Test Device Containment Module (TCM)
Optimal conditions for reliable results

ROHDE & SCHWARZ
Mobile Network Testing

Test device containment module (TCM)
Optimal conditions for reliable results

With the rising demand in mobile data traffic and the constant search for ways to increase network efficiency, mobile devices (smartphones) have rapidly evolved to support multiple bands. Based on new antenna technologies, such as MIMO, the number of internal (built-in) RF antennas per device has increased. Latest international ETSI standards suggest that measurements based on external RF antennas are not applicable when MIMO technology is required as they do not reflect the real end-user experience. Also, it is generally known and proven in lab measurements, that uncontrolled and high test device temperatures can negatively affect the device's performance and its measurement results.

Therefore, Rohde & Schwarz mobile network testing (MNT) has designed the test device containment module (TCM), which sets optimal conditions for uninterrupted data collection in a stable environment. The TCM ensures maximum data quality for large-scale benchmarking campaigns with Benchmarker II.

It offers the following key product benefits:
❚ Use of unmodified test devices (smartphones) and their built-in RF antennas
❚ Stable thermal environments and uniform conditions for all test devices to ensure comparable results
❚ Simulation of multiple end-user scenarios (handheld, beside head) in different environments (pedestrian, in-car, in-house), using configurable RF attenuation per device
❚ Unique device self-healing feature to minimize failures or lost data to prevent redrives
❚ Convenient test device access and simplifies future product updates

The patent-pending TCM shows the technology leadership, profound expertise in mobile network testing and ambition from Rohde & Schwarz MNT to provide high-quality products to efficiently collect reliable and high-quality data.

Test device containment module (TCM)
At a glance

- TCM provides a robust, thermo-insulated casing to run devices in a temperature controlled environment
- Simulation of multiple end-user scenarios (handheld, beside head) in various environments (pedestrian, incar, in-house) by applying exchangeable and targeted RF attenuation (absorbing foam) onto single test devices
- A hinged top with a single latch to release offers easy access to the test device
- Vehicle roof box (VRB) or customized installation (e.g. in-car) available

TCM with hinged top and single latch to easily access test device

Thermal insulating foam and active thermal conditioning

Glossy vehicle roof box with special white coating for max sunlight/thermal reflection

Up to 16 TCMs (measurement channels) can be hosted in a single vehicle roof box

Controlled air (cooling/heating) flow path inside the vehicle roof box

Test device containment module (TCM)
The foundation for true benchmarking

Key use case
Large-scale and fully fledged benchmarking campaigns

The TCM is fully compatible with Benchmarker II and can be used as an alternative to the existing ASM (audio slide-in module). The TCM enables multiple use cases for large-scale and fully fledged drive test based quality of experience benchmarking campaigns.

Vehicle roof box setup
TCMs can be installed in the specially designed vehicle roof box (VRB) and connected to Benchmarker II. The VRB can contain up to 16 TCMs (measurement channels) and ensures uniform RF and temperature conditions. The roof box and the IP65 rated cable duct for the cable entry into the vehicle are ready for any weather condition.

Customized installation
TCMs can also be installed in a customized setup, based on the drive test vehicle's configuration (e.g. in-car) or customer specific requirements.

Key product features
Superior temperature control

The TCM features a patent-pending thermal conditioning mechanism. This unique feature provides active cooling and heating inside the TCM and a forced airflow around the device itself. As a result, the sensor-controlled system ensures that all test devices operate at a stable and uniform temperature level, independent of varying TCM ambient temperatures. TCM is the foundation for true benchmarking and ensures maximum data quality and comparable results, also for repetitive measurements (e.g. in different climatic conditions).

Customized and highly efficient heat exchanger for a forced heat flow to and from the ambient

Control unit for temperature stabilization

Uninterrupted large-scale data collection

The TCM is fully compatible with Benchmarker II and benefits from a unique self-healing feature. In case of a test device crash or failure, an automated hardware reset reboots the stuck device (same function as in ASM). This minimizes the need for user intervention during an active measurement campaign and prevents cost-intensive redrives.

Specifications in brief

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Dimensions TCM	W × H × D	13 cm × 20 cm × 31 cm (5.12 in × 7.87 in × 12.20 in), including heatsink at the bottom
Weight TCM	not including the test device	1.8 kg (3.96 lb)
Voltage TCM	DC	10 V to 16 V
Power consumption	for a typical use case	approx. 30 W
Temperature ranges	TCM ambient temperature range to keep a constant inside temperature of 25 °C	−40 °C to +45 °C

Compatibility
TCM is fully compatible with the existing Benchmarker II.

Installation
TCMs can be installed in a special vehicle roof box (VRB) with IP65 cable duct through the car roof or rear side window, or in a customized setup.

Test device containment module (TCM)

Vehicle roof box (VRB)

Test device containment module (TCM)
For comparable, most reliable and high-quality results

Service that adds value

◖ Worldwide
◖ Local and personalized
◖ Customized and flexible
◖ Uncompromising quality
◖ Long-term dependability

Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.
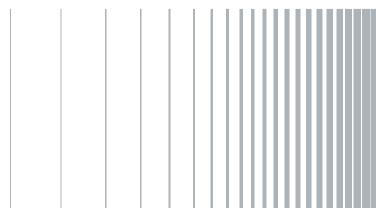
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Mobile network testing

The company's broad and diverse product portfolio for mobile network testing addresses every test scenario in the network lifecycle – from base station installation to network acceptance and network benchmarking, from optimization and troubleshooting to interference hunting and spectrum analysis, from IP application awareness to QoS and QoE of voice, data, video and app based services.

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