

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Visit our website - *Click HERE*

ACE™ MX MIMO Channel Emulator for Broadband Wireless

PRODUCT BRIEF

Comprehensive Test Platform for Assessing Product Performance in Multipath Environments

- The industry's only true MIMO channel emulator
- Satisfies the needs of multiple departments - research, engineering, and quality assurance
- Used by leading infrastructure, device and chipset vendors, operators, test labs & universities

Azimuth ACE MX
Wireless Channel Emulator
Best 2010
Wireless Test Solution

Test & Measurement World
BEST IN TEST
AWARD WINNER

The Golden Standard for MIMO Testing

Emerging carrier-grade 3G/4G wireless access promises speeds of 100 to 350 Mbps for delivery of high-speed data, video and voice services. High throughput delivery for LTE and WiMAX is achieved using orthogonal frequency-division multiplexing (OFDM) and advanced antenna techniques such as Multiple-Input, Multiple-Output (MIMO). MIMO performance depends on the radio channels in which it operates, and accurate and repeatable lab characterization of RF environmental effects such as multipath and fading is critical for reliable testing of conformance, performance and interoperability of the systems. Testing such conditions can only be achieved through the use of channel emulation.



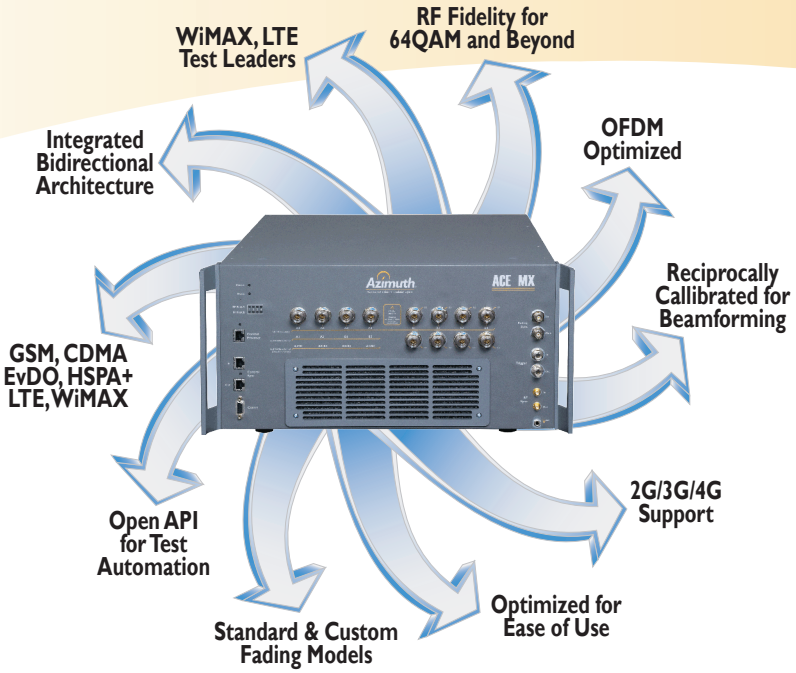
The ACE MX is a state-of-the-art channel emulator, purpose-built to support MIMO transmissions and architected to meet the demanding RF needs of OFDM based systems. The ACE MX product line combines industry-leading channel emulation capabilities in a comprehensive design to deliver a range of configurations for MIMO and/or SISO system testing, with uni- and bi-directional configurations.

The Azimuth ACE MX delivers:

- Rapid Set-up and Automation
- Unparalleled Ease-of-Use
- Unmatched RF Performance and Fidelity
- Superior Scalability and Flexibility
- Outstanding Value

ACE MX Detailed Overview

The ACE MX uses advanced signal processing technology to perform real-time lab emulation of a multipath fading environment as well as supporting real-time data streaming to playback field recorded conditions. The ACE MX scales from testing single channel SISO devices up to MIMO 2x2, 4x4 or even up to 8x4 devices. The ACE MX is also optimized to support bi-directional channel modeling that can accurately emulate real world wireless over-the-air conditions in both the downlink and uplink paths simultaneously in a single enclosure.



Built with ease-of-use in mind, the ACE MX is a complete test solution with all the required RF components included internally, thus eliminating the need for external hardware to connect and configure complex test topologies. This simple RF-in/RF-out design, combined with an intuitive graphical user interface, makes set up, configuration and test execution quick and easy.

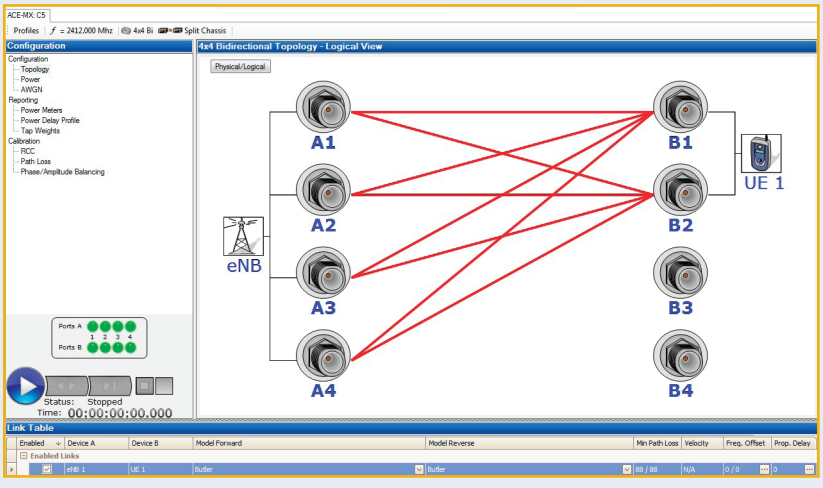
Designed to support 2G/3G, LTE, WiMAX and 802.16m next generation broadband wireless technologies, the channel modeling features of the ACE MX enable industry standard channel models or custom designed models to be loaded and run on the real-time dynamic digital signal processing engine.

The ACE MX is designed for automated test together with the Azimuth DIRECTOR II Test Executive. DIRECTOR II provides a comprehensive GUI to configure and control the channel emulator's parameters as well as offering full script control through a TCL API for automation or remote control.

The ACE MX is the most scalable solution available. Its modular hardware and flexible software design enable single and multilink MIMO configurations, support for TDD or FDD transmissions. and Uni or Bi-directional fading requirements. The ACE MX is ideally suited to support point to multipoint configurations for testing the performance of features like handoff, interference, multicast/broadcast or collaborative links.

DIRECTOR II Test Executive

DIRECTOR II Test Executive is a flexible software management tool that provides centralized control over Azimuth test platforms including the ACE MX. An intuitive user interface allows users to configure and manage the ACE MX as well as nodes in the network. DIRECTOR II supports advanced scripting automation of the ACE MX allowing the user to run manual tests or completely automated test scripts.



Testbed Manager

Provides the user with a common, centralized interface to control and manage all the test bed devices within this test environment. Testbed Manager includes the ability to configure and operate the ACE MX as well as advanced tools for saving test profiles, custom models, and importing and exporting all parameters for use on similar systems.

The ACE MX and DIRECTOR II provide an open API providing full control of every function of the ACE MX to be configured and used from a TCL script or from a remote 3rd party test automation application. The automation API enables simple integration of channel emulation into test beds and test suites.

Designed for Usability

The need for channel emulation in many standardized tests for compliance, performance, interoperability and functionality puts the ACE MX in the hands of novice as well as expert users. So while still providing advanced capabilities to the user, the ACE MX user interface is keenly focused on providing a user experience which will make test setup and operation extremely easy.

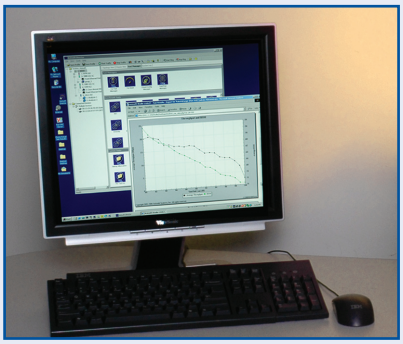
All RF Included - the ACE MX includes both uplink and downlink paths inside the unit including all RF connections. This simplifies the setup and calibration process and ensures that RF specifications are maintained for the end-to-end test configuration.

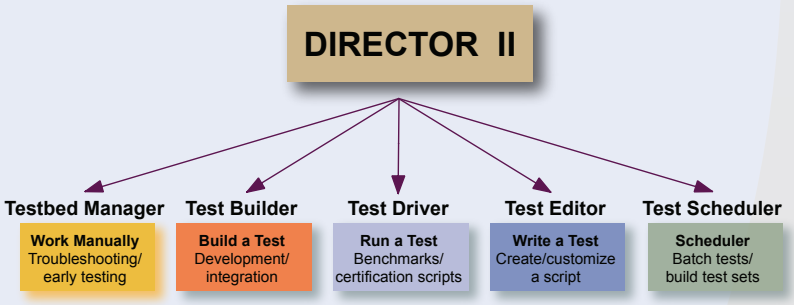
Easy-to-Use GUI - user friendly and intuitive setup tool provides full access and configuration of the links between devices. The GUI requires only 4 steps from power on to full operation and allows more complex configurations to be stored in configuration profiles.

Simple Automation - the real value of test equipment is achieved when the system functions with minimal interaction and implements hundreds of test cases using script automation. The ACE MX and Director II API support scripting. The entire unit can be easily configured using test profiles, standard or custom models and intuitive libraries.

Self Calibration - this end-to-end system requires no field calibration for standard operation. Advanced testing with multiple units or phase/amplitude balance for beamforming can be simply and quickly calibrated using wizard-guided calibration procedures.

Features	Benefits
MIMO channel emulation up to 8x4	Scalable architecture tests multi antenna functions like spatial multiplexing, Tx and Rx diversity, collaborative uplink and multicast/broadcast under diverse RF conditions
Unrivaled RF performance	Quality test tool provides the EVM and SNR to support testing for 64QAM and beyond
Complete modular architecture	Scalable solution that can be used for unit test through to complex full system testing makes resource planning, training and test configuration simpler
Dynamic bi-directional channel modeling	Recreates real world conditions by emulating dynamic channel conditions in both the downlink and uplink paths simultaneously, enabling applications such as FDD emulation and beamforming
GUI-based configuration with advanced user control	Fast forward, rewind, play and pause commands allow the user to evaluate specific channel conditions in an instant without waiting for lengthy emulation runs
Custom channel builder utility	Gives users the ability to program the ACE MX with user-defined MIMO channel models for increased test flexibility
Outstanding value	ROI built in - flexible scalable hardware and software ensures best short term and long term value for your investment





Azimuth DIRECTOR™ II Test Executive Software enables users to:

- Improve operator efficiency through a simple, centrally managed console to control, configure and operate the ACE MX channel emulator
- Automate the ACE MX and test process with the advanced TCL automation interface or through an open API to a remote 3rd party automation tool
- Increase test flexibility by leveraging automation and control libraries of the channel emulator and other devices
- Provide tests to speed time-to-market by finding issues earlier in the development cycle
- Create automation to shrink test cycles and execution time and make better use of data by sharing it across development organizations and partners

Channel Emulation Specifications

Max Number of Channels	Scalable from 4 to 64 channels
Taps per Channel	20 > 24*
Channel Models - Model Packs:	Industry standard models such as: - IMT-A Model Packs - SCME-Advanced Model Pack - Custom GSCM Geometric Channel Models - WiMAX Forum Channel Models based on ITU M.1225 - 3GPP SCM Channel Models (Spatial channel model for Multiple Input Multiple Output (MIMO) simulations) - 3GPP/3GPP2 GSM/CDMA/3G Channel Models (SISO Models from the 3GPP and 3GPP2 for GSM, CDMA, EDGE, HSPA etc.) - 3GPP LTE Channel Models - SCME Channel Models for link level Extended SCM Models - High speed train model scenarios - Birth/death and moving propagation scenarios
- Custom Model mode	User friendly interface to program new or edit existing channel models
- Bypass mode (identity matrix)	no correlation, no fading, no multipath
- Butler mode (Butler matrix)	no correlation, no fading, no multipath
Maximum Doppler Shift	2 kHz (>500 km/hr @ 3.6 GHz)

Note: Specifications are preliminary and subject to change.
8xX configurations supported from 450 - 2700MHz.
* with corresponding s/w release.

RF Specifications

RF Input Frequency	450 - 2700 MHz 3300 - 3800 MHz 4900 - 5900 MHz
Center Frequency	Tunable in 10 KHz steps
Bandwidth	50 MHz
Input Signal Level	+15 to -40 dBm
Crest Factor	15 dB
RF Attenuator Range	75 dB
RF Output Power Peak	-5 to -118 dBm
Residual EVM (Error Vector Magnitude)	< -40 dB typical With 10 MHz OFDM Signal Input power = -10dBm Output power = -43dBm
Output Noise Floor	< -166 dBm/Hz
Additive White Gaussian Noise (AWGN) SNR setting - Resolution - Crest factor	 -30 to +35 dB 0.1 dB 10 dB

Physical Specifications

Dimensions	9.25" H x 17.45" W x 28.5" D (0.24m H x 0.45m W x 0.73m D)
Weight	~58 lbs. (~24 kgs)
Power	100 - 240 VAC, 50-60 Hz, 4.0/2.0 Amps

ACE MX Configurations

Test Configurations	- 1x1, 2x2, 2x1/1x2, 4x4, 4x1/1x4, 4x2/2x4, 8x1/1x8, 8x2/2x8, 8x4/4x8 - Uni-directional and bi-directional - SISO, SIMO, MISO, MIMO - Calibrated for beamforming - Point-to-point and point-to-multipoint (Handoff) - Single and multilink capable

Corporate Headquarters

Azimuth Systems, Inc.
35 Nagog Park
Acton, MA 01720 USA

Phone: +1. 978. 263. 6610
info@azimuthsystems.com
www.azimuthsystems.com

For regional contacts go to:
www.azimuthsystems.com/regional_contacts.htm

Azimuth ACE MX
Wireless Channel Emulator
Best 2010
Wireless Test Solution
Test & Measurement World
BEST TEST
AWARD WINNER

©2010 Azimuth Systems, Inc. All rights reserved. All specifications subject to change without notice. Azimuth, the Azimuth Logo, Azimuth DIRECTOR, testMAC, SmartMotion, Real2Real, STUDIO, and RadioProof are trademarks of Azimuth Systems, Inc. All other trademarks are the property of their respective holders.

PB_ACEMX_MIMO_0911

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP