

Invitation



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Dear Customers and Business Partners,

Rohde & Schwarz is one of the world's leading manufacturers of electronic test and measurement and communications equipment.

From the very beginning Rohde&Schwarz has driven innovation in RF technology. We have always taken up the challenge of pushing the limits of what is technically feasible. Today, as in the past, we aim to provide our customers with the market's highest-performance solutions for their applications.

ROHDE&SCHWARZ Portugal and Instituto de Superior Técnico (IST) of Lisboa, cordially invite you to join us in the 5G & IoT Seminar, taking place in the "Centro Congressos/Pavilhão de Civil" of IST, March 21st, Tuesday, from 9:00.

Registration is free.
Reservations are required.
RSVP by March 16th

March 21, 2017
IST - Rua Alves Redol
1000-029 Lisboa

R&S Portugal
Ms. Cristina Vassalo: cristina.vassalo@rohde-schwarz.com

5G & IoT Seminar, March 21st, IST Lisbon

- 9:00 - 9:30 Registration**
- 9:30 - 9:45 Welcome Address and Introduction - *IST/INESC-ID, Univ. Lisboa - Luís M. Correia***
- 9:45 - 10:30 5G Technology Introduction, Market Status Overview and Worldwide Trials - *Rohde & Schwarz - Taro Eichel***
 Abstract: After an introduction of the 5G use cases we will give an update on the 3GPP 5G timeline, the current market and trials status. We will highlight in particular the new 5G technology frame work and air interface.
- 10:30 - 11:15 IoT System Design Challenges and Testing Solutions - *Rohde & Schwarz - Lothar Walther***
 Abstract: Emerging communication technologies enabling the Internet of Things (IoT). The dedicated needs of IoT applications impact also the evolution of wireless communication technologies. In the cellular area, 3GPP's eMTC and NB-IoT are paving the way to massive MTC, one vision of 5G. In the connectivity area, Bluetooth 5.0 just becomes reality. Lora, Sigfox and many other LPWAN technologies expanded rapidly recently. We would like to talk about the technology trend, challenges during IoT device design and testing solutions.
- 11:15 - 11:45 Coffee Break & Demos Setup**
 ■ 5G 3GPP and Verizon pre-5G waveforms (SMW + FSW)
 ■ OTA beamforming measurements (TS7124 with 60 GHz power sensors and Dell 802.11ad module PC)
- 11:45 - 12:30 A Perspective on Cloud and Virtual Radio Access Networks for 5G - *IST/INESC-ID, Univ. Lisboa - Luís M. Correia***
 The application of the concepts of cloud computing and virtualisation to networks, which are currently being considered for 5G, will be addressed for Radio Access Networks. General network architectures will be presented, as well as the new perspectives on the management of radio resources, capacity, and Service Level Agreements.
- 12:30 - 14:00 Lunch + Demos Setup**
 ■ 5G 3GPP and Verizon pre-5G waveforms (SMW + FSW)
 ■ OTA beamforming measurements (TS7124 with 60 GHz power sensors and Dell 802.11ad module PC)
 ■ Video of ATS1000
- 14:00 - 14:45 Challenges and Techniques for Characterizing Massive MIMO Antenna Systems for 5G - *Rohde & Schwarz - Taro Eichel***
 Abstract: One of the key enablers for enhanced Mobile Broadband (eMBB) in 5G wireless communication systems besides using higher signal bandwidths in the millimeter-wave frequency region is the use of massive MIMO with multiple channels and beamforming to increase SNR. However, the high number of antenna elements, limited test interfaces and the high integration with no RF connectors pose a challenge and require over-the-air testing methodologies. In this talk we give an overview of several OTA testing concepts and results from state-of-the-art measurements. Furthermore, we will highlight channel propagation measurements in the mm-Wave frequency region.
- 14:45 - 15:00 Coffee Break**
- 15:00 - 15:45 RPL/6LoWPAN/IEEE 802.15.4g Solution for Smart Metering in an Industrial Environment - *FEUP/INESC TEC, Univ. Porto - Manuel Ricardo***
 Description of a multihop wireless networking solution for Smart Grid metering in an industrial environment. The solution relies on RPL, 6LoWPAN, and IEEE 802.15.4g protocols, it has been implemented using low-power and low-capacity devices, and it supports both TCP and UDP protocols to transport traffic from DLMS/COSEM Smart Grid metering applications.
- 15:45 - 16:30 Panel Discussion**
 ■ Luís M. Correia - Univ Lisboa
 ■ Manuel Ricardo - Univ. Porto
 ■ Taro Eichel - Rohde & Schwarz
 ■ Lothar Walther - Rohde & Schwarz