



Advanced RF Spectrum & Interference Monitoring

RFGUARDIAN



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Trusted by public safety and utility organizations worldwide, Critical Communication radio ensures reliable, always-on connectivity for field operations, emergency response, and infrastructure protection



DAC solution for mission-critical, multi-carrier, and public safety networks

The  provides MONITORING, Real-Time VSWR and power value measurements for each of the configured channels and for the composite signal, **Spectrum Analysis** and **Interference Detection**



Key Strengths

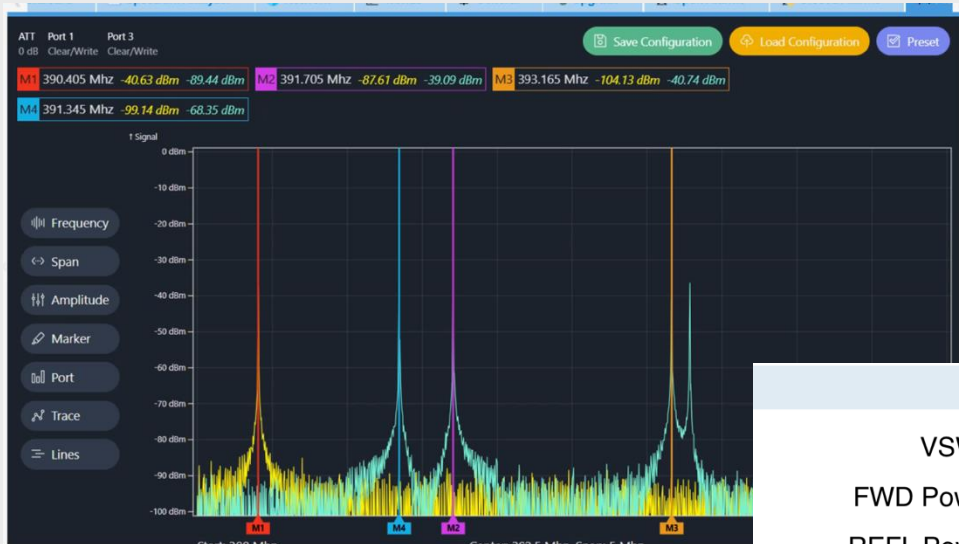
- **Full RF Monitoring:** Composite & per-channel power with RMS or SDR measurements.
- **Interference Detection:** **Spectrum & Waterfall view** reveal intermittent or hidden signals.
- **Event Response:** **Save on Event** captures anomalies for fast troubleshooting.
- **Predictive Analytics:** Noise floor & history enable early fault and interference detection.

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Category	Feature	Description & Benefits
Core RF Monitoring	Main Monitoring Module	Central 1U unit with 4 RF inputs for real-time site monitoring. Performs Forward/Reflected Power and Return Loss/VSWR measurement. Supports RMS readings via detectors and instantaneous per-channel analysis via SDR + FFT, with expected variability on high peak-factor signals.
	Composite Power Measurement	Measures total multi-carrier power; Over-Power and Under-Power alarms prevent transmitter or antenna damage.
	Channelized Power Measurement	Provides instantaneous per-channel power analysis; high/low power alarms identify anomalies on individual carriers in real time.



RF1/RF3			
VSWR [:1]: 10.00			
FWD Power [W]: 0.02			
REFL Power [W]: 0.02			
Channel	Status	FWD Power [W]	REFL Power [W]
041	☐	0.002	0.002
095	☐	0.002	0.002
101	☐	0.001	0.003
122	☐	0.003	0.002
135	☐	0.001	0.003
145	☐	0.001	0.002
171	☐	0.003	0.004
200	☐	0.002	0.002
211	☐	0.002	0.003
299	☐	0.001	0.001

Advanced RF Spectrum & Interference Monitoring



Category	Feature	Description & Benefits
Advanced Spectrum & Interference	Spectrum Plot Viewer	Real-time spectrum display with Peak, AVG, Marker, and Trace modes; SDR + FFT with 50 MHz – 2 GHz coverage for detailed signal monitoring and analysis.
	Waterfall Display	Adds time-frequency visualization, enabling detection of intermittent signals, low-duty-cycle interference, and long-term occupancy patterns.
	Spectrum Up/Down Links	Simultaneous monitoring of uplink and downlink to quickly identify propagation issues or channel anomalies.
	Alert Interference & Save on Event	Detects interference, harmonics, and unauthorized signals. When an event occurs, the system captures spectrum/waterfall snapshots and triggers SNMP or email alerts, supporting post-event diagnostics.



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Category	Feature	Description & Benefits
Noise Floor Analysis	Noise Floor Trending	Tracks long-term background noise evolution, allowing early detection of site RF pollution or environmental degradation.
	Noise Floor Thresholds & Alarms	Sends alarms when noise exceeds defined thresholds, enabling detection of weak or intermittent interference before service impact..
	Operational Value	Combined trending and thresholding enable predictive maintenance, hidden interference detection, and long-term reliability planning



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Category	Feature	Description & Benefits
Network & Remote Management	SNMP Agent v2/v3	Seamless integration with NOC/OSS systems for centralized supervision and alarm automation.
	Remote Configuration	Full remote configuration via Web GUI (HTTP/HTTPS); manage alarm thresholds, channel assignments, and RF bands over LAN/WAN/VPN.
Data Logging & Analytics	Measurement & Event History	Maintains complete historical records of power, VSWR, noise floor, and interference events, enabling trend analysis and long-term performance evaluation
	Event-Driven Logging	Save on Event automatically captures spectrum and waterfall snapshots upon threshold violations or unexpected signals, providing context for post-event root-cause analysis.
	Advanced Reporting & Export	Generates timestamped reports with measurements, alarms, and spectrum images. Supports CSV/JSON export to NOC or analytics systems.
	Predictive Maintenance Support	Historical measurements reveal trends leading to failures, enabling data-driven preventive actions and optimized field operations.
	Audit & Compliance Ready	Provides traceable RF event history for regulatory compliance, public safety audits, and formal incident investigations.



Advanced VSWR & Interference Monitoring



DAC solution for mission-critical, multi-carrier, and public safety networks

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General

Interface Box Dimensions	1RU - 19" sub-rack H43.7 x W483 x D220mm
RF Input Interface	Qty 4, SMA Female-Connectors
Data Interface	2x LAN
Safety	EN60950-1 – EN61326-1
Coupler Dimensions	H54 x W42 x D107mm
Coupler RF interface	4.3-10, DIN 7/16, LOW PIM, other connectors available on request

Power Measurement

Max input power at RF interfaces	+5 dBm
Type of measurement	True RMS sensors and Variable Channel BW sensors available
Return loss accuracy	+/-1 dB
Coupler Insertion loss	≤ 0.15 dB
Coupler Directivity	≥ 35 dB up to 1 GHz ≥ 25 dB up to 2 GHz
Coupler coupling factor	40 dB standard
RF Accuracy	0.5 dB

System

Protocols	SNMP v2.0 , SNMP v3.0 client agent TCP/IP web page Http/Https web interface
Power Supply	90 to 264VAC, 47 to 63Hz – IEC or -48VDC
Operating Temp	-5 to 45 °C (ETSI EN 300 019-2-3)
Weight	3.3 lbs box, 1.3 lbs each coupler

Spectrum Analysis

Technology	14bit ADC + FFT
Frequency Range	50 MHz to 2 GHz
Features	Raw, AVG, Peak, Marker
Ref clock	0.5ppm
RBW Min	244 Hz
Dynamic Range	> 60 dB + input attenuation settings



Multiple Industry Applications:

- **Public Safety & Mission-Critical Communications**
(Police, Fire, EMS, Hospitals, First Responders)
- **Utilities & Critical Infrastructure**
(Energy, Smart Grid, Water, Mining, Oil & Gas, SCADA Networks)
- **Maritime & Offshore Communications**
(Coast Guard, Port Security, Naval Operations, Offshore Platforms)
- **Transit & Transportation Networks**
(Railways, Metro Systems, Highways, Transit Police, Logistics Hubs)
- **Airport & Air Traffic Communications**
(Airport Ground Operations, Safety & Security, Air Traffic Control Systems)



sales@dacsystem.ch



www.dacsystem.ch

Via Cantonale 18–Manno 6928
Switzerland