MTS Systemtechnik

Innovation Meets Precision:
Electronics Manufacturer for RF Technology

Premium Partner for Tailored Test Solutions
Meeting the Highest Requirements in
Mobile Communications, Automotive, and Defence
Development | Manufacturing | Service
Made in Germany



MTS Radio Field Emulations for mobile communication



Enables field tests on side

// Radio Field Emulation



Current Approach – OTA (Over-the-Air-Testing):

Basic development and functional testing are carried out by the manufacturer in accordance with the relevant specifications and standards. Integration and functional verification during active operation take place in OTA field tests. Only in this environment can range testing, cell handovers, interoperability, dynamic movement, and multi-user operation be assessed under real conditions. These tests involve considerable costs due to the provision of equipment, personnel, and space, and the time required is also significant.

// Radio Field Emulation AIAD



Procedure with the MTS AIAD Series:

With our AIAD systems, transmission scenarios, operating conditions, and fault cases observed in field tests can be reproduced beforehand. This is achieved by operating the radio entirely via cable connections rather than over the air. The propagation characteristics of a radio link are emulated using a network of RF components. From the radio's perspective, all objects appear to operate in free space, enabling a highly realistic laboratory test environment.

// Radio Field Emulation AIAD

Advantages

- // Any application, scenario, or fault case can be simulated in the laboratory.
- // Scalable participant (ports) count and flexible configuration options.
- // Minimal need for field testing, resulting in significantly shorter test cycles.
- // Direct connection of wireless devices with very high transmission power, including 10 W and above.
- // Easy attenuation of signal levels below the UE sensitivity threshold.
- // Vendor-independent, reproducible results.
- // Very wide frequency range from 50 to 8000 MHz (other ranges available on request), supporting the simultaneous use of multiple radio technologies.
- // Wireless devices without an RF connection can be placed in shielding boxes available in customised versions.

// Radio Field Emulation

Replace Obsolete Systems or Certify New Ones

Current Approach (Over-the-Air-Testing):

Functional tests are typically carried out on demonstrators or in reduced test environments that are customised and limited in scope.
Testing under real-world conditions with existing technology is seldom performed and, when it is, requires considerable personnel and material resources.
The challenges are similar to those encountered during development and system integration.

// Radio Field Emulation AIAD

Replace Obsolete Systems or Certify New Ones

Procedure with the MTS AIAD series:

The MTS radio field simulation systems enable the reproduction of any scenario, operating condition, or fault case in the laboratory.
New developments and legacy systems are connected to the network via RF cabling.
Different brands and device types can be exchanged quickly and easily.
Independent measurement of device and system specifications is also possible.

// Radio Field Emulation AIAD

Replace Obsolete Systems or Certify New Ones

- // Any scenario or known critical case can be easily reproduced.
- // New systems can be thoroughly tested in conjunction with real equipment.
- // Manufacturer-independent testing ensures objective results.
- // Field testing is required only for mechanical stress validation.
- // Validation time is significantly reduced.
- // Operational readiness is accelerated considerably.

// Radio Field Emulation AIAD

What AIAD Devices Are Used For

- For functional testing of mobile radio systems during product development.
- For certification of mobile radio components by network operators.
- For reproducing critical cases during development and integration.

Possible Radio Standards Include

- Mobile radio (2G, 3G, 4G, **5G**), IoT, C2X, Wi-Fi, TETRA, and
- Military radio technology in the frequency range of 30 - 1000 MHz

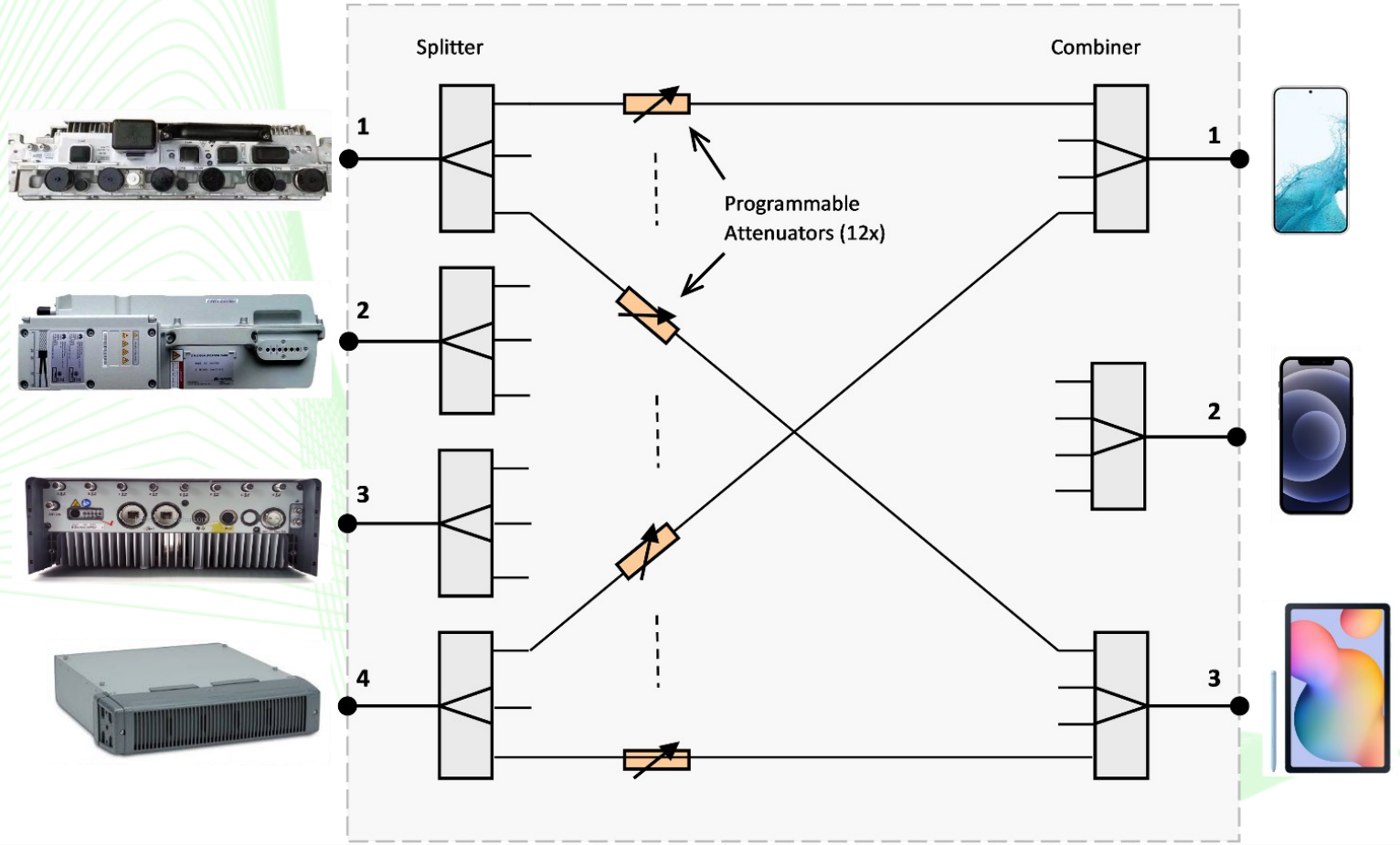
// Radio Field Emulation AIAD

Features of AIAD Devices

- A programmable attenuator is integrated into each path of the radio field emulation.
- Standard attenuation range: 0–95 dB in 1 dB steps.
- Extended range: 0–122 dB, e.g., for IoT applications.
- Switching between attenuation levels is continuous and interruption-free.
- The selected attenuation is identical in both uplink and downlink directions.
- Alternatively, partially meshed or unbalanced network configurations are possible (e.g., only two neighboring cells can be addressed at a time, or only two ports are connected to all others).

// Radio Field Emulation AIAD

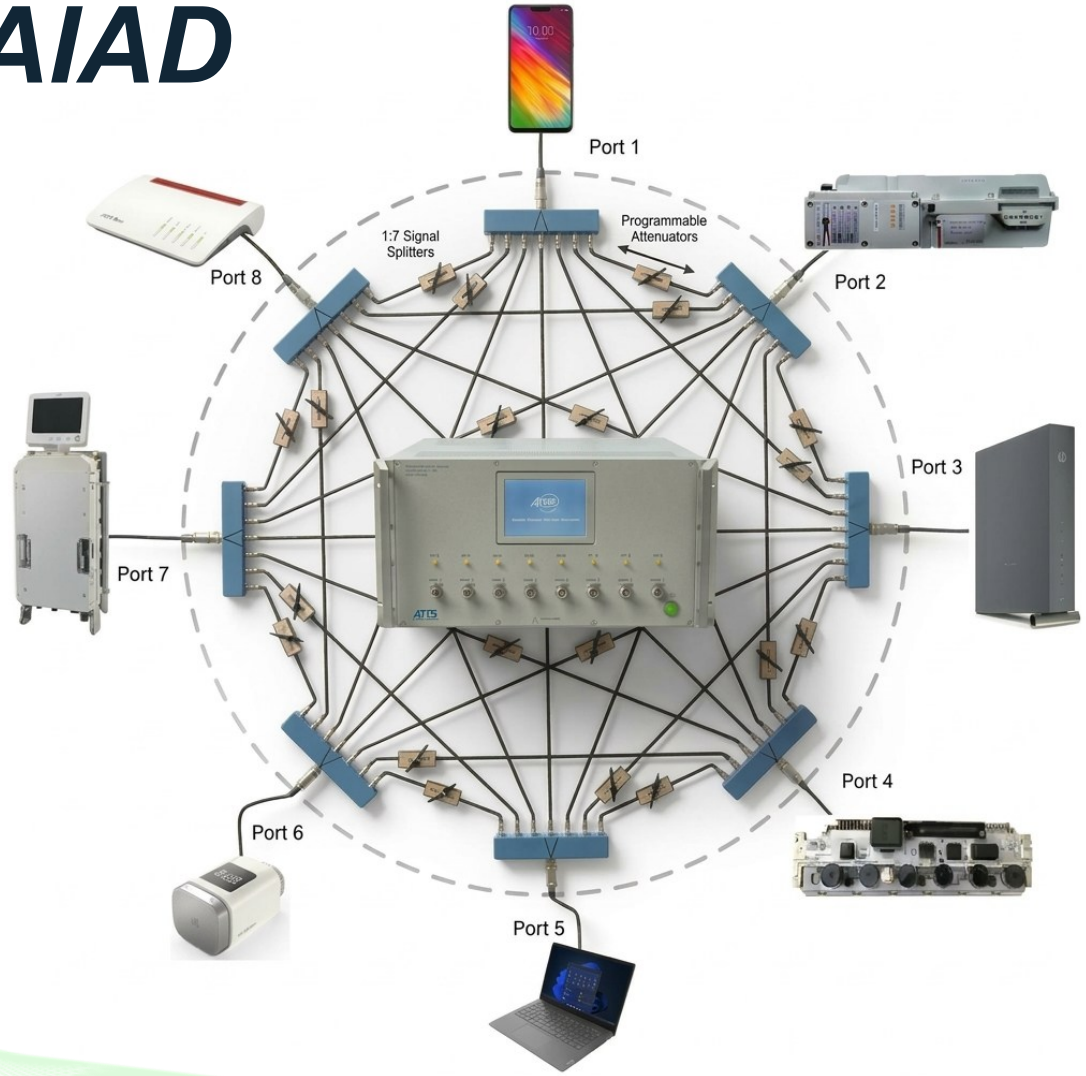
Example AIAD Configured with 4 inputs and 3 outputs



// Radio Field Emulation AIAD

Example AIAD+ Configured with 8 ports

- // Ring topology as shown in the block diagram.
- // Fully meshed inputs in all directions.
- // Supports communication between UEs.
- // Number of connections configurable based on customer requirements.



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Summary

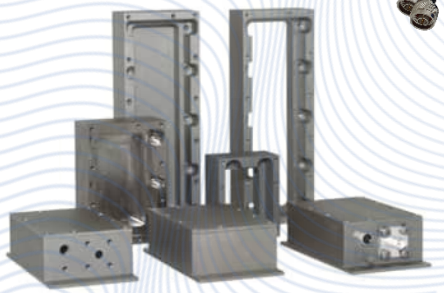
With AIAD system solutions, any state of a radio link can be modelled dynamically. This enables realistic testing of radio systems or components under live operational conditions. Reliable, reproducible, on-site.

We bring the wireless environment to your laboratory

// Accessory

- // RF components
- // Shielding boxes series MSB
- // Shielded racks series SRK
- // Installation service
- // RF cable assembly
- // Mechanics











Other configuration possible on request!

// Main customers



MTS Systemtechnik

// *Let's find the right solution together – contact us*

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