

DATASHEET

ACTIVECORE® AVQ1022 (2nd gen.) RF SIGNAL ANALYZER



FEATURES:

- **Multi-Standard Platform:** Supports ATSC 1.0, ATSC 3.0, and HD Radio™ on a single hardware engine.
- **In-Band Interference Engine:** Real-time detection, visualization, and PSD estimation of co-channel interference.
- **SFN Echo Profiling:** High-resolution Channel Impulse Response (CIR) with TxID decoding for Single Frequency Networks.
- **ATSC 3.0 STLTP Analysis:** Real-time validation of Studio-to-Transmitter Link IP streams, and PLP demuxing.
- **ATSC 1.0 Transmitter Non-Linearity Analysis:** Live AM-AM / AM-PM curves for DPD calibration and amplifier monitoring.
- **Dual RF Input Option:** A/B input switching for sequential comparison across transmission stages (e.g., pre- and post-RF combiner/filter).
- **Comprehensive Remote Access:** Web GUI, SNMP v2/v3, MQTT telemetry, email alerting, and HTTP/UDP live TS streaming.
- **Optimized Form Factors:** 1U rackmount for transmitter site racks; compact 12 VDC mobile unit for field testing.

DESCRIPTION

Based on the ActiveCore® Platform, the AVQ1022 (1U Rackmount) and AVQ1022m (Mobile) are embedded RF layer signal analyzers designed for remote monitoring of digital transmitter performance and broadcast signal quality.

The AVQ1022 (1U) is tailored for permanent rack installation at transmitter and repeater sites, continuously monitoring RF signal health and reporting metrics back to central NOC management systems. The AVQ1022m provides identical measurements in a portable, lightweight enclosure powered by 12 VDC for field drive tests, coverage verification, and lab testing.

Both units feature a comprehensive automated alarm engine, extensive RF/COFDM diagnostic tools, internal solid-state non-volatile logging memory, and high-speed remote network connectivity. Unit control and operation are primarily managed through an intuitive, password-protected Web GUI, ensuring secure local and remote access across all standard web browsers.

TECHNICAL SPECIFICATION:

	AVQ1022 (1U Rackmount)	AVQ1022m (Mobile)
Application	Tx/Repeater site installation	In-field Testing, Mobile SFN, Lab R&D
Dimensions (W x D x H)	19.0" x 13.0" x 1.7" 48.3cm x 33.0cm x 4.3cm	13.8" x 10.2" x 2.6 35.0 cm x 26.0 cm x 6.6 cm
Power Supply	Internal 110-250 VAC,	12 VDC, 4 A (100-240 VAC adapter included)
Operating Temp.	32 °F to 122 °F (0 °C to +50 °C)	
Cooling	Forced air, internal low-noise fans	
Signal input (RF In)	50 Ω, N-type Female (1x standard, 2nd option)	2 x 50 Ω, N-type Female
Frequency Range	100 MHz to 1000 MHz (VHF / UHF broadcast bands)	
Tuning Step	1 kHz	
Input Power	Off-air: -90 to +0 dBm; Tx Out: -70 to 0 dBm (-20 dBm opt)	
10 MHz Reference	50 Ω, BNC Female, 1 Vp-p sine / square	
Service Port	USB-C (Configuration, Maintenance & Local Console)	
Ethernet Interfaces	2x RJ-45 10/100/1000Base-T (Port 1: MGMT / SNMP / MQTT / TS Stream; Port 2: Data / STLTP)	
Internal Data Storage	Solid-State Internal Non-Volatile Memory (eMMC Flash)	

MONITORED PARAMETERS

General RF Parameters & Plots (All Standards)

Parameters: MER/SNR, Signal RMS, PAPR, Occupied Bandwidth, Frequency Shift (Hz), Sampling Rate Offset, Upper/Lower Shoulder Attenuation, Group Delay across bandwidth.

Plots: Main RF Spectrum, In-Band Interference PSD, Spectral Emission Masks, Channel Amplitude/Phase Response, Constellation, Channel Impulse Response (CIR) / Echo Profile, CCDF curves, Group Delay.

Standard-Specific Highlights

ATSC 1.0: Pilot amplitude/phase errors, EVM, AM-AM/AM-PM curves, 8-VSB Constellation, Eye Diagram, IP TS output.

ATSC 3.0: Frame structure decoding, Bootstrap / L1-Basic / L1-Detail signaling, MER & LDPC BER per PLP, Link Margin (dB), Constellations, STLTP A/324 analysis, live ROUTE/DASH & ALP IP streaming.

HD Radio™: MER per digital partition, service distribution breakdown, live HD audio streaming.

Automated Alarms, Logging & Telemetry

Alarms: Low MER/SNR, RF power loss, shoulder regrowth, frequency shift, CIR echo changes, BER threshold violation.

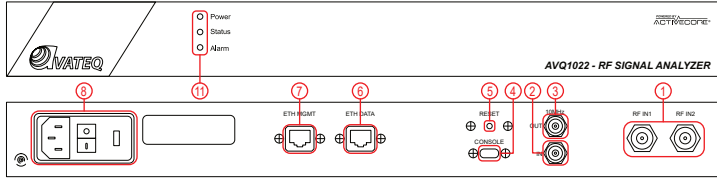
Telemetry & Logging: Password-protected Web GUI, SNMP v2c/v3, MQTT, Email alerts, internal event log, CSV parameter history & snapshots, PDF reports

AVQ1022ATSC (2nd Gen) ActiveCore® RF Signal Analyzer

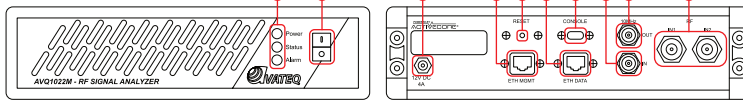
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HARDWARE PANELS & INTERFACES

AVQ1022 (1U Rackmount)



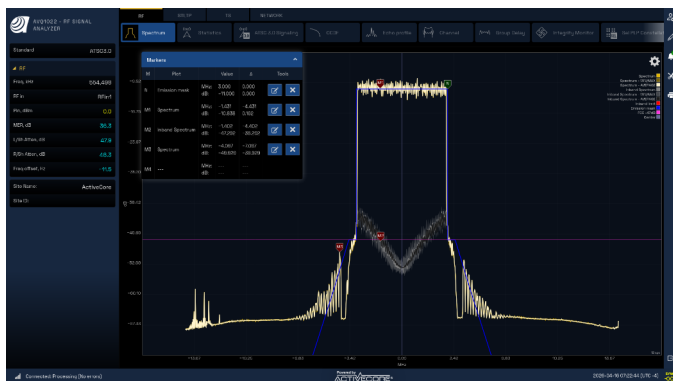
AVQ1022m (Mobile)



#	Label	Description
1	RF IN1 / IN2	RF Inputs (50Ω N-type Female)
2	10MHz IN	10MHz external reference (50Ω BNC Female)
3	10MHz OUT	10MHz output (50Ω BNC Female)
4	CONSOLE	Local service configuration, console, and diagnostics. (USB-C)
5	RESET	Reset to Factory Settings (Push Button)
6	ETH DATA	ATSC 3.0 STLTP Input (RJ-45)
7	ETH MGMT	Web GUI, SNMP v2c/v3, MQTT, Email Alarms, HTTP Streaming (RJ-45)
8		AC Power (IEC C14 Power Inlet with fuse and power switch (110–250 VAC, 50/60 Hz).
9	12V DC 4 A	DC Input Jack
10		Power switch
11	Power/Status/Alarm	Set of LED notifications for Power, System Status, and Alarms

ORDERING INFORMATION AND OPTIONS

AVQ1022	RF Signal Analyzer (1U Rackmount), includes one standard
AVQ1022m	RF Signal Analyzer (Mobile Field Unit), includes one standard
-ATSC1	ATSC 1.0 (A/53, A/153 8-VSB) Standard
-ATSC3	ATSC 3.0 (A/322 NextGen TV) Standard
-HDRADIO	HD Radio™ (IBOC AM/FM) Standard
AVQ1022RF2	Hardware Option: Second RF Input (N-Type 50Ω)
AVQ1022STND1	Software Option: Additional Broadcast Standard License
AVQ1022STLTP	Software Option: ATSC 3.0 STLTP Analysis License
AVQ1022METRIX	Software Option: Advanced Data Integration and Metrics Engine



CONTACT INFORMATION



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ADVANCED MEASUREMENTS & DIAGNOSTICS

In-Band Interference Detection & PSD Estimation: Isolates and visualizes co-channel interferers, illegal pirate signals, and spurious emissions hidden directly underneath the active broadcast carrier.

SFN Echo Profile & Channel Impulse Response (CIR): Delivers high-resolution delay and amplitude measurements of multipath signals, pre/post-echoes, 0 dB echoes, and gap-filler feedback for Single Frequency Network optimization.

Switched Dual-Port RF Monitoring & Chain Comparison: Electronic A/B port selection enables sequential comparison between transmission stages (e.g., pre- and post-RF combiner/filter) to measure insertion loss, shoulder regrowth, and filter distortions, or toggling between Main and Standby transmitters with independent channel presets.

Linear Distortions & Group Delay: Measures amplitude ripple and group delay across the full channel bandwidth to identify bandpass filter mistuning and antenna mismatch.

ATSC 3.0 STLTP Studio Link Verification: Analyzes incoming A/324 IP encapsulation, packet delivery timing, and buffer model compliance directly at the transmitter site.

ATSC 1.0 Transmitter Non-Linearity Characterization (AM-AM & AM-PM): Directly calculates power amplifier compression and phase distortion on the broadcasted signal, allowing engineers to verify Digital Pre-Distortion (DPD) performance without interrupting service.

INTERACTIVE PLOT TOOLS & ACCESSORIES (WEB GUI)

Normal & Delta Markers: Precise readouts for absolute and relative frequency, amplitude, echo delay time (μs), and shoulder attenuation.

Min / Max Trace Hold: Peak and minimum trace envelopes for capturing transient interference and intermittent signal drops.

Manual Scale & Dynamic Zoom: Smooth pan and multi-level zoom across wideband spectrum and deep echo profiles.

2D Cross-Bar Cursor: Interactive cross-hair coordinate tool for cluster and carrier inspection.

User-Defined Threshold Overlays: On-screen visual and automated alarm threshold lines for in-band interference and CIR multipath limits.

APPLICATION BLOCK-DIAGRAM

