Quasonix

MADE IN USA

Rackmount Receiver Analyzer

Measure Twice, Launch Once

Verify your pre-flight receiver configuration with the Quasonix Receiver Analyzer. With a system-wide total of four signal sources and six channel path emulators, complex scenarios can be effectively modeled and tested. The powerful new UI allows extensive customization, flexibility, and automation. Quasonix is… Reinventing Telemetry™.

Versatile Rack-Mount Enclosure with USB Interface — Compact 1U 19" rack-mount chassis provides a single-box receiver analyzer solution, with USB plug and play; RA 3.0 extends capability and performance dramatically using existing fielded hardware.

Internal Signal Generators — Includes two complete ARTM signal generators covering 200 MHz to 2500 MHz and 4.4 GHz to 5.25 GHz contiguously, with power levels from 0 dBm to –125 dBm.

Multipath Channel Emulator — Provides 6-ray multipath emulation plus line-of-sight for static and dynamic multipath testing.

Internal Bit Error Rate Testers (BERTs) — Eight bit error rate testers with integrated synchronization detection/ measurement and bit rate counters.

Powerful User Interface runs on any Windows 10 or 11 PC — Easy-to-use, fully configurable graphical user interface provides incredibly responsive control of all Receiver Analyzer functions and monitoring of all receiver status; make the interface as simple or as full-featured as needed.

Receiver Performance and Functionality Tests — Comprehensive telemetry receiver test suite includes DQE/ DQM verification, bit error rate, noise figure, receiver latency, acquisition time, acquisition threshold, combiner/BSS break frequency, combiner gain, equalizer multipath performance, and PCM/FM modulation index tests.

User-Definable Automated Tests — Fully customizable test capability allows modifying standard tests or defining new test scenarios to provide almost limitless automatic receiver testing.

Dynamic Graphing and Logging of Automated Test Results — Automated tests display results in interactive charts, in real time, and allow saving acquired data in several formats including customizable .CSV files for post-test processing and analysis.
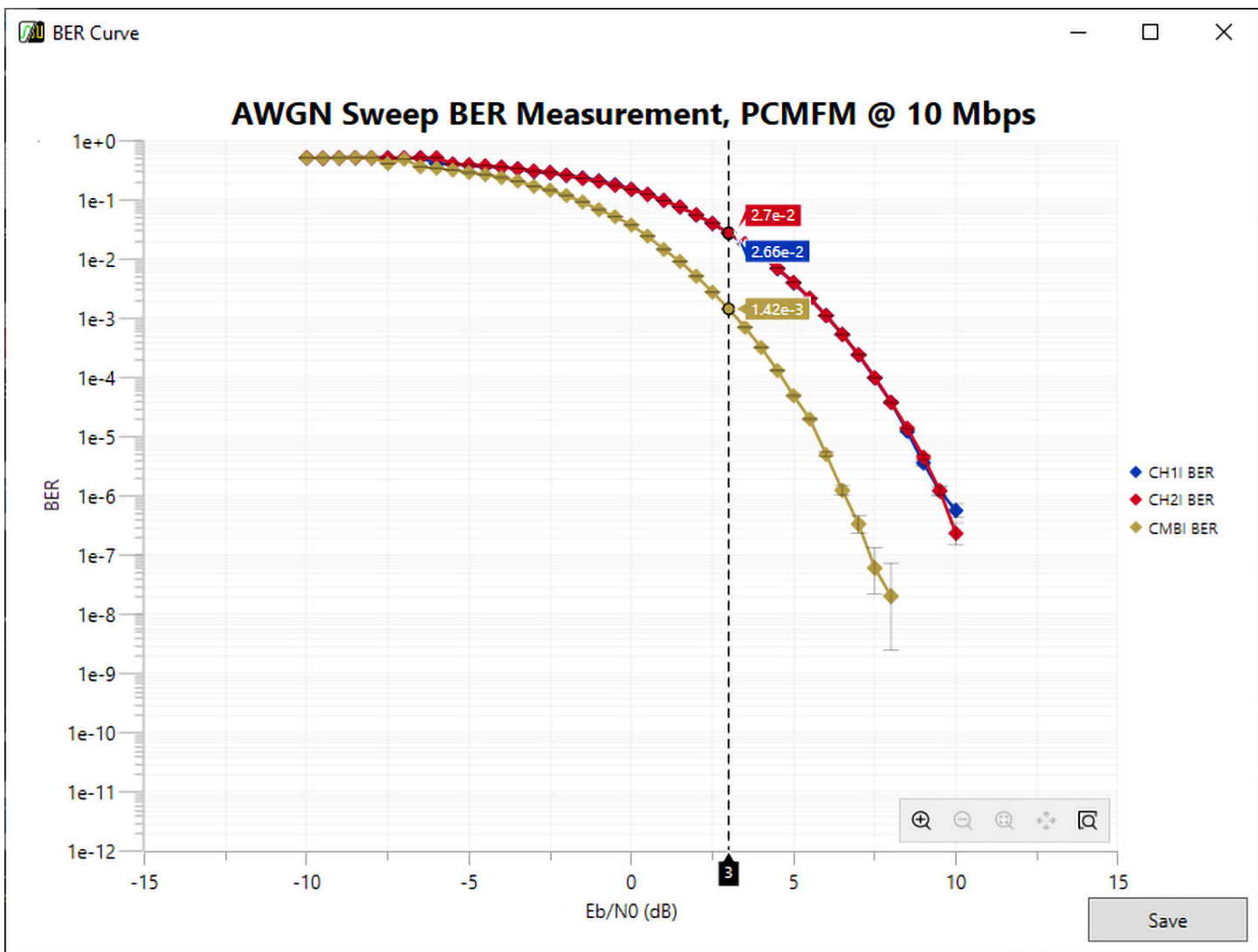
DQM-Based Testing — Use calibrated DQM rather than bit error rate measurements to decrease test time by orders of magnitude.

NEW: RA 3.0 - available as a free upgrade to existing Receiver Analyzers

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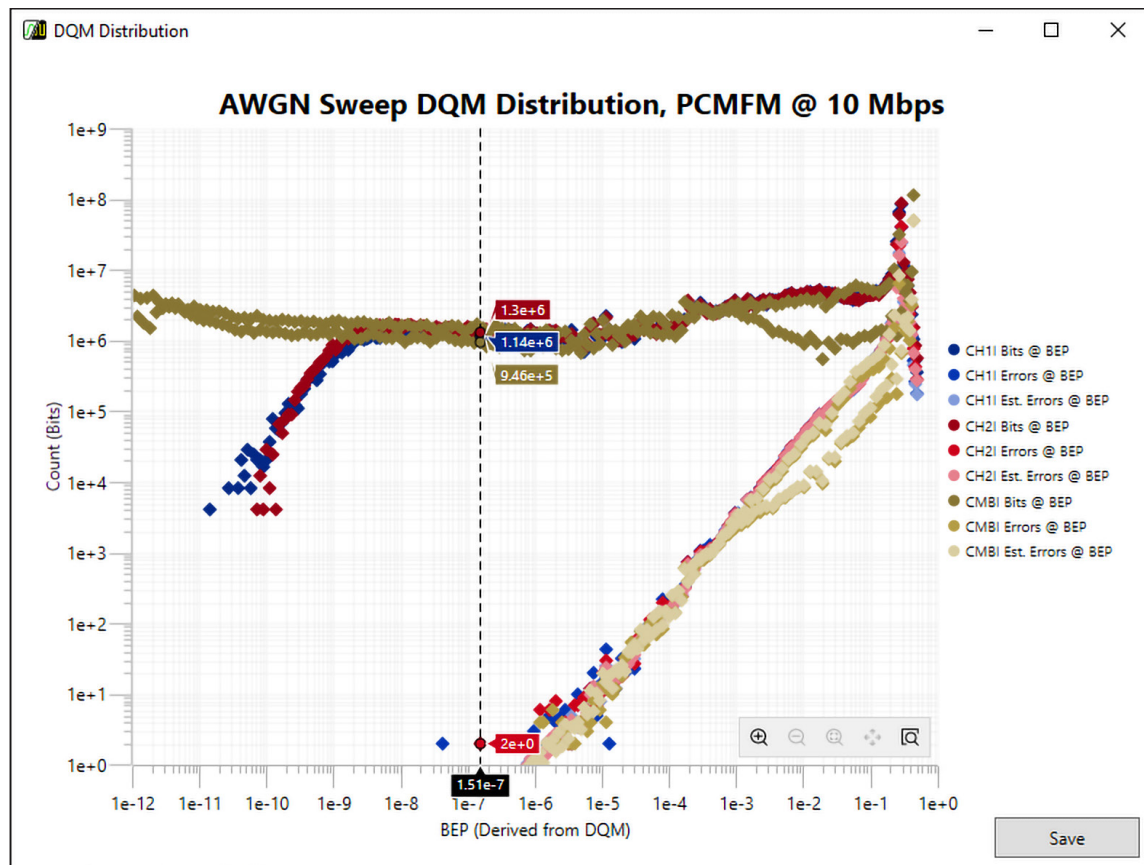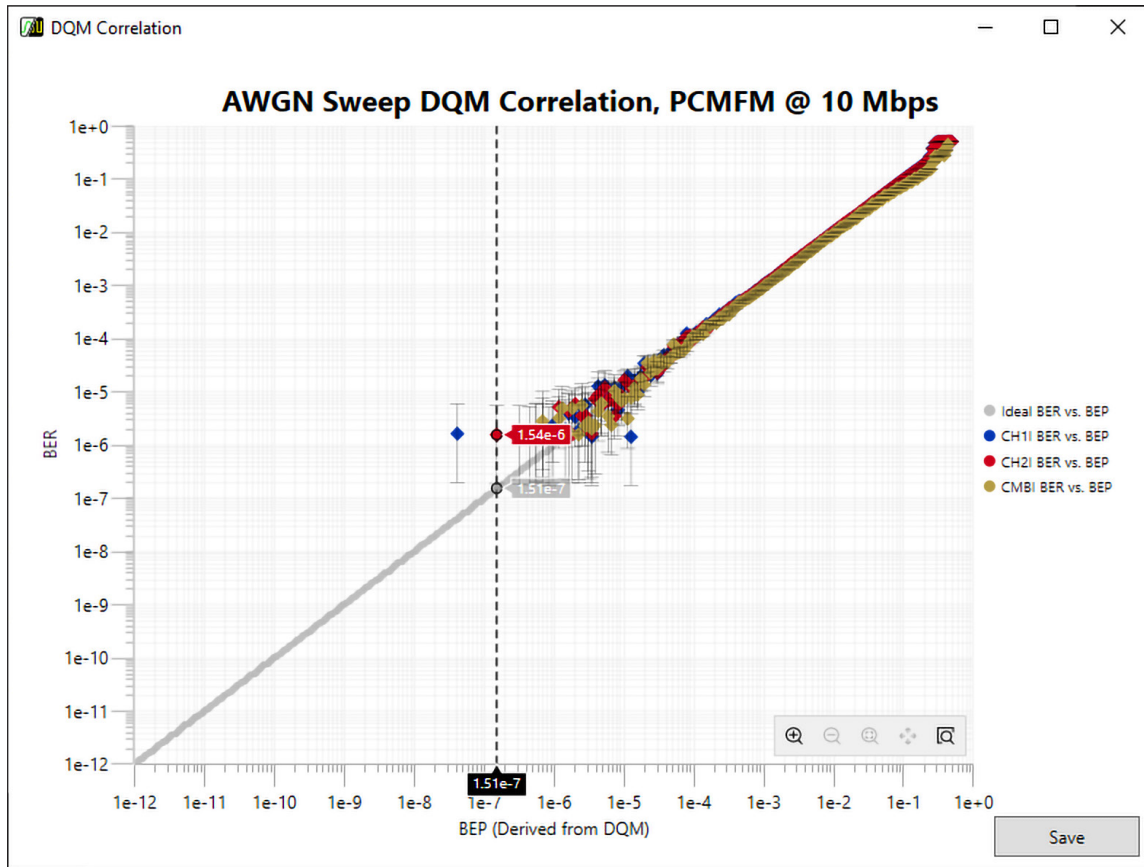info@instrumentation.it - www.instrumentation.it

Receiver Analyzer Performance

The Receiver Analyzer makes receiver characterization fast and easy. Automated testing allows precise measurement over many parameters and rapid acquisition of extremely large data sets. Saved data files facilitate result aggregation, analysis, presentation, and archival. From basic bit error rate performance to dynamic signal handling, such as acquisition time and combiner break frequency, the Receiver Analyzer will truly show how your receivers measure up. After you've calibrated receiver DQM, you can use estimated bit error probability in place of measured bit error rate to accelerate many performance tests by 100x or more.

The following charts show just a few examples of possible analyses you can run. All of these can be honed to your specific requirements with the Receiver Analyzer's user-customizable integrated graphics.

Receiver Analyzer Performance (Continued)

AWGN Sweep DQM Correlation, PCMFM @ 10 Mbps

AWGN Sweep DQM Distribution, PCMFM @ 10 Mbps

Receiver Analyzer Performance (Continued)

Sync Time Measurement, PCMFM @ 10 Mbps, 3 dB Eb/N0

Multipath Sweep BEP Measurement, PCMFM @ 10 Mbps
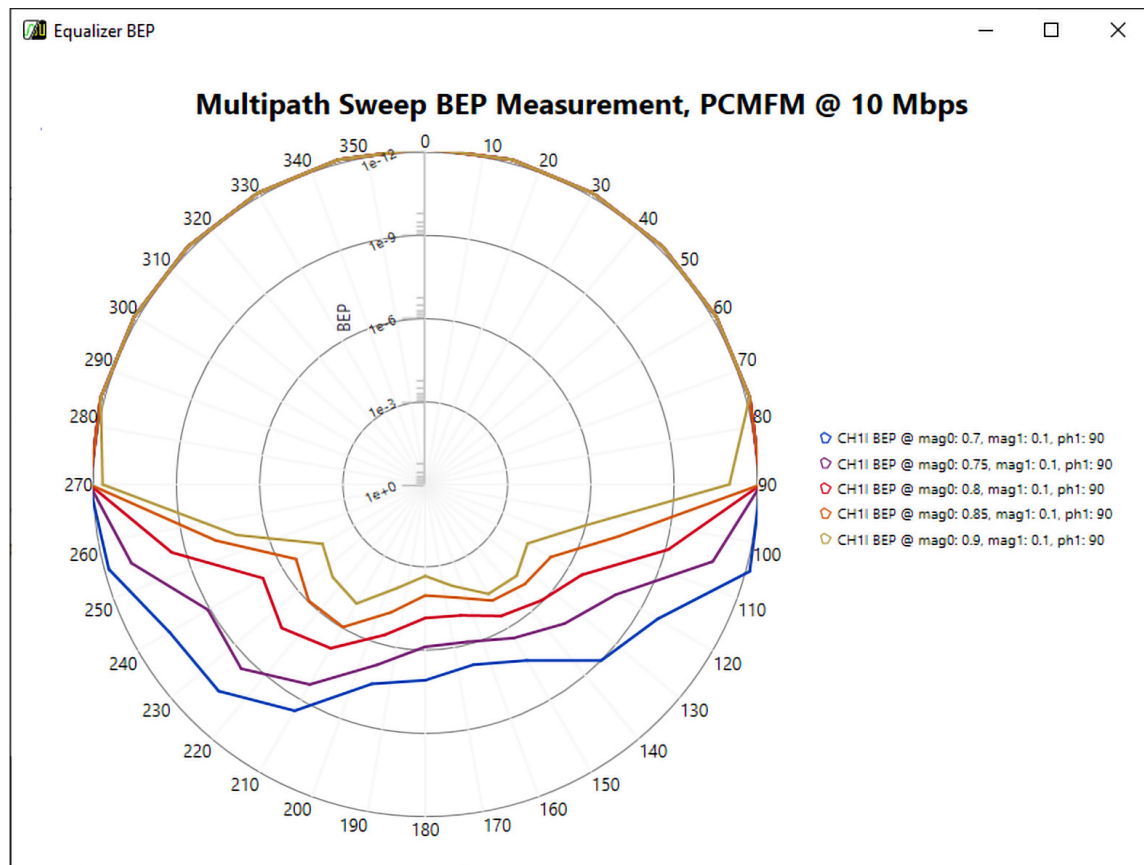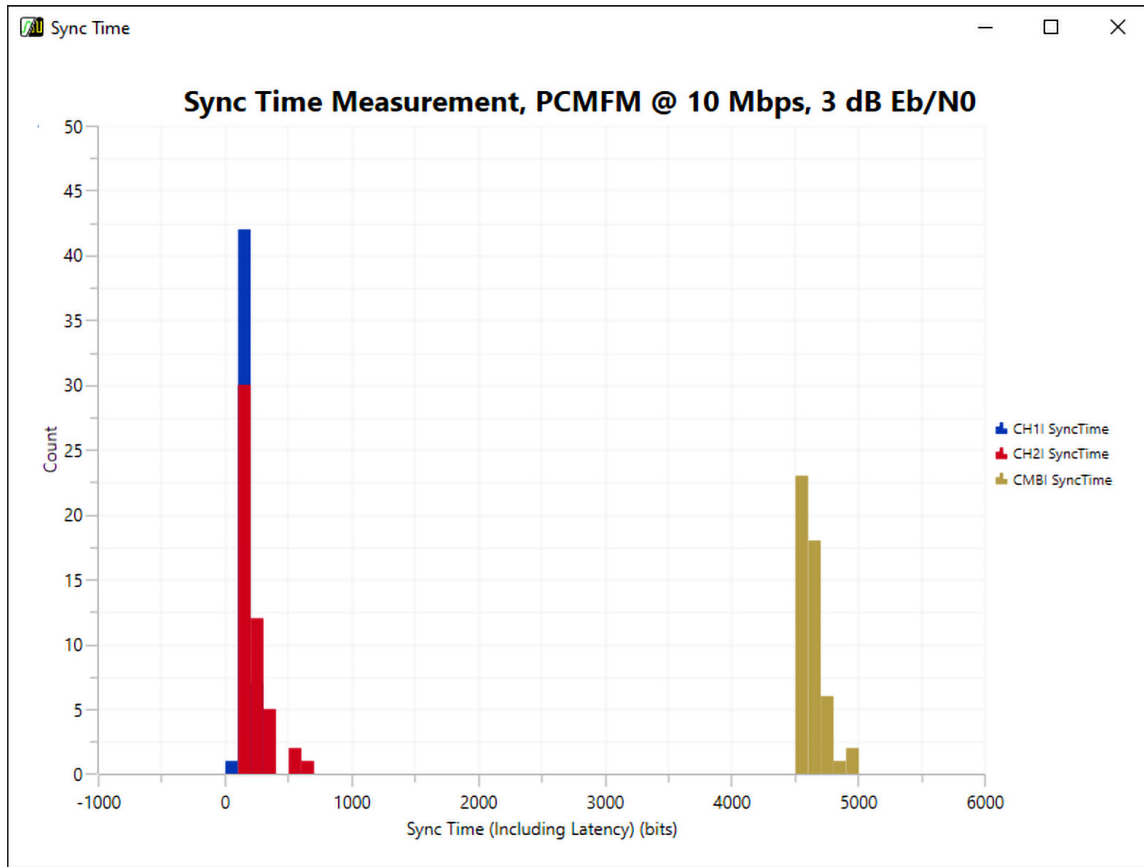
Receiver Analyzer User Interface

UI Features

RA3.0 completely re-writes the rules of the game. This new software core of the Receiver Analyzer unleashes even more of the hardware's power and allows far greater control in the setup of your testing. Here are some of the benefits:

- User-configurable layout with primary window and optional floating windows. Responsive control and status saves time and frustration. Put what you want where you want it on the screen, optimizing the configuration for the tests you're running.

- Easily save and load projects (settings plus layout), layouts, measurement scripts, and test results. Measurement editor to modify standard automated tests and create new ones.

- Measurement results displayed in configurable, interactive, real-time graphs, which can be saved as graphics files and restored from saved results files.

- Real-time status for all modules, including Modulator airlink data rate; DQE frame lock, frame count, estimated bit error probability (BEP), BEP bits, and BEP errors; and BERT bit error rate, elapsed time, bit count, error count, bit rate, errored seconds, and link availability measurements, plus data inversion, bit error, sync loss, and clock slip indicators for each channel BERT continuous, single, and repeat test modes, with configurable first- or last-to-finish termination across multiple channels.

- Vastly improved performance allows nearly real-time response.

System Requirements

Windows 10 or newer.

Examples

The following screen captures allow a glimpse of the potential of the UI configuration – from simple, focused setups to deep, detailed analyses.
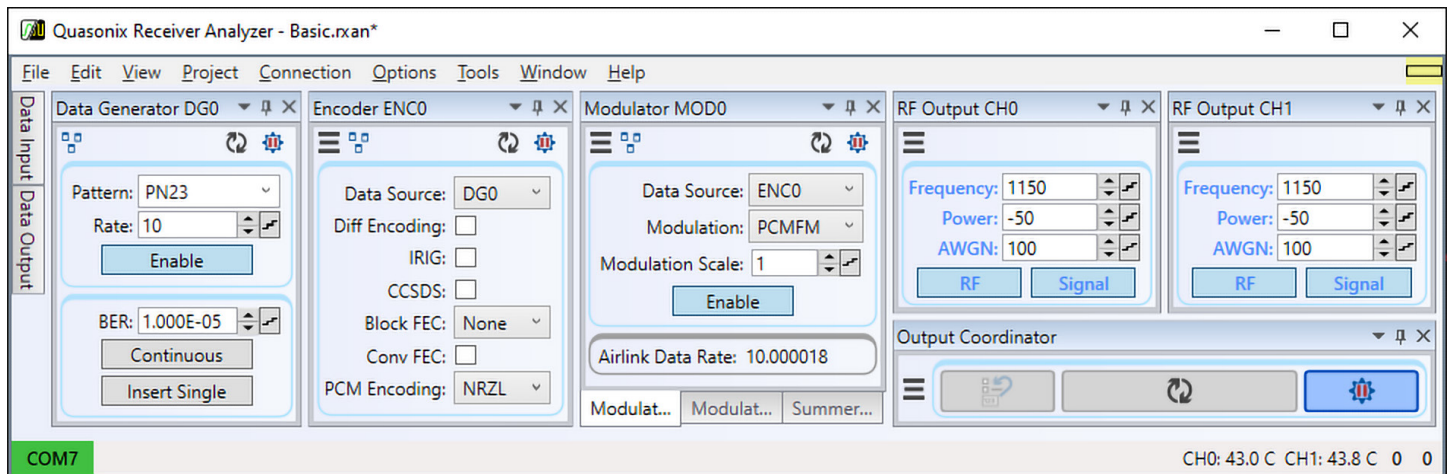
From basic functionality... To all the bells and whistles...
Select or create the UI layout that you need

Receiver Analyzer User Interface (Continued)

Rackmount Receiver Analyzer Specifications

Signal Generator

RF Outputs	2, can be slaved
Power Level	0 dBm to –125 dBm, default range (set in 0.1 dB steps)
Output RF Frequency	200.0-2500.0 MHz, tunable in 1 kHz steps 4400.0-5250.0 MHz, tunable in 1 kHz steps
Modulation Formats	PCM/FM, SOQPSK, MHCPM, Carrier, BPSK, QPSK, OQPSK, AQPSK, UQPSK, STC
Bit Rates	0.001 Mbps to 46 Mbps (mode dependent)
Coding Options	Convolutional, Reed-Solomon, or LDPC (per IRIG 106-22, Appendix 2-D) IRIG and CCSDS randomization NRZ-L/M/S, BIΦ-L/M/S, RZ, DM-M/S, M2-M/S Basic PCM framing (sync pattern 16 to 33 bits, minor frame up to 16384 bits, major frame up to 256 words, with subframe ID insertion)
Generator Functions	Modulation index scaling Multipath fading (synchronized out-of-phase between RF channels) Multi-ray multipath channel simulation Calibrated additive white Gaussian noise
Clock and Data In/Out	External user data: TTL on BNC connectors Patterns: Mark (all 1s), Space (all 0s), PN6, PN9, PN11, PN15, PN17, PN20, PN23, PN31, USER (2 to 32 bits)

Receiver Input/Status Output

Clock and Data In	TTL (BNC) Supports up to eight (8) clock and data input pairs from receivers, demodulators, etc.
Input Codes	NRZ-L
Lock Detector Out	TTL (HDB-15)
RF On/Off Control Out	TTL (HDB-15)

Environmental

Operating Temperature	0°C to +50°C
Storage Temperature	0°C to +70°C
Operating Humidity	0 to 95% (non-condensing)
Altitude	Up to 30,000 ft.

Physical

Size	1U rack-mount chassis; 19" wide, 1.75" tall, 14-5/16" rack depth, 15-11/16" overall depth
Weight	12.0 lbs
Connectors – per RF Channel	RF Out: N female CH1/CH2 I Clock, Q Clock, I Data, Q Data in: BNC female Combiner/BSS I Clock, Q Clock, I Data, Q Data In: BNC female Status Out: DB-15 High Density female
Connectors – per Chassis	TX Clock/Data In/Out: BNC female; USB-B for remote controlled user interface; AC power in
Power	25 W @ 120 VAC

Rack-Mount Receiver Analyzer Rear Panel Layout

Reinventing Telemetry™

With a razor-sharp focus on the aeronautical telemetry market and a team rich in talent, experience, and sheer determination, Quasonix is able to consistently design, develop, and manufacture what our customers regard as market-leading telemetry products.

Quasonix

All Quasonix products are under U.S. Dept. of Commerce jurisdiction. Transmitters are categorized as EAR99.two-antenna systems.
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