Qosmotec

Software Solutions GmbH

Technical Overview

"RF Guard Shielding Box"

RF Guard – The Shielding Box for Test Automation

The Qosmotec RF Guard is a shielding box that has been developed to meet the specific requirements for test automation systems. RF Guard is the standard shielding box delivered together with the Qosmotec LTS end-to-end test automation system, but is designed to fit perfectly into any other automation solution that is based on the use of real UEs (handsets, terminals or datasticks).

RF Guard is provides a high shielding performance, is ideally suited for rack setups, and provides all necessary interfaces and software, to control the UE completely from outside. In addition to this, it is excellently priced, so that it becomes affordable to setup an automated load test environment with each UE shielded individually.

Fig. 1: The shielding box RF Guard in datastick form factor (for smartphones, it is slightly bigger)

Shielding

In the closed shielding box and the antenna connectors closed with 50 Ω terminators, the UE is shielded with minimum 60 dB from any outside network within the frequency range of 400 MHz to 6000 MHz.

Size

RF Guard is provided in 3 different form factors:

The minimum RF Guard dimensions are 16 (L) x 11 (B) x 6 (H) cm (see Figure 1). These dimensions are optimized to place 8 shielding boxes on one standard 19'' extractable rack shelf of 80 cm depth. Therefore, the installation of 8 shielding boxes in a rack consumes no more than 2 height units in a standard rack. Such an arrangement is displayed in Figure 3. The small size fits for all types of datasticks and smartphones up to 3,5'' display. For other type of smartphones with up to 6'' displays a bigger size with dimensions 20 (L) x 12 (B) x 6 (H) cm is available.

Besides to this a bigger form factor for testing with tablet PCs and prototype UEs is available with dimensions 30 (L) x 30 (B) x 17.5 (H) cm as shown in Figure 2.

RF Guard

Fig. 2: The shielding box RF Guard in tablet form factor with 2 additional RF couplers and an Ethernet interface

Fig. 3: Arrangement of 8 RF Guards on a single rack shelf

Interfaces

RF Guard is made for USB controlled UEs. One USB 2.0 cable is leading from each box to any external control computer, from where the UE inside the shielding box can be controlled via AT commands or other automation scripts. For devices, that do not have any USB connection, also a USB to Bluetooth dongle can be used in the box to connect with the UE.

The biggest box type with the tablet PC form factor is additionally equipped with an Ethernet interface, with allows data rates up to 1 Gbit/s.

RF Guard

RF couplers of type SMA-female inside and outside are leading into the box (2 for the datastick and smartphone form factors, 4 for the tablet PC form factor). Those inputs shall be used for MIMO capable UEs inside the box. If the UE is not MIMO capable, the remaining inputs are recommended to be closed with a 50 Ω terminator to preserve the shielding effect of the box. If the UE inside the box does not feature external RF connections, the signal can also be fed in inductively, using a bar antenna for the respective frequency inside the box.

For UEs that are not sufficiently powered via the USB port, RF Guard provides an internal 3-pin female power connector which can be used to lead a power supply of up to 2 Ampere into the box. This can be used to charge the UE via its supplied power cable. Adapters to connect to with the 3-pin connector are provided with the box.

External Control

The UE in the shielding box can be controlled via the external USB port. Additionally, a simple GUI (see Figure 4) as well as command line software is provided, that can interrupt each USB port in the shielding box separately. This enables the user to reinitiate the USB ports from outside as well as interrupting the power supply without opening the box and changing the RF conditions. This software control can be integrated into any test automation software, so that UEs can be be restarted in case of failures.

Fig. 4: GUI interface for interrupting the USB Ports and the power supply in the shielding box

Price

RF Guard provides excellent value for money and therefore allows to acquire a high number of shielding boxes for test automation purposes, so that each UE involved in the test process can be located in its own box to ensure shielding not only from the outside network but also from each other to avoid interferences during the test. A whole shelf of RF Guards is available for the same price as other shielding boxes on the market with equivalent shielding effects.

RF Guard

Technical Data

Shielding	> 60 dB
Frequency range:	400 – 6000 MHz
Size:	Datastick form factor: 16 (L) x 11 (B) x 6 (H) cm Smartphone form factor: 20 (L) x 12 (B) x 6 (H) cm Tablet PC form factor: 30 (L) x 30 (B) x 17.5 (H) cm
RF connectors:	SMA (f) couplers (2 for datastick and smartphone form factor, 4 for tablet PC form factor)
Data connection:	1 USB 2.0 external, 2 USB internal 1 Gbit Ethernet (on tablet PC form factor only)
Power Supply:	3-pin connector (f) (up to 2 Ampere) Series AMPMODU MTE Type TE Connectivity AMP
External control:	UE control via USB or Ethernet Interruption of individual USB ports and power supply via software application