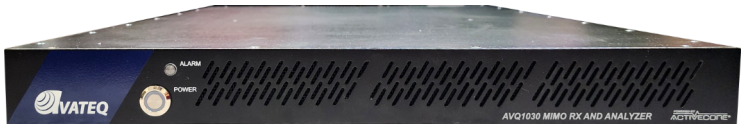
AVQ1030
ATSC 3.0 MIMO RECEIVER AND ANALYZER

FEATURES:

- ► **Support for ATSC 3.0 LDM MIMO mode (A/322:2024-09)**
- ► **In-Band interference detection and visualization**
- ► **A comprehensive set of analyzed parameters and plots**
- ► **A rich selection of tools for remote monitoring**
- ► **Spectrum sharing and bandwidth usage statistics**
- ► **ATSC 3.0 STLTP and selected service output (HTTP)**



Description

Based on the industry verified ActiveCore® Platform and AVQ1022 RF Signal Analyzer, **AVQ1030 ATSC 3.0 MIMO Receiver and Analyzer** provides real-time demodulation, and service data reassembling from two RF signals transmitted over a cross-polarized 2x2 MIMO scheme and modulated per **ATSC 3.0 A/322** specification. Beside the MIMO functionality, the receiver offers a comprehensive set of tools for monitoring, analyzing, and troubleshooting the RF signals quality including toughest MIMO reception scenarios of poor antenna ports isolation or cross-polarization discrimination. Detailed analysis of each component of the ATSC 3.0 physical layer framing structure, Avateq's proprietary in-band interference and link margin estimation, echo profile with monitoring capabilities for SFN applications make the receiver the indispensable tool for RF performance verification in MIMO scheme.

With the ability to provide spectrum sharing and bandwidth usage statistics for each service, the receiver can be used for building metered/managed content delivery networks.

Technical Specification

Supported standards:	ATSC 3.0 (A/322:2024-09)	**Control and Monitor Ports:**	
Main signal input "RF in":		Ethernet:	Two RJ45 10/100/1000
Connectors:	Two 50Ω, N-type	**Form factor:**	1U: 48.3cm x 76.2cm x 4.3cm (19" x 30" x 1.7")
Power level:	-70 … +5 dBm	**Operating temperature:**	0 .. 50, °C
Frequency range:	100 … 1000 MHz	**Redundant Power Supply:**	2 x 110 - 250V, 50/60Hz AC
Frequency tuning step:	1kHz		
10MHz Reference:	50Ω, BNC, 1Vp-p, sine		

Monitored Parameters

General parameters:	- MER/SNR; - Signal PAPR; - Bandwidth; - Frequency and Sampling rate shifts; - Shoulder attenuation; - Emission/Spectral mask compliance; - Group Delay across bandwidth.	**Default set of alarms:**	- Input Signal level; - Spectrum shoulder levels; - Signal MER; - CIR / Echo profile variation; - Frequency shift, etc.
General plots:	- Spectrum of the main lobe and in-band interference; - Channel Amplitude/Phase and Impulse responses; - CCDF; - Constellation; - Channel Impulse Response / Echo profile; - Group Delay.	**Data logging and reporting:**	- Detailed report with data and plots; - Event and alarm log; - Main parameters internal log.
ATSC 3.0 specifics:	- MER for Bootstrap, L1, and selected PLP; - ATSC 3.0 frame structure; - Bootstrap, L1D, and L1B signaling info; - LDPC BER for L1 and selected PLP; - Bootstrap, L1, and selected PLP constellation.	**Software interfaces:**	- Web GUI; - SNMP agent; - Email; - MqTT.
		Additional tools:	- Selected service streaming: * Reassembled DASH/ROUTE (HTTP) * ALP packets for selected PLP (UDP) - ATSC 3. 0 STLTP - verification and detailed analysis - Network tools for connection verification and troubleshooting

AVQ1030 ActiveCore®
ATSC 3.0 MIMO RECEIVER

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.

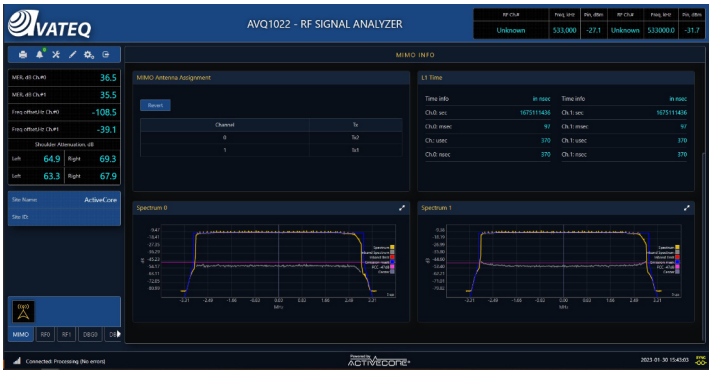
Applications

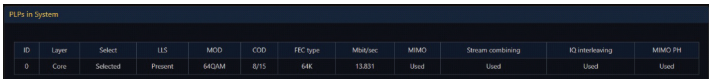
- ATSC 3.0 MIMO transmitter performance and 24/7 QoS monitoring;
- Metered / Managed content delivery networks;
- Test and design verification equipment;
- Research and development;
- In-field and production testing.

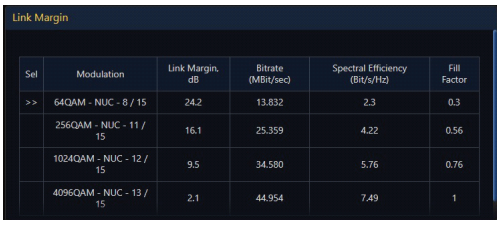
Plot tools and accessories

- 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

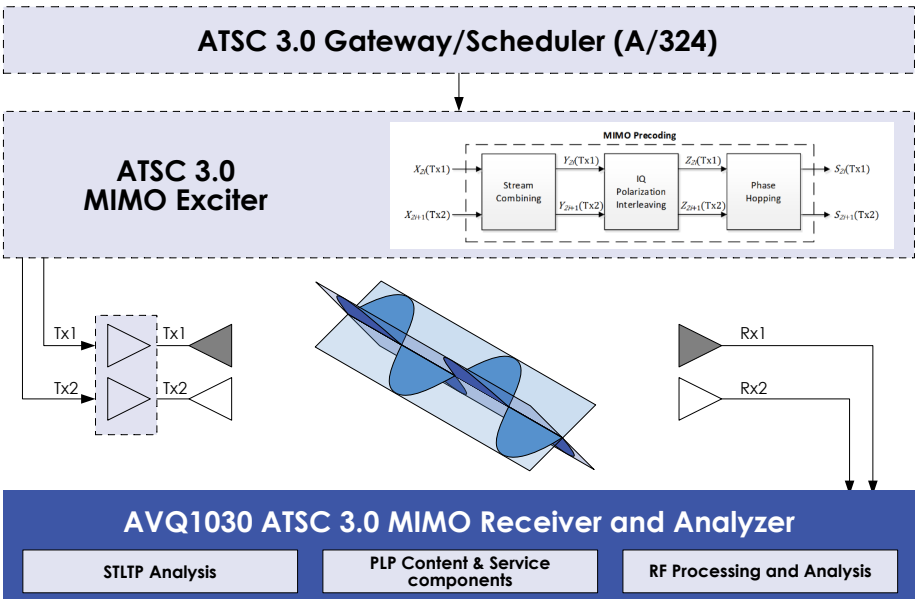






Sel	Modulation	Link Margin, dB	Bitrate (MBit/sec)	Spectral Efficiency (Bit/s/Hz)	Fill Factor
>>	64QAM - NUC - 8 / 15	24.2	13.832	2.3	0.3
	256QAM - NUC - 11 / 15	16.1	25.359	4.22	0.56
	1024QAM - NUC - 12 / 15	9.5	34.580	5.76	0.76
	4096QAM - NUC - 13 / 15	2.1	44.954	7.49	1

Application Block-Diagram



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