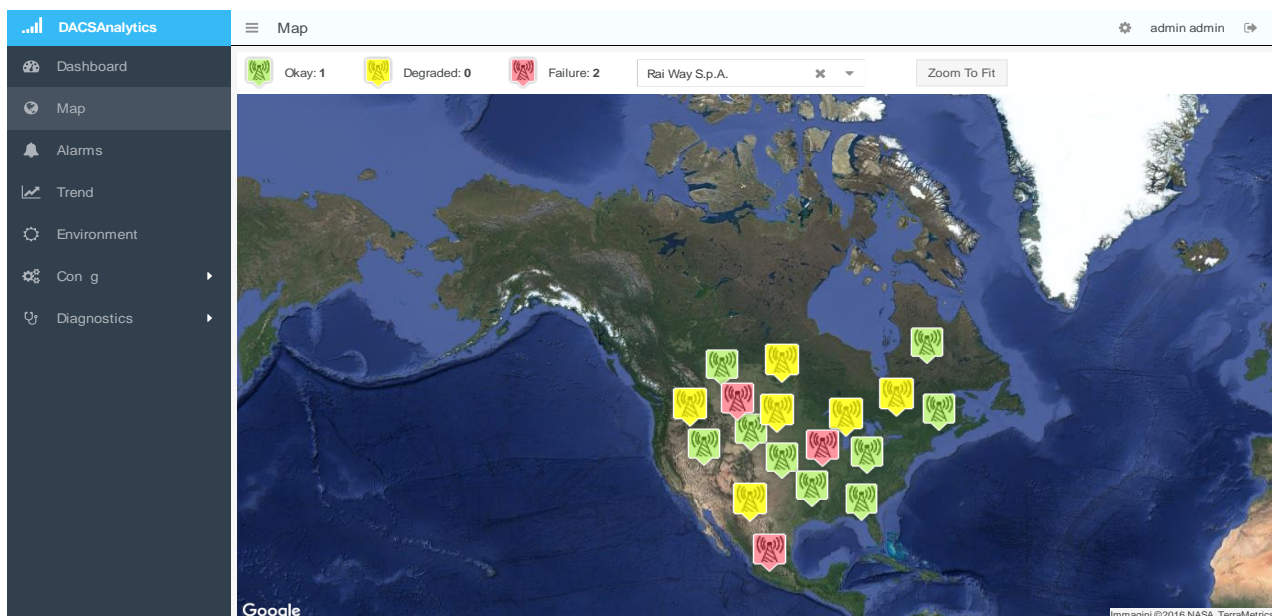
**Outdoor and Indoor**, sensors measure the power and VSWR/Return Loss at any chosen point of the system. The RF-Signal is not affected. This non-invasive solution is the prime choice for **NEW or RETROFIT** installations.

Existing installations are simply **upgraded** by adding the DAC RF-Detector on existing indoor installed directional couplers.



DAC RF-Detector

The DAC System offers an end-to-end solution. **Monitoring results are permanently recorded** and locally and remotely available. DACS Analytics SW is ready for in-house or SaaS (Software as a Service) applications. The features of the web based SW offers Monitoring as a Service (MaaS) to third parties. This is just the first step! The analytics function support in the future with data mining algorithm network improvement and optimization of power consumption and network performance.



DACS Analytics – MaaS

The **repack project is a great opportunity** for the operators to add the DACS monitoring system to the RF-infrastructure. For the next decades it will allow the network operators to address the upcoming challenges of the industry:

- Increased competition (market liberalization, new technologies)
- New business models with collocation and shared infrastructure
- Higher labour costs (smaller and central operation teams)
- Limited access to skilled people (outsourcing)
- High penalties in Service Level Agreements



### **DAC System SA**

DAC System is a supplier of innovative and unique IoT/Monitoring Systems. The self-developed products are based on patented technologies and are manufactured in Switzerland acc. to the highest quality standards. The products and total system solutions are delivered worldwide to broadcast and LMR network operators. The development engineers are able to customize products and solutions for our customers in a very short time. DAC System is incorporated in Lugano, Switzerland



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DAC System provide with its future proof architecture, a **scalable and extendable**

Monitoring System, with:

- Real Time monitoring of all antennas, power splitters/dividers, combiners/filters and control of transmitters
- Instant detection of performance degradation (power and quality)
- Immediate failure detection and localization
- Knowledge of the distribution/radiation of transmission power in the combiner and tower
- Actual vs. theoretical performance monitoring
- Logbook and history data for trend analyzes
- Email, SMS, APP alarms notification, triggered by threshold barriers
- Automatic and remote control of amplifiers with **SMART PROTECT**