

# Advanced IoT Teaching Lab Solution

## Now Remote Ready!

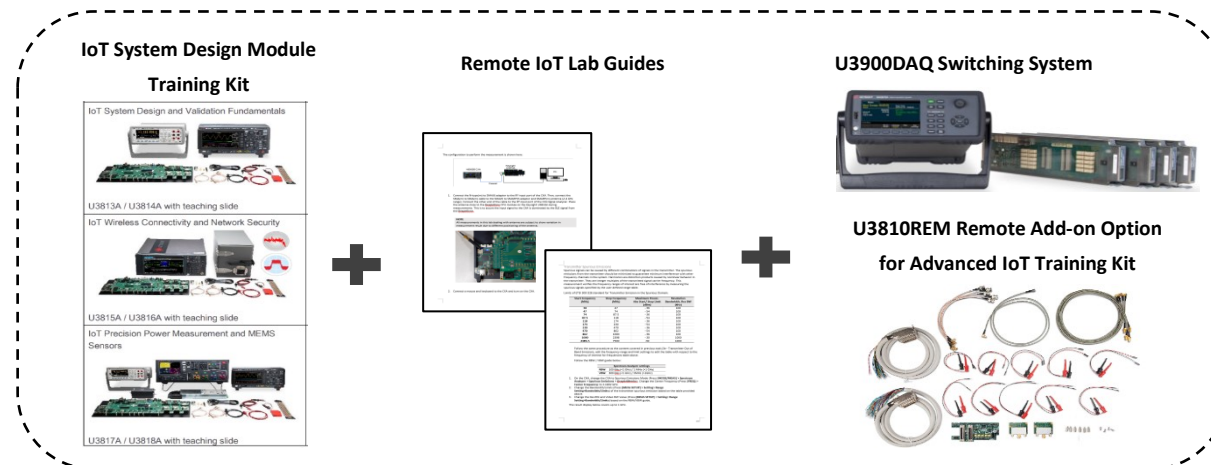
### End-to-end IoT Learnings, from Fundamentals to Real-world Design Considerations

The IoT revolution races on, and now educators and students alike can leap ahead with Keysight's ready-to-teach advanced IoT teaching solution. Designed to teach students practical design and test techniques from the fundamentals of system design to wireless communication and power measurement, this solution also covers critical design considerations that is emerging with the evolution of the Internet of Things, such as device and network cybersecurity, radio certification and compliance, and power continuity.

All this content is not rooted in theory alone – the advanced IoT teaching solution comes with editable slides and lab sheets for the classroom and for the lab, and a training kit with detailed lab procedures that is designed to work hand-in-hand with industry standard test and measurement instruments and software, giving students the opportunity to work with the same equipment they would use when they are out in the industry.

### Remote Advanced IoT Teaching Lab Solution

PW9112EDU PathWave Lab Operations for Remote Learning



### Advanced IoT Teaching Lab Solution

- IoT Training Kit
  - Beagle Bone Green - 2.4G ZigBee, Digital and Analog sensors, Lora Module(wired)
- Courseware
  - Editable PowerPoint slides that cover 75+ hours of classroom sessions
  - Editable lab sheets, model answers, problem-based assignments able to covers 50+ hours of lab sessions
- Recommended Instruments and software
  - IoT system design and validation fundamental lab – Digital Multimeter and Oscilloscope
  - IoT wireless connectivity and network security lab – CXA signal analyzer, anechoic chamber, VSA software and X series application in WAN, Bluetooth and EMI
  - IoT precision power measurement and MEMS sensors lab – Digital multimeter, oscilloscope, power analyzer, 2-quadrant source, event detector and analysis software

Product number	Description
<b>Module 1: IoT System Design and Validation Fundamentals</b>	
U3813A	IoT System Design and Validation Fundamentals applied courseware, with training kit and lab
U3814A	IoT System Design and Validation Fundamentals applied courseware, with training kit, lab and teaching slides
<b>Recommended instruments</b>	
34465A <sup>1</sup>	6½ digit, performance Truevolt digital multimeter
DSOX1204G	Oscilloscope: 70/100/200 MHz, 4 Analog Channels

Note: Other 34460 Series Truevolt DMMs models may be used, but 34465A is recommended as this model comes with a digitizing option for use with the IoT Sensors and Power Management applied courseware

Product number	Description
<b>Module 2: IoT Wireless Communication and Compliance</b>	
U3815A	IoT Wireless Communication and Compliance applied courseware, with training kit and lab
U3816A	IoT Wireless Communication and Compliance applied courseware, with training kit, lab and teaching slides
<b>Recommended instruments and software</b>	
N9000B	CXA Signal Analyzer - Multi-touch, 9 kHz to 7.5 GHz (minimum 3 GHz required) Option B25 - Analysis Bandwidth, 25 MHz
U3830A	Anechoic WaveChamber -Portable Wireless Anechoic Test Chamber (or equivalent)
<b>For qualified education customers</b>	
89600EDU-E15	89600 VSA software for education, 1-year support included, with 15 seats of perpetual floating license for student, and x1 transportable perpetual for instructor
X-Series Measurement Applications	X-App: Propose perpetual and node locked <ul style="list-style-type: none"> <li>N9077EM0E: WLAN 802.11a/b/g/j/p/n/af/ah Measurement Application</li> <li>N9081EM0E: Multi-touch UI Bluetooth® Measurement Application</li> <li>N6141EM0E: Multi-touch UI X-Series measurement application license for EMI measurements with multi-touch UI</li> </ul>

Note: Customer are free to choose other type of license for X-App software according to desire lab size

Product number	Description
<b>Module 3: IoT Precision Power Measurement and MEMS Sensors</b>	
U3817A	Precision Power Measurement and MEMS sensors applied courseware, with training kit and lab
U3818A	Precision Power Measurement and MEMS sensors applied courseware, with training kit, lab and teaching slides
<b>Recommended instruments and software</b>	
34465A DMM	<ul style="list-style-type: none"> <li>6½ digit, performance Truevolt digital multimeter with high-speed digitizing and 2M memory</li> <li>DIG + MEM + 34138A</li> </ul>
DSOX1204G	Oscilloscope: 70/100/200 MHz, 4 Analog Channels
N6705C	DC Power Analyzer, Modular, 600 W, 4 Slots
N6781A	2-Quadrant Source/Measure Unit for Battery Drain Analysis, 20 V, ±1 A or 6 V, ±3 A, 20 W. Required 2 units in the courseware
X8712AD	Event based detector
KS833A2A	PathWave Event Based Power Analysis, Node Locked, subscription license

Product number	Description	
<b>Remote Advanced IoT Teaching Solution</b>		
U3810REM	Add Remote Teaching Option for U3810A Advanced IoT Series	
<b>Recommended instrument and modules</b>		
U3900DAQ	DAQ970A	Data acquisition system with USB and LAN
	DAQM901A	20 Channel multiplexer
	DAQM903A	20-Channel actuator/general purpose switch
	DAQM905A	Dual 4-Channel RF multiplexer 50 Ω

Note: To setup the lab in remote connectivity capability, you will be required both the U3810REM and U3900DAQ options. For U3900DAQ, you will need a DAQ970A mainframe and three modules DAQM901A, DAQM903A and DAQM905A for all the course modules (U3813A/14A, U3815A/16A, U3817A/18A). A U3810REM kit is required for each training kit to make the remote connectivity ready.

More Information: <https://www.keysight.com/find/AdvancedIoT>

For more information on Keysight Technologies' products, applications, or services, please contact your local Keysight office.

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**DISTRAME**

Parc du Grand Troyes - Quartier Europe Centrale, 40 rue de Vienne - 10300 SAINTE-SAVINE  
Tél. : 03 25 71 25 83 - [infos@distrame.fr](mailto:infos@distrame.fr) - [www.distrame.fr](http://www.distrame.fr)