



Tektronix

IoT Workshop Concept Proposal

3 JULY 2018

Concept Proposal

IOT WORKSHOP OBJECTIVE

- Internet of Things is growing rapidly and is affecting us, as engineers, in designing, testing and trouble-shooting our circuitry with integrated wireless modules. This workshop series is to educate customers, with **SIX** hands-on Labs:

Lab #	Lab Subject	Demo Equipment
Lab #1	General RF/Wireless Signal Generation and Spectral Analysis for IoT Modules and Devices	RSA306B
		TSG4106A
		Laptop installed w/SignalVu
Lab #2	Bluetooth Transmitter Testing	RSA306B
		Laptop installed w/SignalVu
Lab #3	Vector Network Analysis for IoT Components and Devices	TTR506A
		Laptop installed w/SignalVu & VectorVu
Lab #4	EMC Pre-Compliance of IoT Devices	RSA507A
		Laptop installed w/SignalVu & EMCVu
		EMC Accessories, e.g. Biconical Antenna
Lab #5	Cross-Domain Trouble-Shooting of IoT Devices with EMI Near Field Hunting	MDO4104 (or any other model)
		MDO Demo Board
		The Near Field Probe Set
Lab #6	IoT Device Low Power Consumption Measurements and Battery Simulation	DMM7510
		PSU2281
		2450

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IOT WORKSHOP OBJECTIVE

1. Full-Day Workshop. Lunch Provided
2. 5 Lab Stations. Each Lab 60 min. Attendees take turns to do all the 5 Labs
3. Agenda

Time	Agenda
9:00-9:30am	30 min IoT Wireless Standards Test Challenges and Solution Overview
9:30 - 10:30am	Lab #1
10:30 - 11:30am	Lab #2 (Tea Break served at ease)
11:30 - 12:30pm	Lab #3
12:30 - 1:30pm	Lunch
1:30 - 2:30pm	60 min IoT Devices Troubleshooting & Power Consumption Measurements
2:30 -3:30pm	Lab #4
3:30 - 4:30pm	Lab #5 (Tea Break served at ease)
4:30 - 5:30pm	Lab #6

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LAB #1

LAB #1: General RF/Wireless Signal Generation and Spectral Analysis for IoT Modules and Devices

Demo Equipment: RSA306B + TSG4106A + RSA Demo Board

Key Things to Learn in this Experiment:

1. Learn how to check the digital modulated signal quality with RSA306B signal analysis
2. Learn how to generate digital modulated signal with TSG4106A
3. Learn how to measure the phase noise and harmonics



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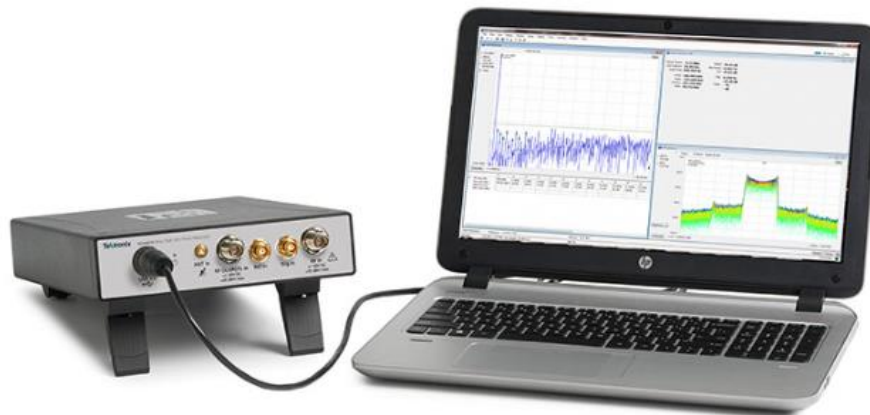
LAB #2

LAB #2: Bluetooth Transmitter Testing

Demo Equipment: RSA306B with Demo Board

Key Things to Learn in this Experiment:

1. Learn about the Bluetooth certification testing
2. Learn the Bluetooth transmitter testing requirement
3. Find out how easy it is to do a Bluetooth certification testing



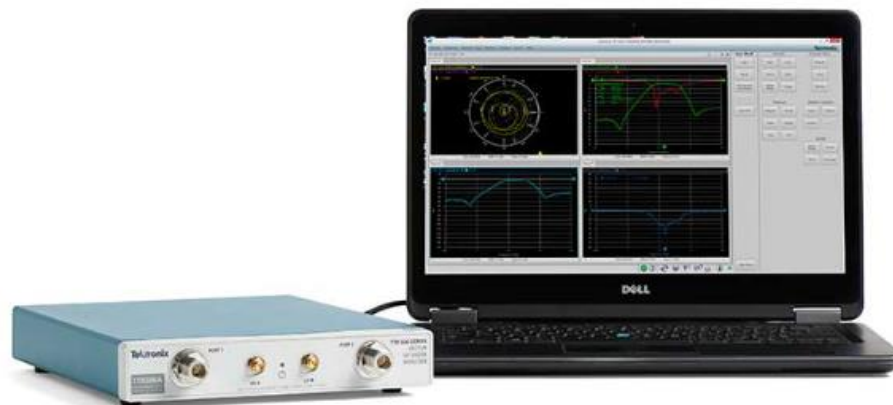
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LAB #3

LAB #3: Vector Network Analysis for IoT Components and Devices
Demo Equipment: TTR506A with VectorVu & Devices Under Test

Key Things to Learn in this Experiment:

1. Learn how to characterize a filter
2. Learn how to use and read the result of VNA
3. Learn how to find the operating frequency of an antenna



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LAB #4

LAB #4: EMC Pre-Compliance of IoT Devices

Demo Equipment: RSA507A with EMCVu and Accessories

Key Things to Learn in this Experiment:

1. Learn how to do EMC Pre-Compliance for Radiated Emissions
2. ...(by Wei Xiang)
3. ...(by Wei Xiang)



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LAB #5

LAB #5: Cross-Domain Trouble-Shooting of IoT Devices with EMI Near Field Hunting
Demo Equipment: MDO4000C with Demo Board and Near Field Probes

Key Things to Learn in this Experiment:

1. Learn how a time domain signal will affect the frequency domain
2. Find out the advantage of a spectrum analyzer compared to the FFT function
3. Learn the advantage of a correlated measurement



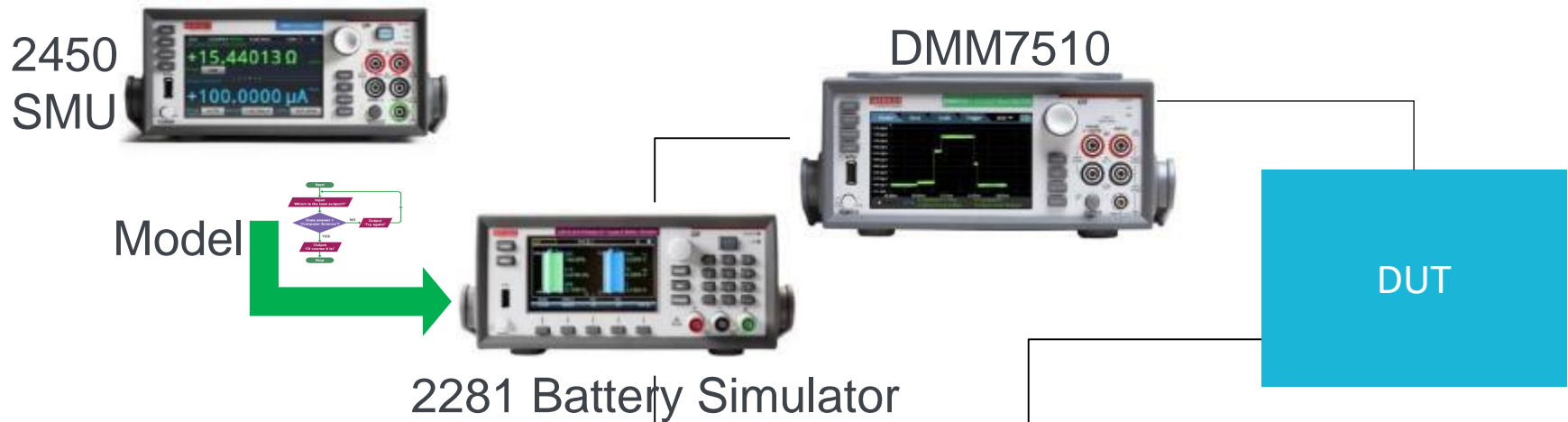
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LAB #6

LAB #6: IoT Device Low Power Consumption Measurements and Battery Simulation
Demo Equipment: DMM7510, PSU2281 & 2450 SMU

Key Things to Learn in this Experiment:

1. Learn how to measure low power consumption of IoT Devices
2. Learn how to maximize battery life of your IoT Devices
3. ...(by Harry/Lip Fong)
4. ...(by Harry/Lip Fong)



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IOT WORKSHOP DEMO EQUIPMENT LIST

Lab #	Lab Subject	Demo Equipment
Lab #1	Testing IoT Modules & Devices against different Wireless Standards, e.g. Bluetooth	RSA306B
		TSG4106A
		Laptop installed w/SignalVu
Lab #2	Vector Network Analysis for IoT Components and Devices	TTR506A
		Laptop installed w/SignalVu & VectorVu
Lab #3	EMC Pre-Compliance of IoT Devices	RSA507A
		Laptop installed w/SignalVu & EMCVu
		EMC Accessories, e.g. Biconical Antenna
Lab #4	Cross-Domain Trouble-Shooting of IoT Devices with EMI Near Field Hunting	MDO4104 (or any other model)
		MDO Demo Board
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CUSTOMER INVITATION

- Tektronix will send invitation Email to potential customers
- Our Authorized Distributor will also send the same invitation Email to their customers
- We will advertise such workshop on sg.tek.com & Tek ASEAN ANZ Facebook page
- We will build a registration page for customers to register and reserve a place (if required)
- Partner may need to invite their Key Customers to join the workshop

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USEFUL IOT TRAINING CONTENT & CUSTOMERS COLLATERALS

- Power Consumption

- Power Consumption Profiling Battery Life Analysis Techniques (literature #: 1KW-60969-0)
- Overview of IoT Power Consumption and Battery Life Simulation PPT
- Solution for Determining Power Consumption Battery Devices Webinar PPT (Rev4_8-27-2016)
- Solving the IoT Power Consumption Challenges Webinar MP4
- Profile power consumption of a BLE low power device Video MP4

- Wireless Standard and Modules Testing

- How to Select a Blue Tooth Module Application Note (literature #: 37W-60817-0)
- How to Select your Wi-Fi Module App note (literature #: 55W-30468-1)
- IoT Sales Guide PPT
- Standards Testing for IOT devices PPT
- Standards Testing for IOT devices Webinar MP4

- General

- 6 Key Challenges of Internet of Things eBook



Chuyên gia của hãng Tektronix

MR TAN WEI XIANG



- Kỹ sư ứng dụng khu vực
- Là kỹ sư ứng dụng khu vực, Wei Xiang chịu trách nhiệm về thiết bị phân tích tín hiệu, mang lại cái nhìn sâu sắc và giải pháp đo lường chính xác cho khách hàng.

Trước đây, Wei Xiang là Kỹ sư tương thích điện từ tại ST Electronics. Ông có chuyên môn trong kiểm tra và chẩn đoán EMC, tìm phát hiện nhiễu, kiểm tra nguy cơ bức xạ và quản lý dự án. Wei Xiang tốt nghiệp Cử nhân Kỹ sư Điện của Đại học Quốc gia Singapore.

Chuyên gia của hãng Tektronix

MR HARRY HU



- Chuyên gia ứng dụng
- Là một kỹ sư ứng dụng tại Tektronix, Harry chuyên sâu về sản phẩm của Keithley, nghiên cứu mang lại độ chính xác cao cho đo lường mức độ thấp, mô tả đặc tính bán dẫn và giải pháp tự động kiểm tra tùy chỉnh cho khách hàng.

Harry từng là Kỹ sư ứng dụng tại National Instrument có chuyên môn về kiểm soát thiết bị và tự động hóa kiểm tra. Harry tốt nghiệp Đại học Công nghệ Nanyang với bằng Thạc sĩ ngành Kiểm soát và Thiết bị đo kiểm.