

# Keysight U3807A/08A IoT Sensors and Power Management Applied Courseware



The IoT Sensors and Power Management applied courseware is a ready-to-teach package focused on the IoT device design, with the goal of teaching students how to characterize power consumption of IoT device onboard controller, sensors, and wireless modules. Students will understand the principles of power management and will be able to characterize micro-electro-mechanical systems (MEMS) devices. The courseware is designed as a resource for lecturers, and consists of teaching slides and a training kit.

- Targeted university subject: IoT device power management, IoT sensors technologies, advanced IoT
- Targeted year of study: Third to final year undergraduates
- Prerequisites(s): Basic electronics, C programming, IoT fundamentals, feedback control systems

## Key features

- Comes with teaching slides and a training kit designed for a full semester of teaching. A complete solution to accelerate the setup of a new IoT-focused course.
- Integrates hands-on industry-relevant experiences and real-world applications in IoT design and testing. Incorporates power consumption characterization of the onboard subcircuits such as the processor, wireless connectivity module and sensors and usage of industry-grade tools, such as low-current measurement digital multimeter (DMM) and DC power analyzer.
- Yearly updates for three years at no additional cost, keeping pace with evolving IoT trends and technologies.
- Visible hardware building blocks on the training kit.

Teaching Slides	Training Kit
Editable Microsoft PowerPoint slides	IoT development kit
Covers 36+ hours of classroom sessions	IoT sensor devices, MEMS pressure sensor
	XBee ZigBee® kit
	Lab sheets (Microsoft Word) and model answers
	Problem-based learning assignments
	Covers 18 hours of lab sessions

## Topics covered in the IoT Sensors and Power Management applied courseware

Teaching Slides	Lab Sheets	Problem-Based Assignments
Overview of Internet-of-Things (IoT) System	Setting Up IoT Gateway and Connecting Sensor Network to the Cloud	Optimizing Power Consumption in IoT Sensor Nodes
Essentials of Power Circuits	Characterizing IoT Sensor Board (Device) Static and Dynamic Power Consumption	
Fundamentals of Power Measurement	Evaluating the Impact of Dynamic Current Drain and Solar Energy Harvesting on IoT Battery Life	
Power Management Techniques	Optimizing Power Consumption and Efficiency Using Dynamic Power Management in Sensor Networks	
Overview of Sensor Technology	Characterizing MEMS Accelerometer and Gyroscope Sensors, and their applications	
Sensor Measurement Techniques	Characterizing MEMS Pressure and Temperature Sensors for Applications in Harsh Environment	
Sensor in Action	Gesture Control using Inertial Measurement Unit (IMU)	
Case Studies		

## IoT Development Kit Characteristics

IoT Development Kit	
Dimensions	20 cm (w) x 8.5 cm (d) x 5 cm (h)
Compute module	Intel Edison (a dual-core, dual-threaded Intel Atom CPU at 500 MHz and a 32-bit Intel Quark microcontroller at 100 MHz)
RAM and flash storage	1 GB LPDDR3 PoP memory and 4 GB eMMC
Wireless communication	WLAN 802.11 a/b/g/n, <i>Bluetooth</i> ® LE (version 4.0), and ZigBee wireless connectivity
General	
Supply	6 to 12 V AC adapter (2 mm DC jack) USB port
Warranty	1 year 3 months for accessories

## IoT Sensors and Power Management applied courseware ordering information

Product Number	Description
<b>IoT Sensors and Power Management Applied Courseware</b>	
U3807A	IoT Sensors and Power Management applied courseware, with training kit only
U3808A	IoT Sensors and Power Management applied courseware, with training kit and teaching slides
Add-on options available for purchase for users of IoT Fundamentals, Systems Design, Wireless Communications applied courseware	
U3800PW1	Add Sensors and Power Management training kit for U3800 Series
U3800PW2	Add Sensors and Power Management Training Kit and Teaching Slides for U3800 Series
<b>Recommended instruments</b>	
34465A-DIG, -MEM	6½ digit, performance Truevolt digital multimeter with high-speed digitizing and 2M memory
DSOX2004A	Oscilloscope: 70 MHz, 4 analog channels
<b>Optional, for advanced lab setup only</b>	
N6705C,	DC power analyzer
N6781A	2-quadrant source/measure unit for battery drain analysis, 20 V, ±1 A or 6 V, ±3 A, 20 W

## System and Installation Requirements

PC operating system	Windows 7, 8 and 10 (64-bit)
Interface	USB (3 ports)

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