NOFFZ TECHNOLOGIES

RF SOLUTIONS

WIRELESS DEVICE TEST

PRODUCTS AND SYSTEMS FOR VALIDATION & PRODUCTION TESTING

APPLICATION:

Telematics Control Units, Intelligent Antenna Modules,
ADAS & Autonomous Driving Decision Units,
Network Access Devices (NAD), Smart Gateways

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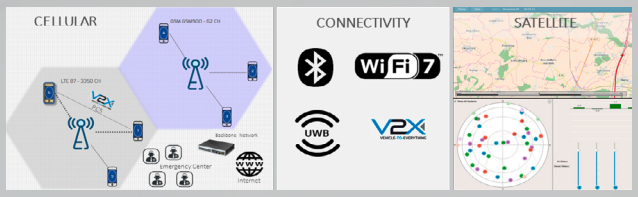
NOFFZ RF TEST SOLUTIONS

RF testing plays a vital role in verifying the performance and reliability of wireless systems and electronic devices. It helps identify and address issues such as signal interference and system inefficiencies, ensuring devices meet regulatory standards and function effectively in practical applications. By conducting RF tests, manufacturers can reduce the risk of failures, improve device quality, and ensure smooth operation. This process is essential for certifying and maintaining technologies that depend on radio frequencies, from everyday electronics to advanced industrial tools, giving companies an advantage in a highly connected market.

THE UTP RF PLATFORM

Your individual products from various industrial sectors require unique and special testing and automation solutions. That's why our experts develop a custom-fit test concept specifically for your particular product. The focus is clearly on high quality, reliable functionality, and a long service life of your products.

From DC to RF, our test systems cover the entire range of measurement technologies, including high-voltage applications or systems with high-speed digital interfaces. The application areas of our automated test solutions are extremely diverse: They can be used as a test system for development and validation, as an end-of-line production tester or as a mobile test station.



Our flexible test and automation solutions are based on our own test platform: **UTP – Universal Tester Platform**.

NOFFZ UTP 7033 RF-RACK

TESTING CONNECTED DEVICES

The complexity of RF testing poses a formidable challenge: instrumentation is expensive, and know-how is scarce. DUTs (Device Under Test) apply a wide range of functionality from the low-channel count, simple devices (smart meters, industrial IoT modems, wearables) to highly integrated products with a dozen or so RF ports (TCUs – telematics control units, smart gateways, smartphones). Each of these devices needs scalable, focused RF test solutions.

5G LTE V2X Wi Fi 7 Bluetooth UWB THREAD zigbee matter

TEST SYSTEMS

FLEXIBLE ADAPTER PLATFORM

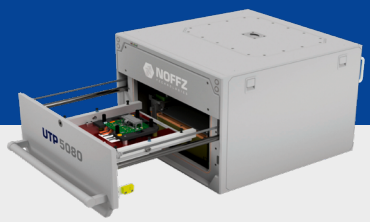
The NOFFZ UTP RF test adapters combine maximum flexibility with high reliability. They feature a modular design, are CE-compliant, and are built to support a wide range of RF-shielded test requirements – from high-density board-level testing to end-of-line testing in mass production.

Whether you are testing a PCB or a finished end product, the UTP 50XY platform adapts precisely to your DUT design and process workflows. This enables efficient integration into existing test systems while ensuring the highest test quality with minimal effort.

THE RIGHT PLATFORM FOR YOUR VOLUME REQUIREMENTS

Increase the number of adapters for parallel testing to efficiently use space and resources. Increase the level of automation to reach the desired production volume. In the heart of the test solutions, we use industry leading RF instrument sharing to keep costs at optimum for the desired takt time.

RF TEST FIXTURE OPTIONS



UTP 5080 - RF BOARD-LEVEL

- Typical PCBA dimensions (W x D x H): up to 250 mm x 225 mm x 50mm
- RF Shielding: >60dB
- Dual Side Contacting: Test points accessible from bottom and top
- Cassette System: Supports both fixed and exchangeable cassette bottom and top

UTP 5070 - RF END-OF-LINE

- Typical DUT dimensions (W x D x H): up to 350 mm x 250 mm x 50 mm
- Custom sizes available
- RF Shielding: >60dB
- All Side Contacting: Test connectors accessible from all sides

All of our adapters are automation ready, stackable and available for semi- or fully automated operations.

IOT TEST NODE

Development, prototyping, validation and production testing of wireless devices in the world of IoT need low cost, easy-to- use test equipment that supports the latest standards. In the past, testing detailed parameters of each component required expensive tools and time-consuming processes. Today, with rapid development cycles, companies need faster, more efficient ways to validate their products. Instead of re-testing pre-certified components, the focus has shifted to validating the overall functionality of systems at the application level. This approach allows developers to ensure the highest quality of their hardware and software without the redundancies of old testing methods.

- Spend only a fraction of the cost compared to traditional instrumentation
- Wi-Fi 6E: 802.11ax/ac/n/a/g/b, 2x2 MIMO, 2/5/6 GHz
- Bluetooth™: 5.2 BDR/EDR/BLE
- Compact, industrial form factor and connections
- Conducted or radiated measurements for multiple DUTs
- Automate test cases in any sequencer or custom script
- Zigbee 3.0 and Thread 1.4.0 (ITN 1200 only)

TECHNICAL DATA

RF Performance	Tx Power uncertainty: +/- 2 dBm | Frequency accuracy: +/- 20 ppm Rx Sensitivity (PER < 10 %): @160 MHz, MCS-11 ax: -53 dBm | @20 MHz, MCS-9 ac: -69 dBm
Interfaces on Front Panel	Female SMA connectors WLAN1/BT | WLAN2 | ZigBee (ITN 1200) | Thread (ITN 1200)
Interfaces on Back Panel	2x Ethernet, ETH1 with Power over Ethernet (PoE) DC power: 2.5 mm inner diameter barrel jack
Dimensions	Housing dimensions ITN 1000/1200: W 105 x H 38 x D 160 mm Housing dimensions ITN 3000: W 162 x H 38 x D 175 mm Rack mounting options available
Weight	0.5 kg
Temperature	Maximum operating temperature range of -40 °C to 80 °C, maximum environmental temperature is 35 °C
Operating Voltage	Unregulated 8 V to 60 V (12 V, 2 A recommended) PoE on ETH1: active 802.3 at, supply power requirement 24 W

MOUNTING OPTIONS

- Plate and wallmount options available with mounting brackets
- 1U height standard 19'' rack mountable plate
- Avialble for the following variations

ITN 3000 – V2X SIMULATOR

ITN 3000 is a user-friendly, off-the-shelf solution designed for comprehensive vehicle-to-everything (V2X) communication testing, supporting both C-V2X and DSRC/802.11p technologies. It provides a streamlined approach to both signaling and non-signaling test scenarios, making it ideal for a wide range of applications. Offering a cost-effective and efficient testing platform, the ITN 3000 is an excellent choice for organizations involved in the development and validation of V2X technologies.

- Signal validation for both DSRC / 802.11p and C-V2X communication protocols
- Transmission of customized BSM (Basic Safety Messages) and CAM (Cooperative Awareness Messages)
- Simulation of up to 10 concurrent virtual vehicles for dynamic testing scenarios
- Easy configuration through an intuitive Web UI and comprehensive API

GNSS SIMULATOR

Real-time, real-world GNSS signal simulation that allows you to simulate hundreds of satellite signals, trajectories, interference, or different vehicle types that would represent the real-world equivalent of your end use. Available in single- and multi-band radio configurations with the following constellations:

- GPS: L1-C/A, L1C, L1-P(Y), L2-P(Y), L2C, L5
- NavIC L1, L5, S-Band
- GLONASS: G1, G2
- Galileo: E1, E5a, E5b, E6, E6PRS, E6 HAS, E5AltBOC
- BeiDou: B1, B2, B1C, B2A, B3I;
- QZSS: L1-C/A, L1 C/B, L2C, L5, L5S
- SBAS (L1/L5): WAAS, EGNOS, MSAS, GAGAN, SDCM
- Xona: PULSAR X1, X5
- Custom Signals, Custom Constellation

It supports differential GNSS and multi-vehicle simulation, GNSS satellite orbit modification, unlimited pseudorange additive ramps and custom fixed positions. Available in Single/Dual/Triple Band hardware configurations, add jamming for detailed interference validation for low-latency HIL applications.

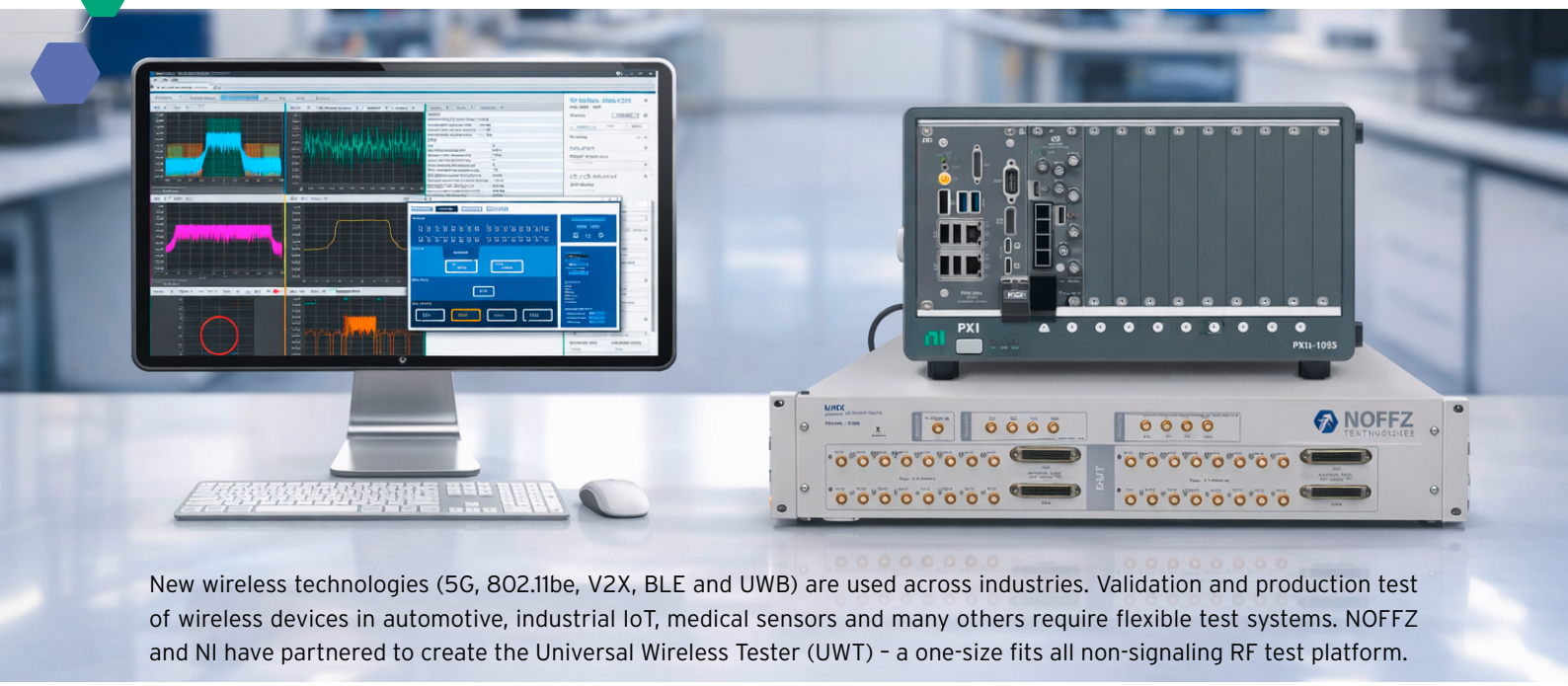
BASE STATION EMULATOR

- 4-Cell Mobile Test Network
- Single-Box, Full Coverage
- Fraction of the traditional costs
- GSM, UMTS, LTE, 5G NR, NTN
- Multi DUT Registration
- Parallel Monitoring
- Data Throughput Testing
- Voice, eCall, VoIP, Handover
- Test Automation API, Intuitive UI

TECHNICAL DATA

BSE Variants	BASE	STANDARD	PRO
Number of Cells	1-2	2-4	2-8
MIMO Option	Up to 2x2 MIMO	Up to 4x4 MIMO	Up to 8x8 MIMO
4G/5G Modes **NTN-IoT** **LTE-M** **NB-IoT**	SA: SISO @40MHz SA: 2x2 MIMO @20MHz (No 5G NSA)	NSA: 2x2 MIMO @50MHz SA: 4x4 MIMO @20MHz SA: 2x2 MIMO @50MHz dual SA: 2x2 MIMO @20MHz SISO @100MHz	NSA: 2x2 MIMO @100MHz NSA: 4x4 MIMO @50MHz SA: 4x4 MIMO @100MHz dual SA: 4x4 MIMO @100MHz SA: 8x8 MIMO @100MHz
Handover	Not optional	5G - 5G SA, 4G - 5G SA, 4G - 4G, 2G - 2G	5G - 5G SA, 4G - 5G SA, 4G - 4G, 2G - 2G
Data throughput	200 Mbps	600 Mbps	2000 Mbps
Optional extras	GSM/UMTS, 5G NR NTN, FR extensions, custom systems		
Authentication	Use test SIM card or test eSIM profile. Algorithms: Milenage, XOR, TUAK and COMP128v1 (legacy)		
RF Performance	Max Tx Output RF Power: +3.3 dBm @900 MHz | Max Rx Input RF Power: +5 dBm Frequency accuracy: +/- 2.5 ppm | EVM (20MHz BW, 64QAM): @2.6GHz, < 2 % | @3.5GHz, < 4 % Phase Noise (1.8GHz): -80 dBc/Hz @10 kHz. -100 dBc/Hz @100 kHz		
RF Interfaces (Front Panel)	4x N-type; MIMO 1: GSM, UMTS, NR/LTE stream 1 MIMO 2-4: NR/LTE stream 2-4		
Interfaces	2x Ethernet, AC power: 100-240 V, 50-60 Hz		
Dimensions	With mounting brackets: W 505 x H 480 x D 630 mm		
Weight	25 kg		
Temperature	Max operating temperature range of 0 °C to 65 °C | Max environmental temperature is 35 °C		

UNIVERSAL WIRELESS TESTER



New wireless technologies (5G, 802.11be, V2X, BLE and UWB) are used across industries. Validation and production test of wireless devices in automotive, industrial IoT, medical sensors and many others require flexible test systems. NOFFZ and NI have partnered to create the Universal Wireless Tester (UWT) – a one-size fits all non-signaling RF test platform.

TECHNICAL DATA

Software Options	
Connectivity test license	Bluetooth 5.x/6.x – DTM, OTA (4.x) non-signaling test Wi-Fi 7/8 (802.11ax/be/bn), DSRC (802.11p) non-signaling test
Cellular test license	2G – 5G, NB-IoT, NTN, C-V2X non-signaling test
Ultrawide-band test license	UWB non-signaling test
Transceiver Options	
Number of Transceivers	1 - 8 (co-operative mode)
Instantaneous Bandwidth	1 GHz
Transceivers for 9kHz - 6 GHz	NI PXIe-5841 (Recommended for legacy device testing)
Transceivers for 100MHz – 9GHz	NI PXIe-5860 (Best price per channel for high-throughput production test)
Extension for 5 - 12GHz support	NI PXIe-5830 (Extension for 12 GHz, supporting the upper UWB chan-nels)
Support for 30MHz – 26.5GHz, 23GHz – 54GHz (mmWave Head required)	NI PXIe-5842 (Extension for FR2, FR3 bands, mmWave heads for 54 GHz)
Switching Options	
Switching upto 8GHz (compact upto 64/128 ports)	UMX – 32-port UMX – 64-port (with UMX Extender)
Switching upto 12GHz (modular platform 1-128 ports)	BXM – 2x4 blocking matrix to control 4x port modules UMX – SP4T/SP8T port modules – cascade upto 32-ports
DC front-end / LNA path (Available for all switches)	Selectable LNA path for Over-the-Air testing Selectable front-end termination (open/short/ESD or custom load) Measure DC current through built-in BiasT
System Components	
Computing	Embedded Controller (NI PXIe-8862)
PXI Chassis	9-slot PXIe chassis with OCXO (NI PXIe-1092) 18-slot PXIe chassis with OCXO (NI PXIe-1098)

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EXPERIENCE GLOBAL EXCELLENCE IN TESTING & AUTOMATION

At NOFFZ Technologies, our dynamic innovation and unwavering commitment to customer service have made us a global leader in testing & automation systems. With a worldwide network of locations in USA, Mexico, Germany, Hungary, Serbia, and China, we provide local expertise and prompt support to industries such as automotive, telecommunication, smart homes, medical technology, and semiconductors. Our market-leading technologies, combined with our international team of experts, ensure the successful implementation and operation of our cutting-edge solutions. Experience global excellence in testing & automation with NOFFZ Technologies today.

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