
Certified Wireless USB

335 Pioneer Way, Mountain View, CA 94041
Tel: 650-968-6800
www.lucidport.com
sales@lucidport.com



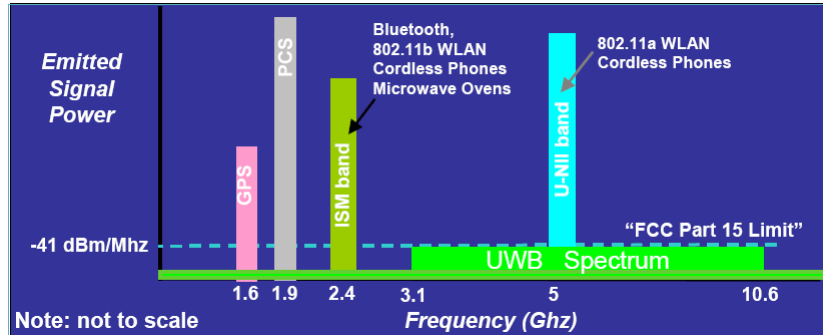
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WiMedia UWB

- “Certified Wireless USB” is based on the WiMedia Ultra-Wide Band protocol
 - This different from Direct Sequence UWB (Freescale), CableFree USB (Belkin), and RF Wireless USB (Cypress)
- WiMedia has been adopted by both the USB and Bluetooth standards committees
- WiMedia has wide industry support from companies like Intel, Microsoft, HP, Nokia, Sony, STM, TI, NEC, etc.
- WiMedia specifies the PHY level protocol, but works with different MAC level protocols (USB, Bluetooth, Ethernet, etc.)



UWB Power

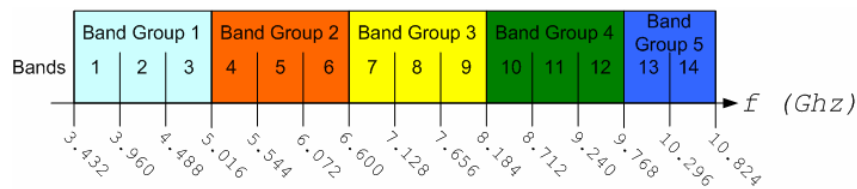


- UWB uses a broader frequency spectrum so it is able to transfer more information faster.
- Since UWB uses the same frequencies as existing standards, its power is limited to the existing noise margin. This restricts the range of UWB transmissions to around 10 meters.

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UWB Spectrum

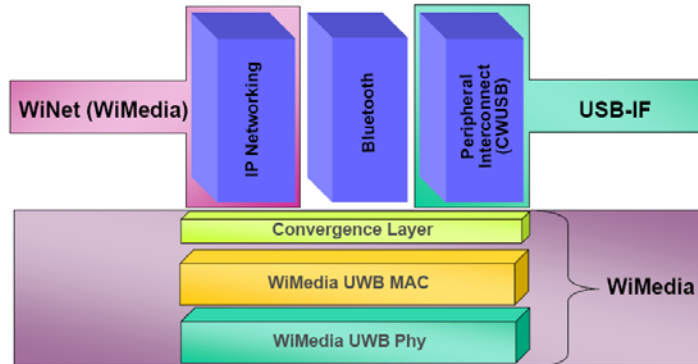


- WiMedia breaks down the 3 to 10 GHz spectrum into 13 different bands
 - These bands are divided into 4 band groups with only the first band group currently operating
 - Each band is 528 MHz wide
 - Each band group allows up to 7 channels
 - This division allows UWB PHYs to be made in CMOS (rather than SiGe)

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Protocol Convergence

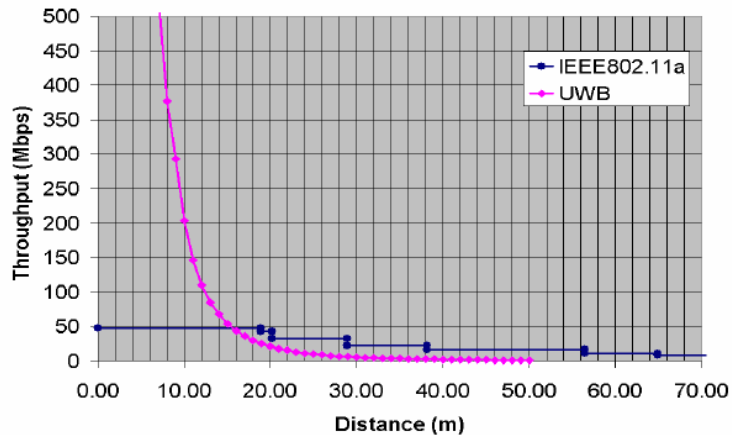


- WiMedia allows multiple protocols to share the same spectrum and use the same radio by using time division multiplexing
- Only the Certified Wireless USB protocol is currently ready.

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UWB Throughput



- At short distances, WiMedia UWB offers 10x the bandwidth of other wireless standards

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Compared with 802.11n

- Certified Wireless USB is often compared to 802.11n
- 802.11n has better range than wireless USB
- But for applications within 10 meters of a PC, Certified Wireless USB is:
 - Cheaper
 - Faster, and uses a more efficient protocol
 - Easier to use and setup
 - Uses significantly less power
 - Is much more secure
- The 802.11n standard is not due until November 2007. The Certified Wireless USB standard is ready today.

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Certified Wireless USB

- Certified Wireless USB creates a high bandwidth wireless network about 10 meters around a host PC
 - It transfers up to 480 Mbps, the same bandwidth as wired Hi-Speed USB 2.0
 - It is software compatible to wired USB.
 - Wireless USB retains the same Host/ Device model as wired USB.
 - Wireless USB requires Association. This is new to USB.

	Bandwidth	Range	Power
Certified Wireless USB	480 Mbps	10 meters	Medium
802.11g	54 Mbps	90 meters	High
Bluetooth	1 Mbps	10 meters	Low
2.4Ghz RF Cypress Wireless USB	62.5 Kbps	50 meters	Low

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Wireless Device Association

- On the first connection, a wireless USB device must be associated with a specific wireless USB host.
- On future occasions, the device will “remember” that host and will automatically connect to it without association.
- Cable Association
 - User connects a standard USB cable between the 2 devices
- Numeric Association
 - User presses a button on the device and starts a wizard on the PC.
 - User checks that a random number (from 0 to 99) on the device’s display is the same as that on the wizard.
- Association Rules from the USB I/F
 - Devices with a wired port must support cable association
 - Devices with a display must support wireless numeric association
 - Wireless USB hosts must support both types of association

Compelling Reasons for Wireless

- Eliminate wire clutter
 - The natural location for a cable modem is near the cable outlet, not near the computer with a thick black cable trailing across the room.
 - With wireless, a printer can be placed on a second table without someone tripping over the cable hanging between it and the PC.
- Convenient for portable devices
 - No longer have to search for the proprietary cable to your MP3 player
 - No longer have to dig out the memory card in your digital camera

Transitional Wireless USB Hardware



- Host Wire Adapters (HWA), Device Wire Adapters (DWA), and Wireless USB Host Controller Cards should be available Q1 2007.
- LucidPort does not make these devices

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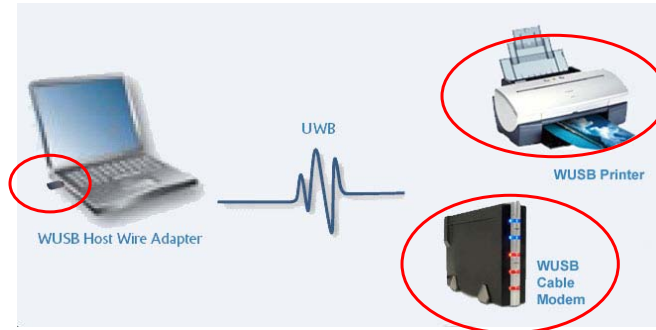
Transitional Wireless USB Hardware

- Host Wired Adapters (HWA)
 - Plugs into the wired USB host port of a PC
 - Adds wireless USB Host functionality to an existing PC
 - Not for host to host communication
- Wireless USB Host Controllers
 - PCI based adapter card
 - Adds wireless USB Host functionality to an existing PC
- Device Wired Adapters (DWA)
 - Plugs into the USB port of a peripheral (printers, scanners, cameras, etc.)
 - Adds wireless USB Peripheral functionality to an existing device
 - May have several device ports (like a USB hub) for making multiple peripherals wireless

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Native Peripherals



- PC peripherals will likely be the first adopters of wireless USB.
- This is because Certified Wireless USB utilizes the same software and host/ device model used by wired USB
- This is LucidPort's target market

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Consumer Electronics

- UWB will eventually target the CE space



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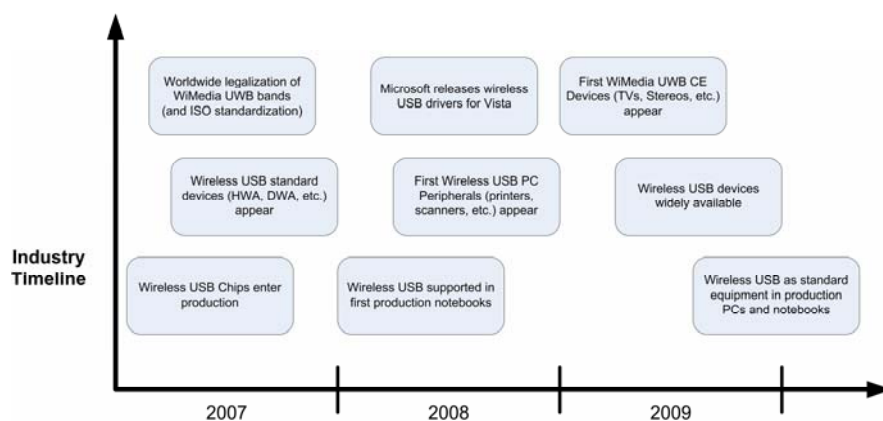
Wireless AV Transmission

- No high quality solution exists today for wireless AV transmission
 - Wires are ugly – so either tear up your house to hide the wires or go wireless.
 - Home Theater:
 - Receiver to speakers, Set Top Box to TV, or STB to HDD
- No clear connection standard for CE devices like there is for USB and PC peripherals
 - UWB provides the necessary bandwidth for transferring high quality audio and video
 - But wireless USB implements a single host / multiple device model. A CE device may sometimes need to be a host and yet at other times be a device.

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Wireless USB Timeline



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Summary

- WiMedia Certified Wireless USB is coming soon
 - Many other UWB implementations are adopting WiMedia
 - Backed by all the major players in the industry
 - Adapter-type products will reach the market Q1 2007
 - Compelling reasons to go wireless
- Wireless USB offers significant performance advantages over all other wireless standards
- Initial products will be transitional
 - Host Wire Adapter, Device Wire Adapter
- This will be followed by traditional PC peripherals, then later, consumer electronics
- As a standard, hosts and peripherals from different vendors interoperate. This means devices can ship without extra dongles or adapters (different from how wireless mice are sold today).