MTS Systemtechnik

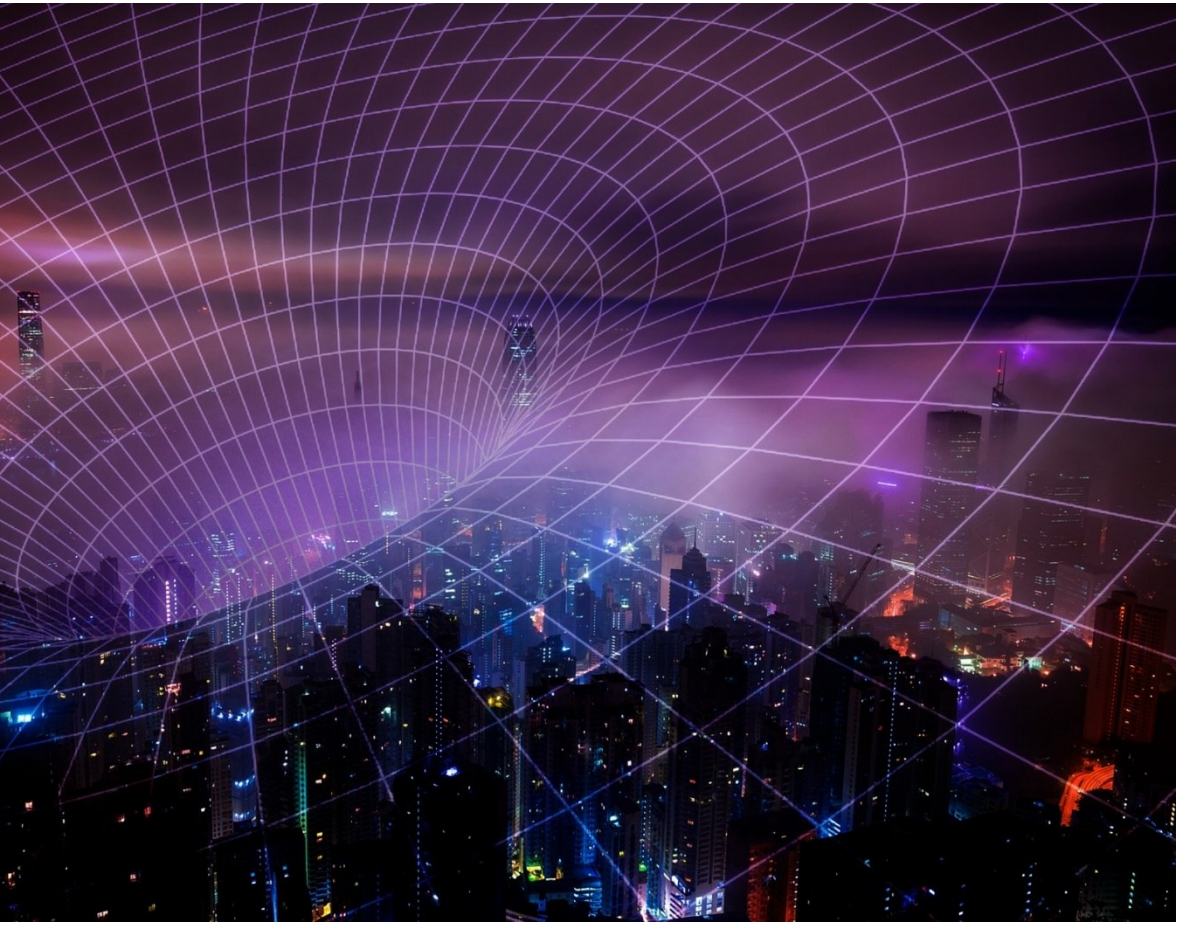
Innovation Meets Precision:
Electronics Manufacturer for Radio Technology

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 movements, and multi-user operation be assessed under real conditions. This 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, any transmission scenarios, conditions, or problem cases that occur in field tests can be generated in advance. This is possible because we do not operate the radio *over the air* but entirely via cable connections. The transmission characteristics of a radio link are simulated through a network of RF components. From a radio perspective, all objects appear as if they were operating in free space, bringing genuine realism into the test laboratory.

// Radio Field Emulation AIAD

Advantages

- // Any application, scenario, or fault case can be simulated in the laboratory.
- // Scalable number of participants (ports) and flexible configuration options.
- // Field testing is reduced to a minimum – significantly shortening overall test durations.
- // Even wireless devices with extreme transmission powers of 10 W and above can be connected directly to the AIAD solution.
- // Signal levels can be easily attenuated below the UE sensitivity threshold.
- // Vendor-independent and reproducible results.
- // Extremely wide frequency range from 50 to 8000 MHz (other ranges available on request) enabling the simultaneous use of multiple radio technologies.
- // Wireless devices without an RF connection can simply be placed in shielding boxes, which are available in customized versions.

// Radio Field Emulation

Replace Obsolete Systems or Certify New Ones

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

Functional tests are performed on demonstrators or within scaled-down test environments, which are usually customised and cover only a limited range of functions. Testing under real conditions using existing technology is rarely conducted, or can only be realised with considerable personnel and material resources. The challenges are similar to those encountered during development or 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 can reproduce any scenario, condition, or fault case in the laboratory. New developments or legacy systems are connected to the network via RF cabling. The quick exchange of different brands or device types can be handled with ease. 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.
- // The performance of new systems can be comprehensively tested in conjunction with real equipment.
- // Manufacturer-independent testing ensures objectivity.
- // Field testing is required only for mechanical stress validation.
- // The validation process is significantly shortened.
- // Operational readiness is considerably accelerated.

// 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

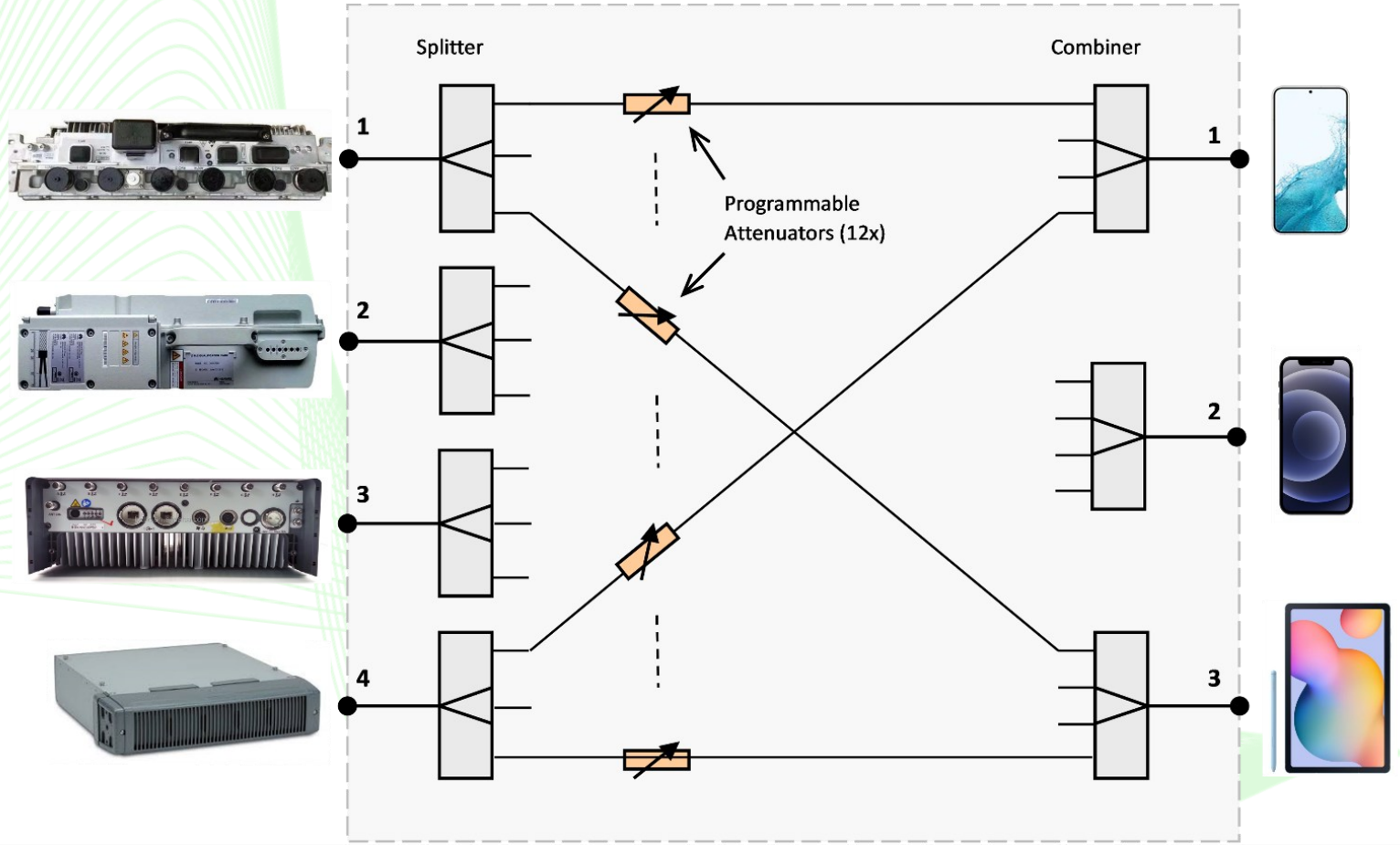
// Radio Field Emulation AIAD

Specifics of AIAD Devices

- A programmable attenuator is available in each path of the radio field emulation.
- Standard attenuation range from 0 to 95 dB in 1 dB steps.
- Extended range from 0 to 122 dB available, e.g. for IoT applications.
- Switching between attenuation levels is continuous and interruption-free.
- The selected attenuation is identical in both the uplink and downlink directions.
- Alternatively, partially meshed or unbalanced network configurations are also 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

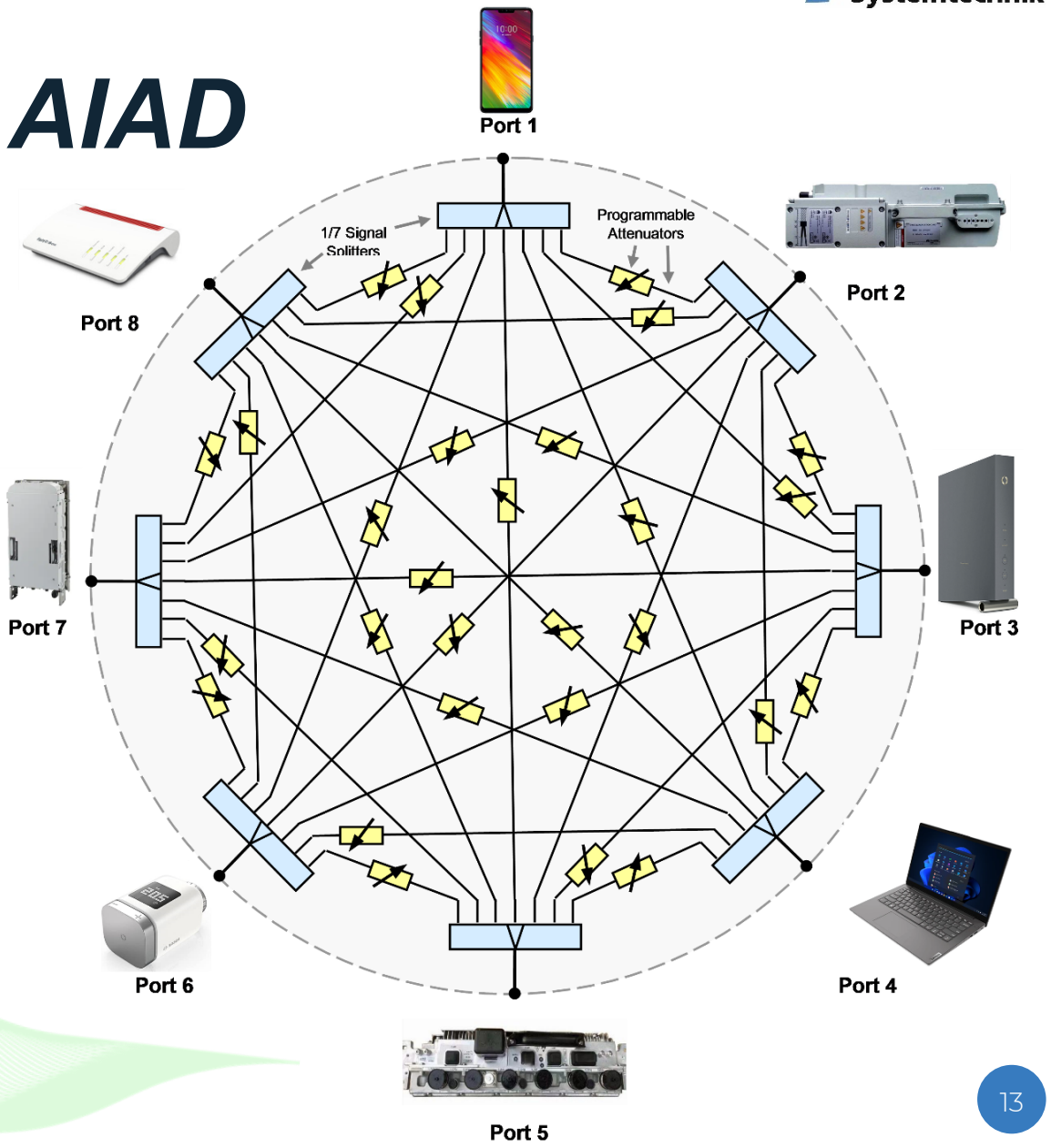
Example AIAD Configured with 4 inputs and 3 outputs



// Radio Field Emulation AIAD

Example AIAD+ Configured with 8 ports

- // Ring topology according to block diagram.
- // Inputs fully meshed in all directions.
- // Communication also possible between UEs.
- // Number of connections configurable to customer requirements.



// Radio Field Emulation AIAD

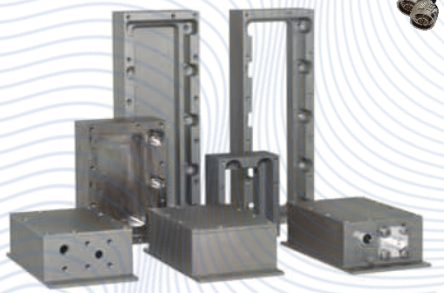
Summary

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!


Ready for the future –
Ready for new technologies
5G

MTS Systemtechnik

// Main customers

MTS Systemtechnik

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

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