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5G Testbed Industry 4.0 – Introduction

5G for Industrial Applications

Experience cutting-edge testing capabilities: Witness our measurement and drive test vehicle in action, enabling comprehensive testing and evaluation of 5G technologies even in extended environments.

Getting started with 5G for industrial applications presents diverse challenges – assessing system performance, testing mobility in indoor environments or evaluating overall solution robustness through extensive testing. At Fraunhofer IIS, we understand that implementing a suitable testing environment can be both time and cost-intensive, and that is where our 5G testbeds come into play.

A Gateway to 5G

Enter the 5G Testbed Industry 4.0, a flexible test environment that supports multiple technologies like 5G, WLAN, UWB (Ultra-Wideband), and other advanced wireless technologies, designed to save your valuable time and resources. We recognize the complexity of ensuring compatibility across different manufacturers, therefore our test beds are strategically equipped with cutting-edge radio technology from various vendors. This ensures that the process of proving compatibility is not only simplified but seamlessly integrated into your testing journey. But our commitment goes beyond technology. We understand your need for neutral support and expertise throughout your validation tasks. Our team stands ready to provide expert advice, guiding you toward successful testing.

At the 5G Testbed Industry 4.0, we provide more than a simple testing environment; we offer a tailored, manufacturer-neutral end-to-end testing solution framework. This empowers our clients in industrial and logistics sectors to test application scenarios, leveraging the latest mobile communication technology within two different standalone 5G campus networks. From preparation to execution and analysis, we assist in refining digitization strategies and making investment decisions.

Explore our 3D positioning unit, which can navigate freely throughout our state-of-the-art facility for automated 3D measurement.

The 5G Testbed Industry 4.0 is located across multiple sites and covers an area of more than 11.000 sqm (controllable area, more coverage outside the property boundaries):

- **Industrial Indoor Area:** This is the factory type hall, which is accessible with heavy trucks and measures 45 x 31 x 9 meters.
- **Outdoor:** The testbed provides coverage from a 40 m high antenna mast and in an outdoor shunting area with indoor-outdoor coverage in separate locations.
- **Office Building:** The testbed also features several office building type environments.

Our partnership focuses on meeting your specific needs and ensuring your success in deploying even complex and safety-critical applications.

Exploring the Possibilities of the 5G Testbed

The 5G Testbed Industry 4.0 provides extensive capabilities for testing and evaluating communication and positioning systems. Our scientific staff conducts automated and manual tests, measuring the performance and characteristics of your applications or systems. With a focus on reliability, real-time capability, accuracy and dynamics our testing is tailored to meet the specific needs of our customers.

The testbed allows the simulation of numerous industrial processes under realistic conditions. This ensures that the performance and functionality of communication and positioning systems can be thoroughly evaluated and validated.

Furthermore, to provide the optimal testing environment, the testbed is equipped with high-precision positioning reference systems that ensure precise and repeatable results. Additionally, we can utilize measurement robots to automate the testing process, enhancing efficiency and reliability. With the 5G Testbed Industry 4.0, you can explore the full potential of your ideas with 5G, ensuring their effectiveness and readiness for a real-world implementation.

Highlights of the Testbed

The forefront of private 5G networks: Fraunhofer IIS' 5G Testbed Industry 4.0 showcases two isolated, non-public 5G networks as reference solutions.

- Two standalone 5G New Radio (5G NR) virtualized Open RANs (3700 to 3800 MHz)
- Two on-premises 5G cores (5GC)
- End-to-end virtualization: From RAN to 5GC, wired backhaul, MEC, and campus cloud, everything is built using cloud-native technologies
- Embracing a multi-vendor approach: Open to various 5G technologies and suppliers
- Groundbreaking 5G positioning: The testbed is the first to combine 5G industrial communication with 5G positioning, endorsed by 5G ACIA
- Complementary technology: Wi-Fi 6 and 6E available
- More than 20 different industry grade user equipment types available (cellular modules, routers and phones)

Discover the industrial indoor area of the 5G Testbed Industry 4.0: Our factory type hall, providing a spacious and accessible environment for recreating your use cases, allows testing in a realistic setting without disturbing your active operations.

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