

# ACTIVECORE® AVQ1022ATSC (2<sup>nd</sup> gen.) RF SIGNAL ANALYZER FOR ATSC 1.0/ATSC 3.0



## FEATURES:

- ▶ In-Band interference detection and visualization
- ▶ A comprehensive set of analyzed parameters and plots
- ▶ A rich selection of tools for remote monitoring
- ▶ ATSC 1.0 Transport Stream output (HTTP)
- ▶ ATSC 3.0 STLTP and selected service output (HTTP)

## Description

Based on ActiveCore® Platform, **AVQ1022ATSC (2<sup>nd</sup> Gen)** is an embedded RF layer monitoring receiver and signal analyzer for **ATSC 1.0 (A/53 and A/153)** and **ATSC 3.0 (A/322)** digital television standards. It has been designed as an easy-to-use and cost-effective solution for remote monitoring digital transmitter system performance and transmitted signal quality and, therefore, ensuring consistent Quality of Service (QoS) of the network. **AVQ1022ATSC (2<sup>nd</sup> Gen)** features a comprehensive alarm system that can be accessed via multiple interfaces and be set up to control the main components of the transmitter system in case of an emergency. Additionally, with its extensive set of tools for monitoring and analyzing RF and COFDM, the receiver is versatile for use as a stand-alone unit during in-field and production tests.

## Technical Specification

<b>Supported standards<sup>(1)</sup>:</b>	ATSC 1.0 (A/53, A/153), ATSC 3.0 (A/322)	<b>10MHz Reference:</b>	50Ω, BNC, 1Vp-p, sine
<b>Main signal input "RF in":</b>		<b>Control and Monitor Ports:</b>	
Connectors:	Two 50Ω, N-type	Ethernet:	Two RJ45 10/100/1000
Power level:	-70 ... +5 dBm (off-air) -35 ... 0 dBm (Tx output) -20 dBm optimum	<b>Form factor:</b>	1U: 48.3cm x 33cm x 4.3cm (19" x 13" x 1.7") Mobile: 35cm x 26cm x 6.6cm (13.8" x 10.2" x 2.6")
Frequency range:	100 ... 1000 MHz	<b>Operating temperature:</b>	0 .. 50, °C
Frequency tuning step:	1kHz	<b>Power Supply:</b>	1U: 110 - 250V, 50/60Hz AC Mobile: 12VDC, 4Amp

<sup>(1)</sup> Additional standards can be supported. Subject to licensing. Software switchable.

## Monitored Parameters

<b>General parameters:</b>	<ul style="list-style-type: none"> <li>- MER/SNR;</li> <li>- Signal PAPR;</li> <li>- Bandwidth;</li> <li>- Frequency and Sampling rate shifts;</li> <li>- Shoulder attenuation;</li> <li>- Emission/Spectral mask compliance;</li> <li>- Group Delay across bandwidth.</li> </ul>	<ul style="list-style-type: none"> <li>- LDPC BER for L1 and selected PLP;</li> <li>- Bootstrap, L1, and selected PLP constellation.</li> </ul>
<b>General plots:</b>	<ul style="list-style-type: none"> <li>- Spectrum of the main lobe and in-band interference;</li> <li>- Channel Amplitude/Phase and Impulse responses;</li> <li>- CCDF;</li> <li>- Constellation;</li> <li>- Channel Impulse Response / Echo profile;</li> <li>- Group Delay.</li> </ul>	<b>Default set of alarms:</b>
<b>ATSC 1.0 specific:</b>	<ul style="list-style-type: none"> <li>- ATSC pilot Amplitude and Phase errors;</li> <li>- Signal Amplitude/Phase errors;</li> <li>- AM-AM/ AM-PM curves;</li> <li>- Constellation and Eye diagram.</li> </ul>	<ul style="list-style-type: none"> <li>- Input Signal level;</li> <li>- Spectrum shoulder levels;</li> <li>- Signal MER;</li> <li>- CIR / Echo profile variation;</li> <li>- Frequency shift, etc.</li> </ul>
<b>ATSC 3.0 specific:</b>	<ul style="list-style-type: none"> <li>- MER for Bootstrap, L1, and selected PLP;</li> <li>- ATSC 3.0 frame structure;</li> <li>- Bootstrap, L1D, and L1B signaling info;</li> </ul>	<b>Data logging and reporting:</b>
		<ul style="list-style-type: none"> <li>- Detailed report with data and plots;</li> <li>- Event and alarm log;</li> <li>- Main parameters internal log.</li> </ul>
		<b>Software interfaces:</b>
		<ul style="list-style-type: none"> <li>- Web GUI;</li> <li>- SNMP agent;</li> <li>- Email;</li> <li>- MQTT.</li> </ul>
		<b>Additional Tools:</b>
		<ul style="list-style-type: none"> <li>- Selected service streaming:</li> <li>* Reassembled DASH/ROUTE (HTTP)</li> <li>* ALP packets for selected PLP (UDP)</li> <li>- ATSC 3.0 STLTP - verification and detailed analysis</li> <li>- Network tools for connection verification and troubleshooting</li> </ul>

# AVQ1022ATSC (2<sup>nd</sup> Gen) ActiveCore<sup>®</sup> RF Signal Analyzer for ATSC 1.0 and ATSC 3.0

## DATASHEET

### Measurements and Metrics

- ▶ A comprehensive set of tools for remote monitoring of RF at a transmitter site;
- ▶ Frequency spectrum, shoulder attenuation;
- ▶ In-band interference power spectral density;
- ▶ Central frequency shift;
- ▶ Signal statistics: MER, signal RMS, PAPR, signal CCDF;
- ▶ Effects of the transmission system non-linearity measured on the broadcasted signal;
- ▶ Numerical estimation for the signal Amplitude and Phase errors;
- ▶ Linear distortions found in the output RF signal - signal-group delay and frequency response;
- ▶ ATSC 3.0 STLTP detailed analysis and verification;
- ▶ Echo profile with monitoring capabilities for SFN applications.

### Applications

- ▶ ATSC 1.0/3.0 transmitter/repeater performance and 24/7 QoS monitoring;
- ▶ Remote monitoring for broadcasting repeater system network;
- ▶ Test and design verification equipment;
- ▶ Research and development;
- ▶ In-field and production testing.

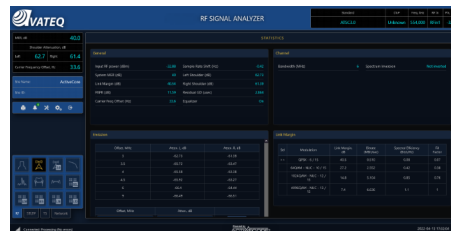
### Plot tools and accessories

- ▶ Normal and Delta markers;
- ▶ Min/Max hold;
- ▶ Manual scale adjustment;
- ▶ Cross bar;
- ▶ Thresholds for CIR profile and in-band interference level.

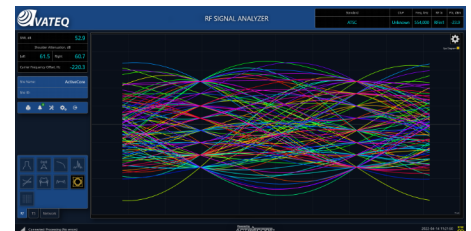
### Samples of Reported Parameters and Plots



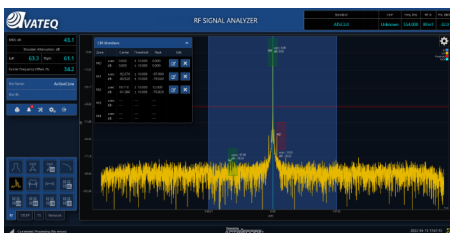
ATSC 3.0 Spectrum with In-Band



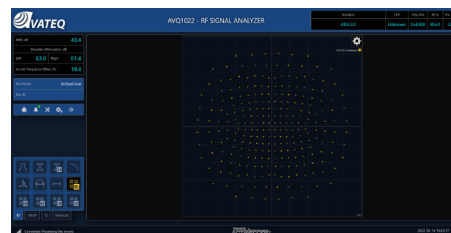
ATSC 3.0 Statistics with Link Margin



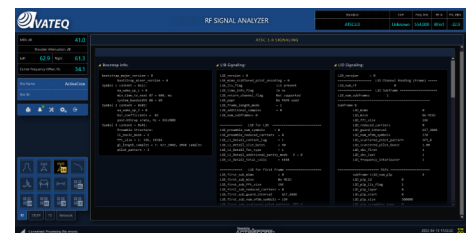
ATSC 1.0 Eye Diagram



CIR profile

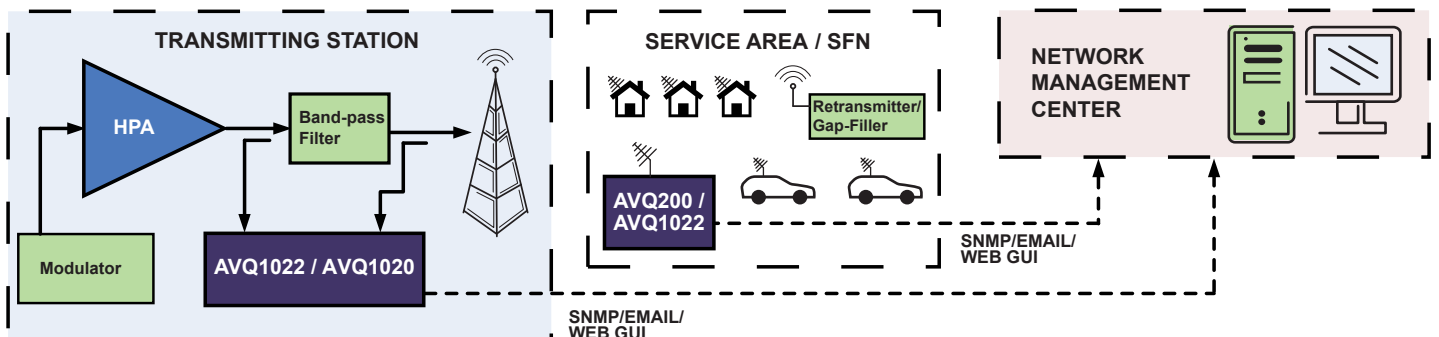


ATSC 3.0 256QAM-NUC Constellation



ATSC 3.0 Signaling Information

### Application Block-Diagram



### Contact Information

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