



# TEST & MEASUREMENT SOLUTION (XCAT) enables base station management, construction, test and maintenance

It is a solution for 5G and 4G Base station management, construction, test and maintenance.

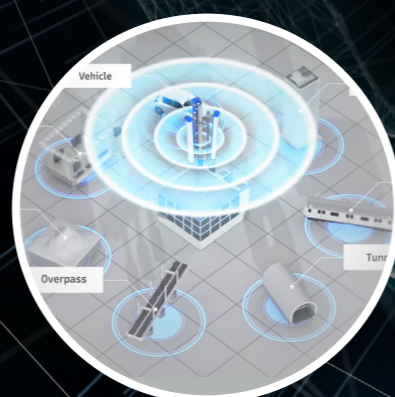
## Cell Site Maintenance



## Lab Automation



## Load and Capacity Test



## Load and Capacity Test

XCAL-MTS

Lightweight and portable Test & Measurement solution for base station measurement and maintenance

- Portable & Lightweight
- Easy to Use
- Cloud based Monitoring Feature

Test Solution that allows the user to test and optimize the network without having to go to the field by configuring the actual wireless environment of the field in the Lab

- Field test Environment in the Lab
- Automated Test Results
- Cost effective Solution

Load & Capacity Test of Base station through multiple device connection

- System Test
- Stress Test
- Regression Test

## Cell Site Maintenance

XCAT-CAN

XCAT-IXA

## Lab Automation

XCAT-MAIS

XCAT-Smart Shield

XCAT-AIS C

## Load and Capacity Test

XCAL-MTS



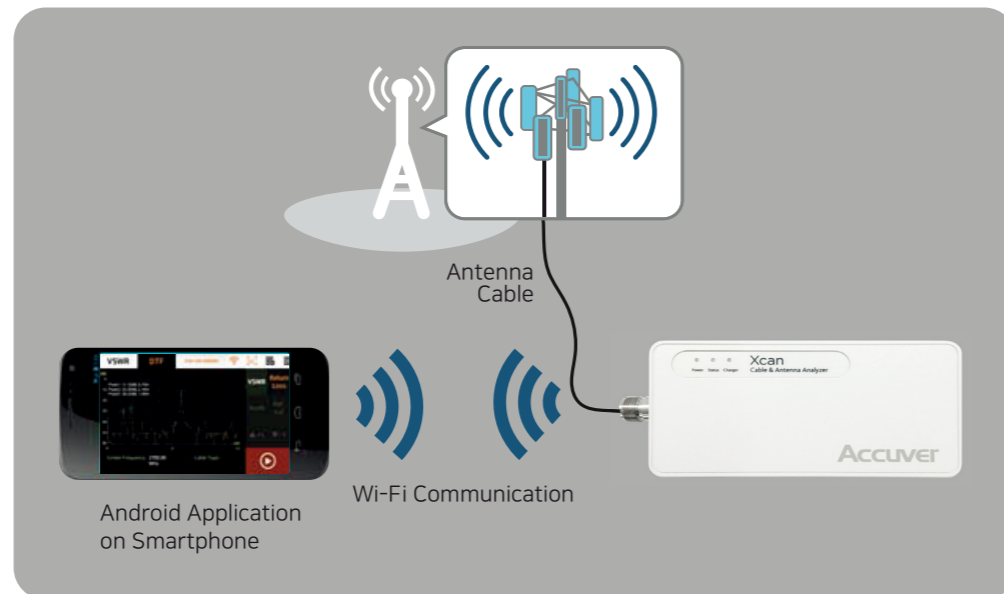
# XCAT-CAN

Cable and Antenna analyzer for accurate measurement

XCAT-CAN is a handy solution for maintaining and troubleshooting wireless communication test sites. Designed for the convenience of field engineers, it combines cable and antenna analyzers in one device. XCAT-CAN supports various measurements including VSWR/Return loss, DTF, and CWG. With its lightweight and portable design, field engineers can easily carry it wherever it's needed. Utilizing state-of-the-art measurement technology, XCAT-CAN enables fast and highly accurate measurements.

### Features

- \* Wide frequency range
- \* Fast and highly accurate measurement
- \* Very light and compact design
- \* Immediate diagnosis and troubleshooting
- \* Easy to operate and convenient to use
- \* Simple upgrade by S/W download
- \* Rechargeable battery operated
- \* USB interface for Wi-Fi dongle and host communication



Item	Specification
Frequency range	650MHz ~ 3.8GHz
VSWR range (resolution)	1.01 ~ 65.00 (0.01)
DTF Max. measurement range	500m (Max Loss 50dB)
Connector Type	N Type (Female)
Connection	Wi-Fi, USB
GUI	Android device
Battery capacity	3,200mAh
Calibration	Open, Short, Load
Size	80 x 196.7 x 20.2 (mm, W x H x D)
Weight	510 g

# XCAT-IXA

Cloud based portable spectrum analyzer

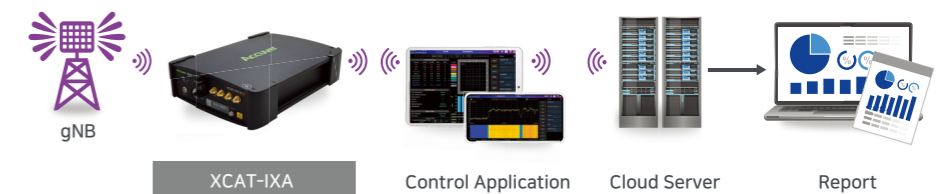
XCAT-IXA is a portable real-time spectrum analyzer that supports General Spectrum Feature, PCI Scanning Feature, and Multi-Viewer Feature. With a separate display, XCAT-IXA enables seamless connectivity to any Android device, which can serve as a display and controller. This advanced solution integrates with a cloud server, providing autonomous measurement capabilities. XCAT-IXA provides an opportunity to reduce OPEX and CAPEX across the network lifecycle, from deployment to maintenance and upgrades, by eliminating upfront equipment costs and staffing expenses.

### Features

- \* High portability
- \* Easy to use
- \* Upload measurement result to cloud server and monitor it through Remote PC in real-time
- \* PCI scan of neighbor cell
- \* Minimize human error by automated measurement
- \* OTA(Over the Air) measurement

### Functions

- \* Spectrum Analyzer  
: Spectrum / Channel Power / OBW / ACLR / SEM / SE
- \* Modulation Analyzer  
: 5G NR : Constellation / Error Vector / Multi View / SSB Location Auto Search  
: LTE : Constellation / Error Vector / MQS  
: WCDMA : Code Domain Power / Modulation Accuracy
- \* PCI scan (5G NR + LTE)
- \* Autonomous measurement (5G NR, LTE, WCDMA)
- \* Application in the Tablet PC (Android OS)
- \* Cloud SA management: Interoperable with cloud server (Optional)



**Powerful Performances**

- Base station Conformance test
- 5G Signal Analysis  
- Constellation  
- UL/DL Multi view
- PCI Scan

Spec Item		XCAT-IXA 1x C	XCAT-IXA 2x C
Frequency	Operating Frequency	300KHz~7.5GHz	9KHz~20GHz
Exterior	Exterior		
	Type	Separate display	Separate display
	Tablet S/W	Same	Same
	Weight	1.54 kg	3.4kg
	Size	W105.8xH51xD255.5 mm	W190.0xH65.5xD267.6 mm
Battery	Operating time	1 hrs 30 min	3 hrs 50 min
Frequency Reference	AgingRate/Year	± 0.5 ppm/Year	± 0.5 ppm/Year
Sweep	Mode	Sweep & FFT (Hybrid)	Sweep & FFT (Hybrid)
Bandwidth	Demd. BW	~ 100MHz	~ 100MHz
	SSB Phase Noise (@ 1GHz, 100 kHz offset)	-101.2 dBc	-101.2 dBc
Amplitude	Measurement Range	DANL ~ +20dBm	DANL ~ +20dBm
	Amplitude Accuracy	±1.3dB (±0.5 dB typical)	±1.3dB (±0.5dB typical)
	Dynamic range	> 106 dB @ 3.5GHz	> 110 dB @ 2.4GHz
	Second Harmonic Distortion (@ 4 GHz)	<-70dBc typical	<-70dBc typical
DANL (@ 4 GHz)	Pre-amp OFF	-144dBm typical	-147dBm typical
	Pre-amp ON	-161dBm typical	-162dBm typical

# XCAT-MAIS

Massive MIMO air interface simulator

XCAT-MAIS is a leading air interface simulation solution that allows engineers to replicate realistic radio wave propagation in laboratory environments. Its system architecture is fully scalable and flexible, with individual phase and amplitude adjustment per path, replicating the wireless channel environment of UEs. XCAT-MAIS offers various real-world test scenarios such as fading, path loss, mobility, and M-MIMO simulations. The operator can simulate complex field tests in the lab using XCAT-MAIS.

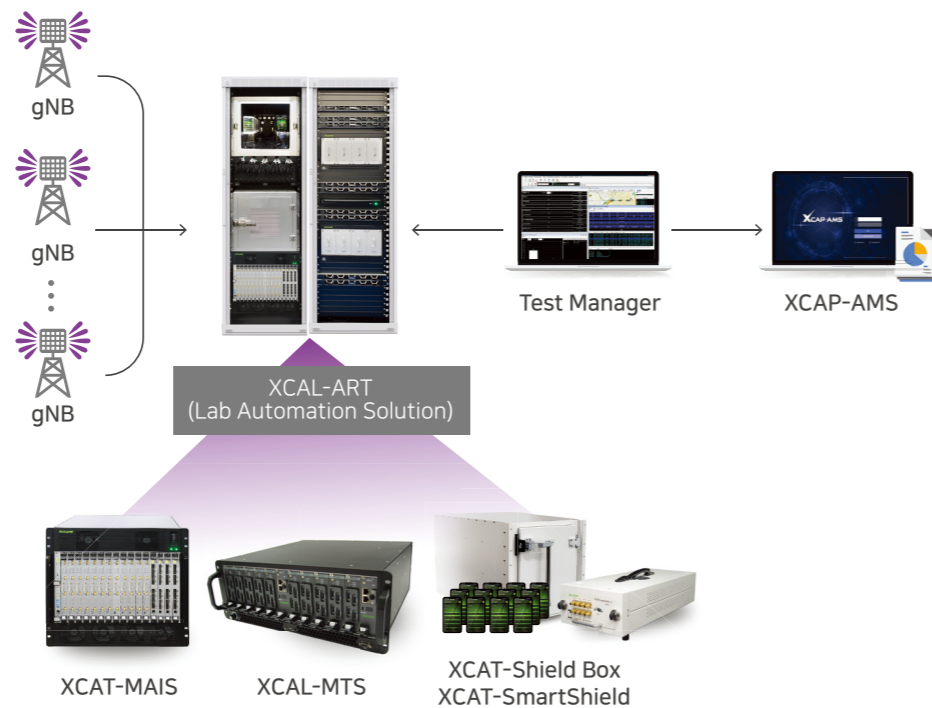
XCAT-MAIS can be seamlessly integrated and utilized as a Lab Automation Solution (XCAL-ART) in conjunction with other Accuver solutions, including XCAL-MTS, XCAT-SmartShield, Test Manager, and XCAP-AMS.

### Features

- \* Automated self-calibration for CR satisfaction (5G)
- \* User-adjustable amp/phase
- \* Monitor BS/UE inputs & outputs at each RF port
- \* User-defined scenarios and associated channels
- \* Automatic/manual call set up
- \* Selectable KPI logging and in-depth Analyzer
- \* Easy & simple system expansion by adding slot cards

### Functions

- \* Support latest wireless technology
  - : 5G, Massive-MIMO, Beamforming
- \* Simulate various test environment
  - : Scattering, Reflection, Diffraction simulation by Multi-path fading channel
- \* Distributed lab environment
  - : With MAIS, BS and UE don't have to be co-located, allowing international users to log in and access system resources at any time



Title	Spec.
Frequency	300 ~ 6,000MHz
Channel Bandwidth	100MHz
Insertion Loss	0dB
Path Loss control	0 ~ 89.5 dB, 0.5 dB step
System Delay	3.1 us
Calibration tolerances	$ \Delta\text{Amplitude}  < 0.35 \text{ dB}$ , $ \Delta\text{Phase}  < 3 \text{ degree}$ using external calibration hardware
RF Interface	Scalable by 4, up to 64 per chassis, TRX port
Max. power	+0 dBm (CW) per RF port (input/output)
Channel Models	ITU Ped. A/B, Veh. A/B, EPA, EVA, ETU, HST, 2D/3D SCM
Multi-path	8 per connection, each ranges from 0 to 25 us
Doppler Frequency	Up to 450 Hz (1350 Hz for HST)

# XCAT-SmartShield

Shield box solution with Over-The-Air technology applied for MIMO testing

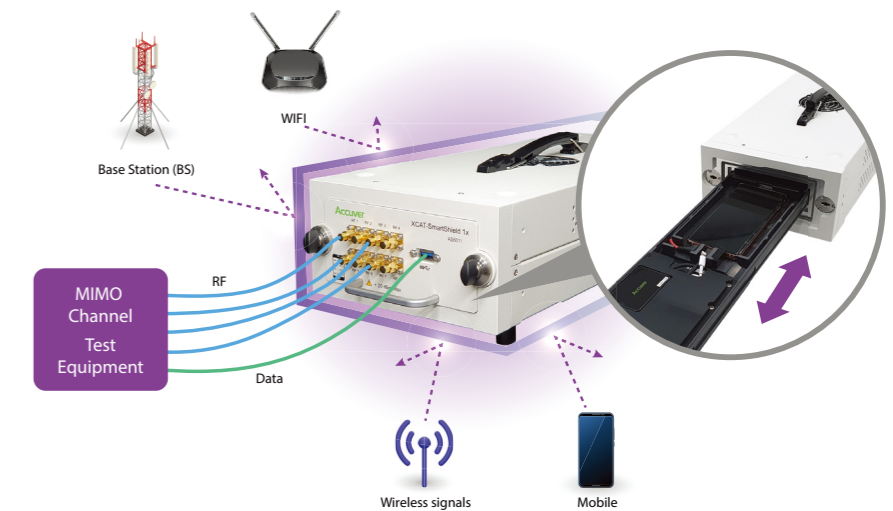
XCAT-SmartShield offers an advanced shielding solution for precise RF testing of single UE. It ensures accurate maintenance of the UE's RF environment as specified by the Test Manager. With XCAT-SmartShield, you can achieve a 1-to-1 connection between base station (BS) and user equipment (UE) antennas in a lab area. It transmits a reference signal through probe antennas and measures RSRP in a field MIMO environment. With the increasing trend of UEs lacking externally accessible antenna connectors, XCAT-SmartShield simplifies the process by providing a virtual 1-to-1 wireless connection between the base station and the UE.

### Features

- \* Accurate measurement without external interference with excellent shielding performance
- \* Minimize OTA (Over the Air) connection loss by applying near-field coupling method
- \* Reliable MIMO testing with reduced cross-talk between antenna ports
- \* Easy smartphone installation and minimal change in characteristics due to installation
- \* Built-in MOS test module

### Functions

- \* Support Sub6 and mmWave (up to 40GHz)
- \* Smartphone Test without external antenna connector
- \* No interference from outside (Isolation > 60dB)
- \* Support long time 5G NR test



Item	SmartShield 1x G2	SmartShield 4x G2
Frequency Range	Up to 6 GHz	Up to 40GHz
RF ports	8 ports (SMA female)	12 Ports (2.92mm female)
Connection loss	< 20 dB	< 30 dB
Cross-talk	< -20 dB (Support the cross-cancelling)	TBD
Shielding Performance	> 60 dB	> 60 dB
Max Input Signal Level	+ 20 dBm	+ 20 dBm
Smart functions	Cross-talk cancelling (with MAIS)	Cross-talk cancelling (with MAIS)
	Maximum Received Signal Power	Maximum Received Signal Power
Dimensions	196 x 101 x 500.8 (W x H x D, mm)	220 x 137 x 526.2 (W x H x D, mm)
Acceptable UE Size @ max	180 x 95 x 11 (W x H x D, mm)	180 x 95 x 11 (W x H x D, mm)
Weight	9.3 kg	12.4 kg



# XCAT-AIS C

## Compact Multi-Cell / Multi-UE Air Interface Simulator

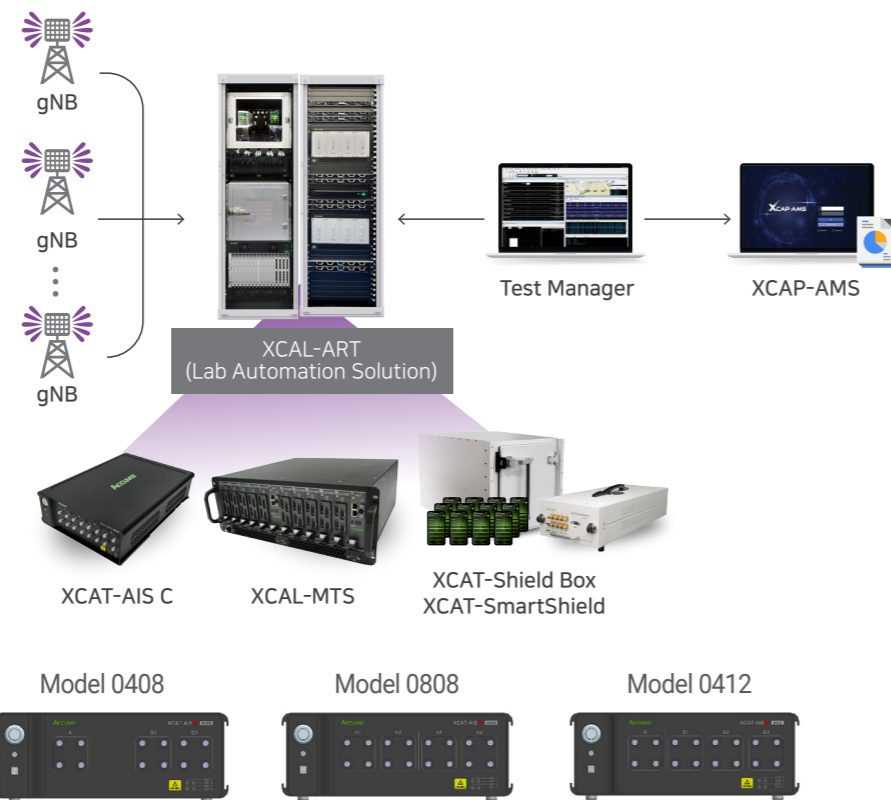
XCAT-AIS C is a compact channel emulator used to verify and evaluate the performance of various air interface technologies. Its compact design enables convenient testing and monitoring in any location, thanks to its portability and easy installation. This digital attenuator supports multiple models and operational modes, making it adaptable to a wide range of testing scenarios.

### Features

- \* Supports 4x4, 2x2, and 1x1 port configurations for single and multiple antenna testing.
- \* Supports Normal Mode and Reverse Mode for various testing environments.
- \* Supports an attenuation range up to 90dB, facilitating various tests.
- \* Compact configuration for easy installation and mobility.
- \* Easy scenario manipulation with a GUI-based Test Manager.
- \* Provides API and SCPI for diverse control functions.

### Functions

- \* Support signal attenuation test.
- \* Support Handover test.
- \* Support Link Budget test.



Title		Spec.
Frequency		600 ~ 6,000 MHz
RF Signal Input Range		< +20dBm
Attenuation Range		< 90dB
Minimum Step Size		0.5dB
Minimum Setting Time		< 0.5s
Power Consumption		9V / 200mA Below
Size		216 x 82 x 310.3 (W x H x D, mm)
Weight	0808	4.5 kg
	0408	5.0 kg
	0412	6.5 kg

# XCAL-MTS

## Real UE based Load & Capacity Testing Solution up to 40 UEs

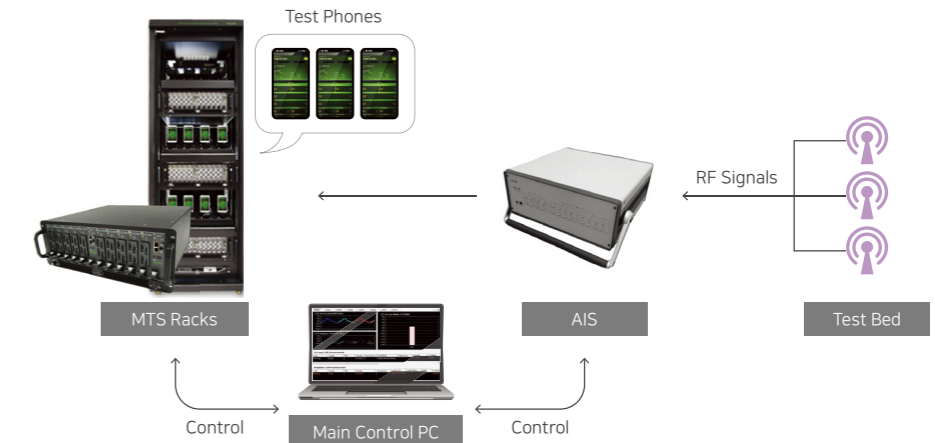
XCAL-MTS is specifically designed for load and capacity testing, supporting up to 40 simultaneous UEs connectivity. This powerful tool empowers users to troubleshoot, analyze, and benchmark wireless network environments. With its intuitive GUI, XCAL-MTS offers various types of connections specialized for system verification. This innovative solution provides a user-friendly interface with features like customizable graphs, message filtering, and visible and audible alarm indications. It enables users to monitor and identify problems in real-time, ensuring optimal network performance.

### Features

- \* Support various wireless communication test including 5G NR
- \* Support up to 30 UE benchmarking test simultaneously
- \* Scalable by Rack mount
- \* Control multiple XCAL-MTS S/W via Test manager

### Functions

- \* Load & Capacity test with multiple UE
- \* Field Test simulation in LAB environment by interworking with XCAT-MAIS
- \* Measure various application including Layer 1, 2, 3
- \* QoE (Quality of Experience) Measurement
- \* Support Autocall and MOS Test
- \* Display Voice/Data quality test result and RF information in real-time



Item	Specification (per shelf 1EA)
Power Input	AC(100V~240V, 49~61hz)
Power Consumption	Max. 1000W
CPU	Intel Core i7-7600U (Kabylake)
Memory	16GB
SSD	512GB
OS	Windows 10
OS Recovery	Supported
External Interface	I-Gbps Ethernet x 2 (per Section)
Phone Interface	USB 6-ports USB 3.1(Gen2) 3A, 5V (Max.)
Size	483 x 133 x 256 (W x H x D, mm)
Weight	14.5kg