Comprehensive Wireless USB

Training

Let MindShare Bring “Wireless USB” to Life for You

Wireless USB (WUSB) promises to revolutionize USB peripheral connections to mainstream computers, embedded systems, and to each other through the use of a standardized wideband radio interface. WUSB is compatible with, and builds upon the existing wired USB 1.1 and 2.0 specifications. Hardware, software, and design/test tools are available to help manufacturers move products to wireless USB.

You Will Learn:

- The features and characteristics of the WiMedia Ultra-wideband (UWB) common radio platform
- The requirements for implementing a Host Wireless Adapter (HWA)
- The requirements for implementing a Device Wireless Adapter (DWA)
- How host software schedules and manages Wireless USB traffic
- To validate operation of the Media Access (MAC) and Physical (PHY) layers, including: MAC channel time, super-frames, Beacon Periods, Media Access Slots (MAS), and MMC time stamp
- How WUSB handles device attachment, enumeration and configuration, connection security, and error handling
- How WUSB handles power management (suspend and resume)

Course Length: 4 Days

Who Should Attend?

Hardware, software, validation engineers, and others needing a thorough understanding of Wireless USB. This course contains practical examples of WUSB protocols and error conditions and employs the use of a protocol analyzer/exerciser.

Course Outline:

- Wired USB 1.1 and 2.0 key features
- Wired USB Software model and Host Controllers (UHCI, OHCI, EHCI)
- Wired USB peripheral devices, endpoint types, configuration descriptors
- Wired USB bus protocol: attach/detach model, transfer types, transaction examples, error handling, power management
- WUSB architectural overview: hub-spoke topology, DWA and HWA hardware enabling wired USB device/host to use wireless communication. CWUSB changes in device attachment, enumeration and configuration, connection security, error handling. New device and host Media Access (MAC) Layer responsibilities
- WUSB Data Flow Model: host/device clusters, establishing wireless USB channels, Physical Layer (PHY) and MAC layer packet handling. MAC channel time, super-frames, Beacon Periods, Media Access Slots (MAS), MMC time stamp, etc
- Special WUSB Data Flow events, including Device Notification, Transmit Power Control, adjustments to Data Packet payload size and transmit bit rate, changing the PHY channel, host Channel Stop, device initiated Remote Wakeup and Channel Start, etc
- WUSB Protocol Layer: Details of MAC Layer standard and WUSB frame formats. Description of PHY Preamble and Header, MAC Header and data payload (MAC frame body), PHY and MAC layer error checking, secure vs. non-secure packets
- Four information packet types: Micro-scheduled Management Command (MMC), protocol data packet, protocol handshake packet, and device notification packet
- Micro-scheduling one or more transactions (Transaction Group) using the MMC and specified channel time that follows
- Transaction group rules and constraints, time slots and inter-time slots, rules for multi-data packet burst
- WUSB Transactions: Basics of WUSB split-transaction token/data/handshake protocol, host setup of time slots, special features of isochronous and control transfers, Device Notification message details, flow control events
- WUSB radio interface security concerns: mutual authentication that the intended devices are connected and prevention of data theft by nearby receivers. WUSB encryption, encryption keys, connection keys, authentication, and the Association Models Supplement to WUSB
- Device Framework. Unconnected, Unauthenticated, Authenticated device state transitions are summarized. Wireless USB Device Requests and Wireless Extensions to Standard USB 2.0 Device Requests
- Wire Adapter common features: functional diagrams, required endpoints, remote pipe, required buffers, Wire Adapter Class Specific Device Requests
- DWA: downstream USB 2.0 capable port management, Bulk, Control, Isochronous, Interrupt transfers, DWA suspend and resume
- HWA: upstream USB FS/HS port management, Bulk, Control, Isochronous, Interrupt transfers, HWA suspend and resume

**Recommended Prerequisites:**
Completion of MindShare USB class or equivalent knowledge.

**Course Material:**
Students will be provided with an electronic version of the slides used in class.
Are your company’s technical training needs being addressed in the most effective manner?

MindShare has over 25 years experience in conducting technical training on cutting-edge technologies. We understand the challenges companies have when searching for quality, effective training which reduces the students’ time away from work and provides cost-effective alternatives. MindShare offers many flexible solutions to meet those needs. Our courses are taught by highly-skilled, enthusiastic, knowledgeable and experienced instructors. We bring life to knowledge through a wide variety of learning methods and delivery options.

training that fits your needs

MindShare recognizes and addresses your company’s technical training issues with:

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- Serial ATA (SATA)
- Serial Attached SCSI (SAS)
- DDR2/DDR3 DRAM Technology
- PC BIOS Firmware
- High-Speed Design
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- Linux Fundamentals
- ... and many more.

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MindShare Learning Options

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