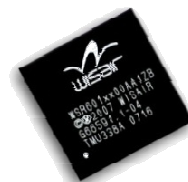




# Industry Perspective of UWB

Walter Workshop, October 2009



Wisair© Proprietary Information



# Agenda

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- ▶ UWB Market Overview
  - ▶ Top level overview
  - ▶ Wireless USB
  - ▶ Market phases
- ▶ Market and Products Status
  - ▶ Wireless USB ecosystem
  - ▶ Applications and use cases
  - ▶ Products in the market
  - ▶ USB-IF promotion efforts
- ▶ WiFi Complimentary Model
- ▶ What's Next
  - ▶ Expediting and increasing market deployment





# Market Overview

# UWB Market Top Level Overview



- ▶ VERY FEW proprietary application protocol products
  - ▶ Example: Leyio
  - ▶ Not many other examples...
- ▶ Bluetooth over UWB standard is yet to be released
  - ▶ Bluetooth 3.0 went out with WiFi as an intermediate solution (x10)
  - ▶ Bluetooth over UWB expected to follow (x100 solution)
  - ▶ Additional regulatory work (e.g. harmonizing >6GHz) is a key to expedite adoption of UWB
- ▶ Current UWB market is ~100% Wireless USB
  - ▶ Number of products and vendors is increasing
  - ▶ Clearly the leading standard for UWB products
  - ▶ Standard is progressing - V1.1 development in final stages





# About Wireless USB



Universal Serial Bus

- ▶ Standard developed by the USB Implementers Forum ([USB-IF](#))

- ▶ The Wireless USB promoters group in the USB-IF includes:



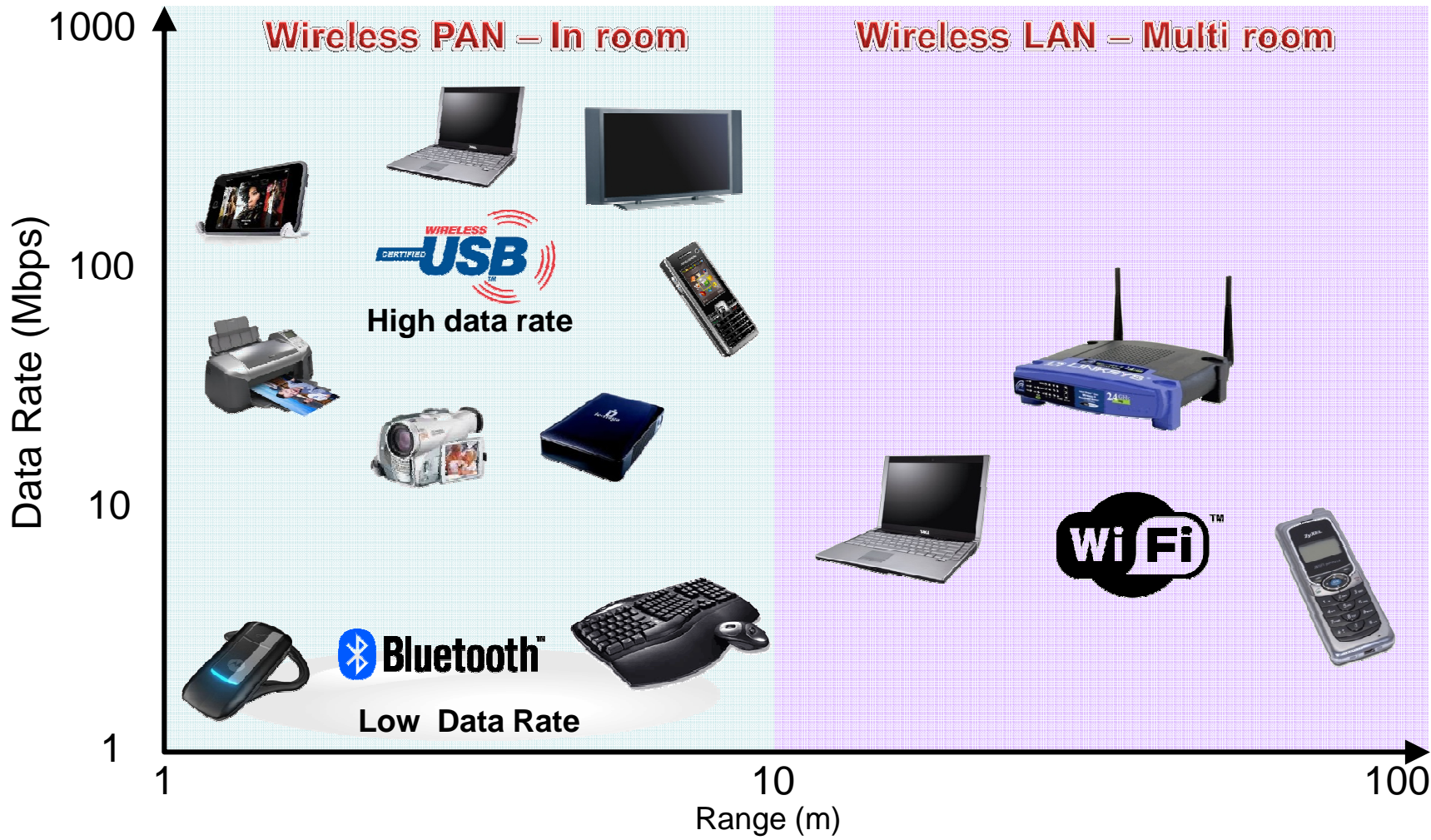
- ▶ Builds on the huge success of the wired USB
  - ▶ The most successful interface ever and most common port in PC platforms and peripherals and penetrating CE devices (HDTV, audio systems, etc')
  - ▶ Over 3 billion wired USB devices shipped in 2008 alone (source: In-stat)
  - ▶ Wireless USB provides the same plug & play user experience but without the limitations of wires
  - ▶ Catering same applications and offers new applications
- ▶ Secured communication with Host & Device pairing mechanisms and AES-128 data encryption



# Where Does Wireless USB Fit In?



Applications that require high data rate and short range (in-room)





## Market and Products Status

# Wireless USB Market Status and Phases



- ▶ Wireless USB products are available in the market
- ▶ Like other wireless technologies, it starts with adapters



802.11b Cardbus



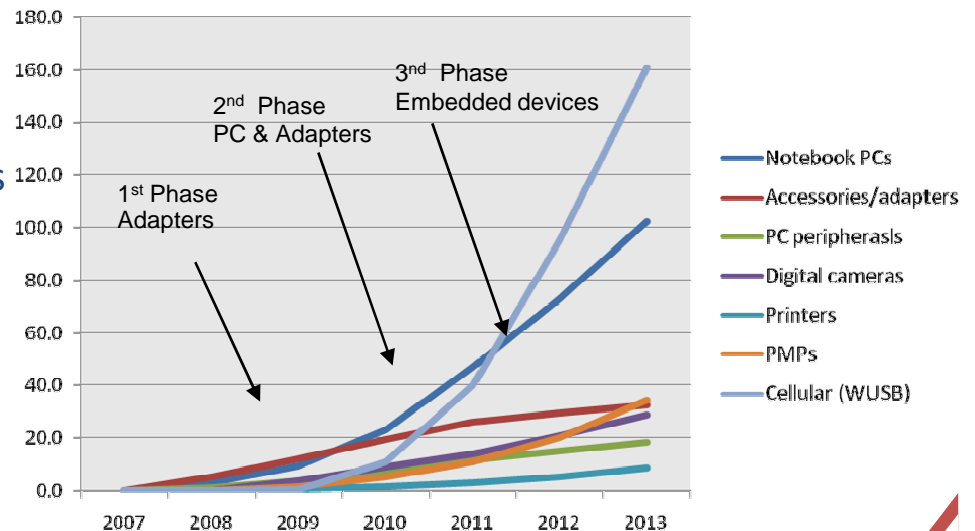
Bluetooth USB Stick



3G Modem USB Stick

## ▶ Wireless USB market evolution:

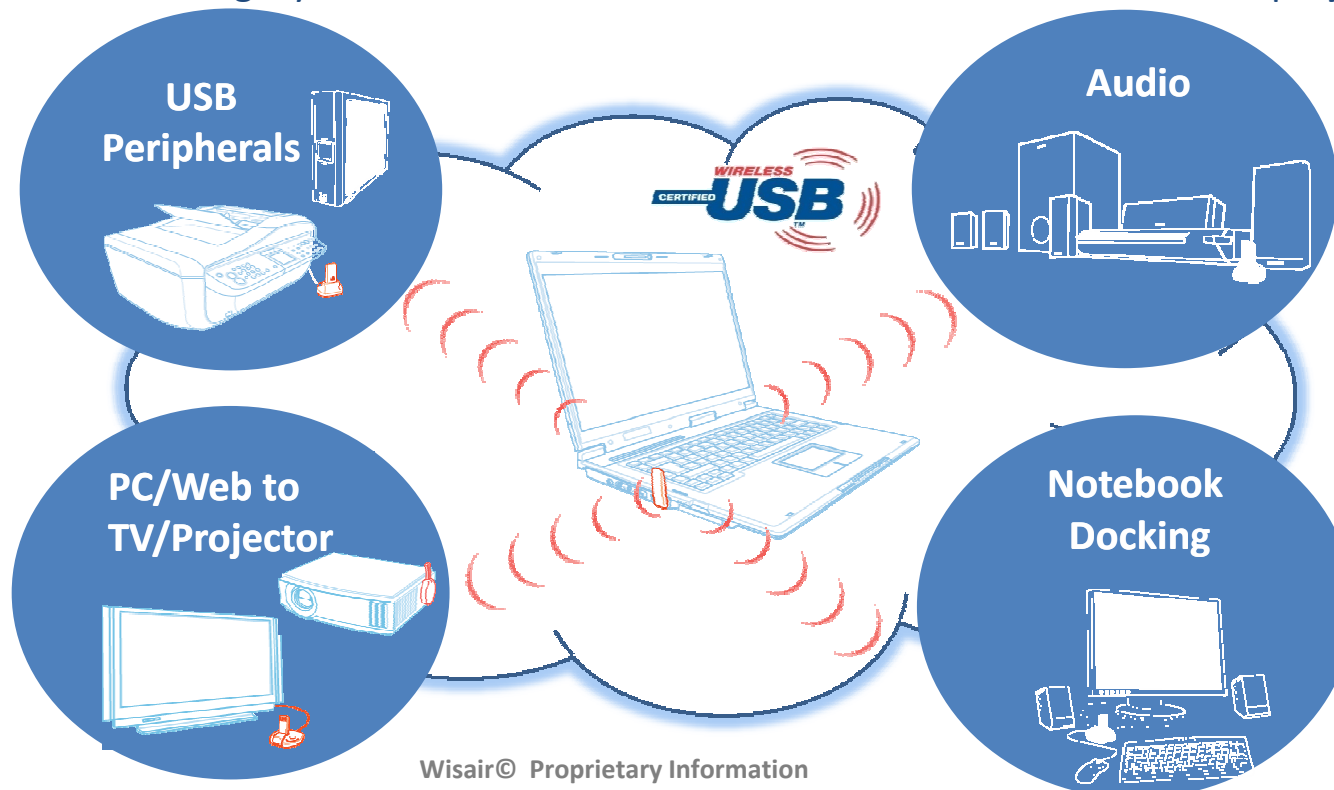
- ▶ Phase 1 (2009) - adapters
  - ▶ Phase 2 (2010) - embedded PC + adapters
  - ▶ Phase 3 (2011) - embedded PC & USB devices
  - ▶ Phase 4 (2012) - embedded CE devices
- ▶ Evolution path also depends on continued regulatory work (e.g. opening more geographic regions for UWB)



# Wireless USB Ecosystem



- ▶ Wireless USB ecosystem is crucial for reaching the embedded market phases
- ▶ A key success factor is offering solutions for appealing applications and attractive use cases, with high performance and reasonable retail price
- ▶ Wisair offers a range of solutions to address huge market segments that include the PC, USB devices, Internet video and audio
  - ▶ Billions of USB legacy devices , 180M PCs , 190M TVs , 170M Monitors, 10M projectors



# Application Example – Wireless PC to TV



## Displaying and sharing wirelessly ANY PC content and Internet on HDTV



Personal/work content (pictures, clips, documents, presentations) – share with your family, friends, colleagues, guests, any type of content you have on your notebook PC...



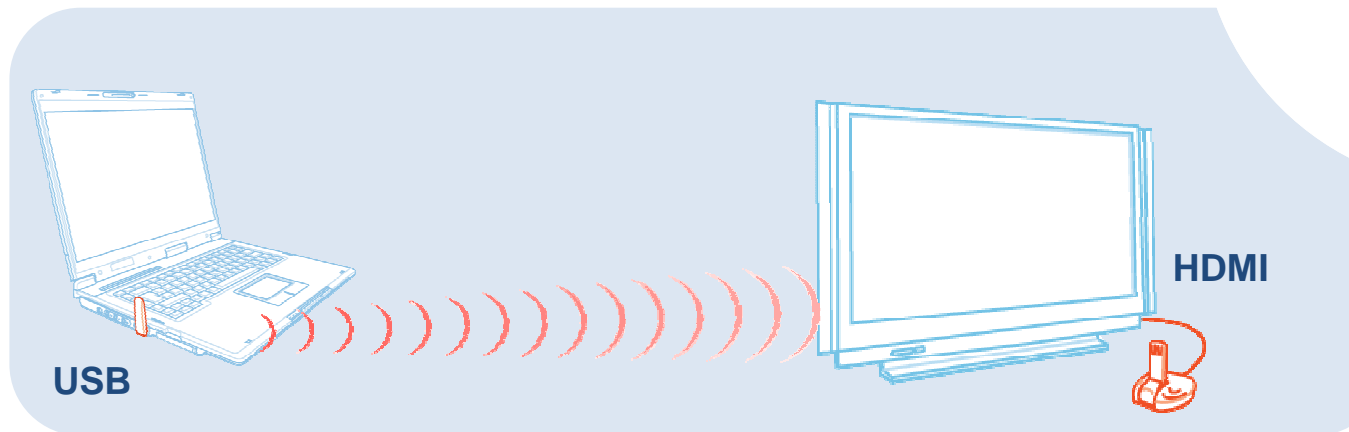
The entire Internet (any web site) without limitations using the regular PC web browsers



# Wireless USB A/V Solution for PC to TV



- ▶ Watch Internet content (Web-to-TV) and PC content (pictures, clips, etc)
- ▶ Support HD Video and High Resolution for Text and Graphics
  - ▶ A/V adaptor interfaces : HDMI (Video , Audio) , VGA, 3.5mm stereo
  - ▶ **Efficient video encoding – no transmission if no changes on the screen !!**
- ▶ Universal Solution to connect PC to TV
  - ▶ PC Adapter connected to a **USB port** (available in **100% of the PCs**)
  - ▶ A/V Adapter connected to **HDMI port** (available in **100% of the HDTVs**)
- ▶ Wireless USB solves a real problem
  - ▶ “USB to HDMI” cable does not exist
  - ▶ Even if it had existed then it wouldn’t have been convenient

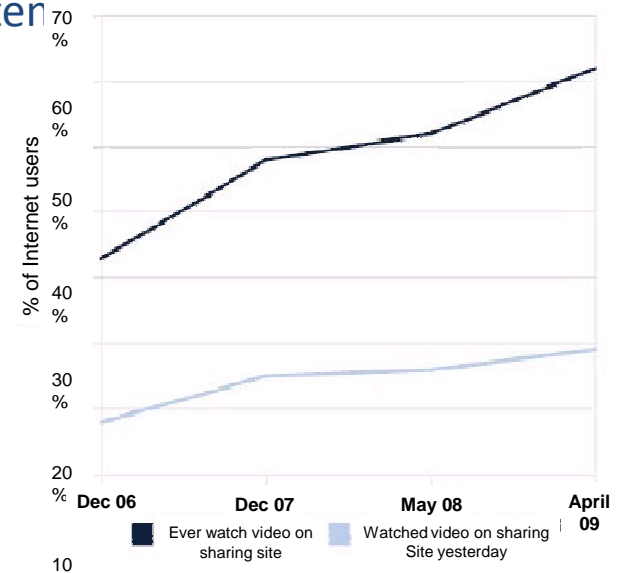


# Market Opportunity (US data)

- ▶ Share of online adults who watch videos **doubled** since 2006
- ▶ Out of 220 Million internet users in US
  - ▶ **77 Million (35%)** of adult internet users are watching movies and TV Shows.
    - ▶ 89% of internet users in ages 18-29 say they watch content on video sharing sites
  - ▶ **17.7 Million (8%)** say they have connected their computer to a television .

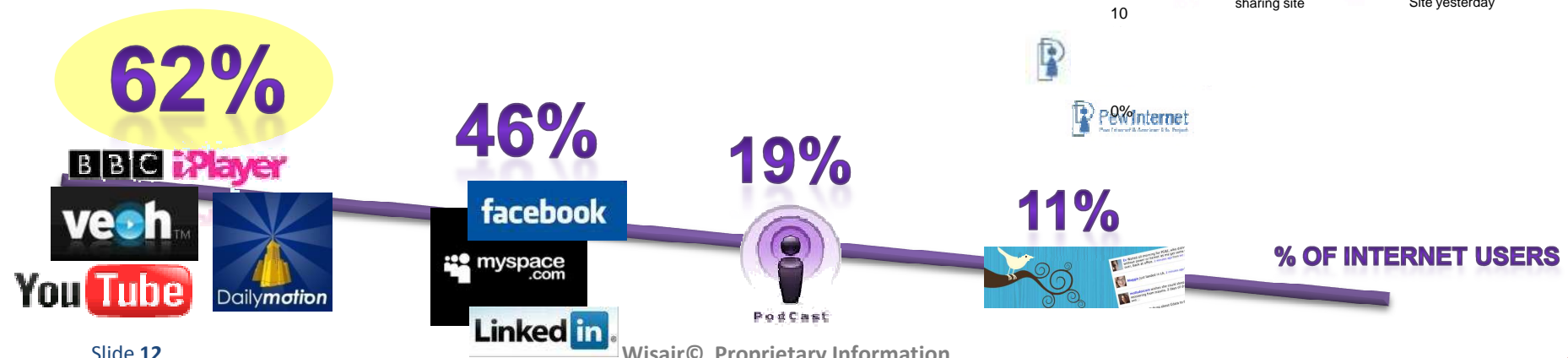
## Use of video-sharing sites nearly doubles from 2006-2009

The percentage of Internet users who watch videos on video-sharing sites



**Source:** "The Audience for Online Video Sharing Sites Shoots Up" report (Pew Internet & American Life Project, **July-2009**)

- ▶ Existing solutions (cable or XBOX) are complicated.
- ▶ **Low cost wireless PC to HDTV connectivity is the enabler !!**





# Products in the Market



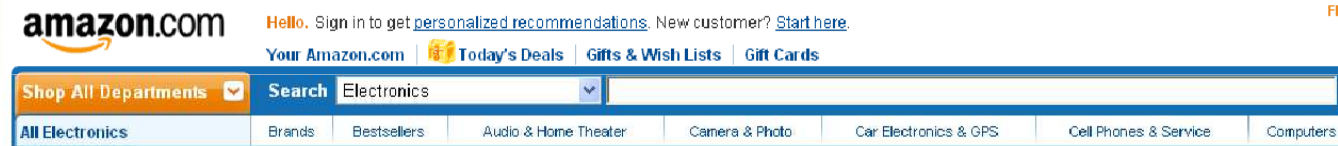
## Wireless USB Display Adapter Set

The Wireless USB Display Adapter set enables users to display their notebook/PC content, such as pictures, movies, presentations and web content, on a larger remote display, share it with others or enjoy a larger size display without any cable limitations. Click any of the logos below to be directed to the retail site.

[amazon.com](#)



Excellent Reviews by Legit Reviews and by Benchmark Reviews (see next slide)



### Warpia Wireless PC to TV/Projector Display Converter Kit

Other products by [Warpia](#)  
 ★★★★★ (8 customer reviews) | [More about this product](#)

Price: **\$129.99** & this item ships for **FREE with Super Saver Shipping**. [Details](#)  
[Special Offers Available](#)

**In Stock.**  
 Ships from and sold by **Amazon.com**. Gift-wrap available.

**Want it delivered Tuesday, August 25?** Order it in the next 35 hours and 50 minutes, and choose **One-Day Shipping** at checkout. [Details](#)



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# Products Gaining Positive Acknowledgement (1)



**Review by Legitreview :**

**See Full Report :**

<http://legitreviews.com/article/1047/1/>

Retailing at \$129.99 shipped, the Warpia Wireless USB Display Adapter is an excellent showcase of an emerging technology...

Overall, the adapter performed excellently with solid throughput of the video content. Build quality was solid and well thought out. With all of the flexible placement options for the adapters, you could tell that much thought went into how the device would be used.

[READ THE FULL REVIEW](#)

The Warpia logo consists of a large, stylized black letter 'W' with three curved lines above it representing a signal or antenna, followed by the word "arpia" in a lowercase, sans-serif font.



**Review by Benchmark Reviews :**

**See Full Report :**

[http://benchmarkreviews.com/index.php?option=com\\_content&task=view&id=352&Itemid=58](http://benchmarkreviews.com/index.php?option=com_content&task=view&id=352&Itemid=58)

**Overall, I was impressed with the ability for such a compact device to reproduce such vivid images and sometimes flawless video almost identical to what the user sees on their PC or notebook screen.** Using extend mode I was able to view multiple sources simultaneously and find out if the Warpia Adapter Set was really up to the task. **Still frame pictures were no problem and reproduced at ease with great quality. Viewing two or three online programs at once worked better than I would have hoped..** for **\$129.99** at Amazon. Compared to similar alternatives, Warpia provides a cost effective, quality product that could be used for both personal and business functions without breaking the bank.



# Products Gaining Positive Acknowledgement (2)



## Atlona AT-HDAiR PC to Monitor/HDTV Wireless Adapter Set

The Wireless USB Display Adapter set enables users to display their notebook/PC content, such as pictures, movies, presentations and web content, on a larger remote display, share it with others or enjoy a larger size display without any cable limitations. Click any of the logos below to be directed to the retail site.

**TigerDirect.com**

**OPENTIP.com**  
Premium shopping. Factory pricing.

**NextDayPC.com**

**FRYS.COM**

**fuzzy Energy**

**Atlona Technologies Wins 2009 EXCITE Award from CustomRetailer for the AT-HDAiR**



**Atlona Technologies, is a finalist in the CE Pro BEST Awards for their AT-HDAiR product**

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Search For:  Keyword or Item #  Sign up for our deal alerts. Email Address

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**More Cables**  
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 HDMI Cables  
 IDE/EIDE Cables  
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 Modem Cables  
 Monitor Cables  
 Network Cables  
 Phone Cables  
 Power Cords  
 Printer Cables  
 PS/2 Extension Cables  
 USB Cables  
 SCSI Cables  
 Security Device Cables  
 Serial ATA Cables  
 New Arrivals

**Limited Warranty**  
 This Item's Warranty is:  
 - 12 Months Parts  
 - 12 Months Labor  
 Warranty provided by - Atlona  
 - View Warranty Info

**You May Also Consider...**  
 # 1

Cables > Adapters / Splitters > Monitor Adapter  
**Atlona AT-HDAiR PC to Computer Monitor/HDTV Wireless Adapter**

Item Number: **A85-1206**  
 Model: **AT-HDAiR**  
 Availability: **Order Today, Ships Today**  
 Original Price: \$179.99  
 Instant Savings: - \$40.00  
**Price: \$139.99**

Quantity    
 Payments as low as \$10 mo.  
 Checkout  **BillMeLater**  
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[Add To My WISH LIST](#)

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 More Monitor Adapter

**Atlona AT-HD500 PC / Laptop to HDMI Converter**  
  
 Now Just **\$189.99**  
  
 More Monitor Adapter

# Wireless Projector by InFocus



- InFocus, a leading projector vendor, has launched a wireless projector series based on Wireless USB
- No need for long VGA cables in the walls and no location limitation inside the meeting room
- The Wireless Display Adapter is embedded inside the projectors
- 30% of the projectors are supported now and soon will be increased to 60%



**IN3100**



**IN1100**



**InFocus Wireless Projector**

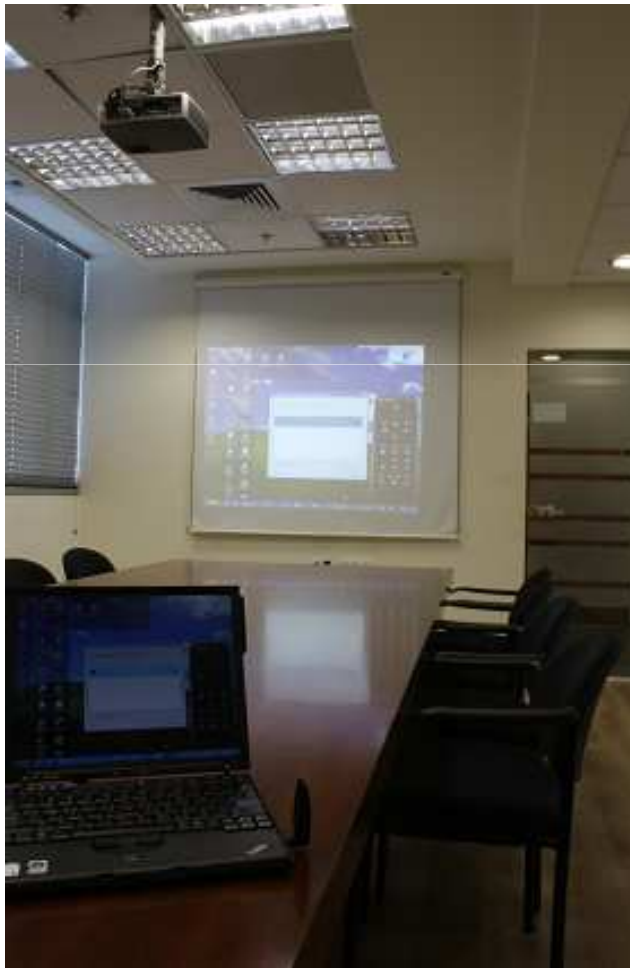
**InFocus®**



# Wireless Projector – The Use Case



- Wireless connectivity in meeting rooms / classrooms
  - Replace multiple cables by wireless : Video , Audio and HID (e.g. projector control)





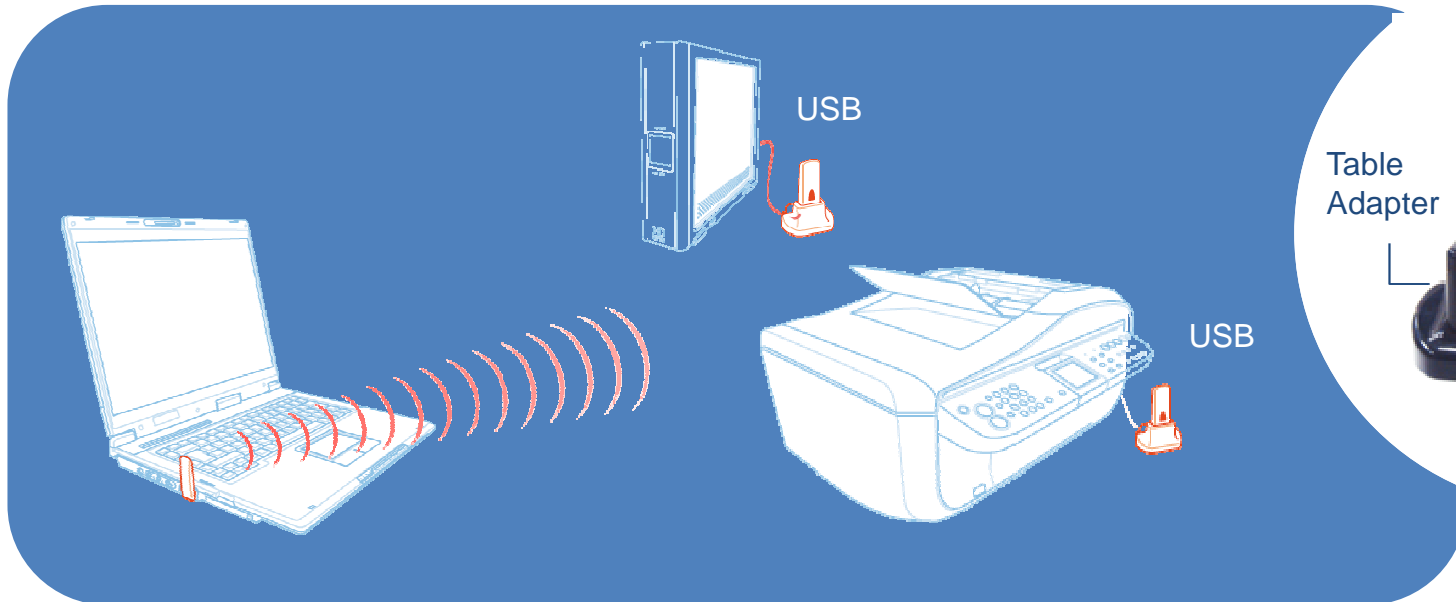
# Wireless USB Generic Adapter Set



- ▶ 'Upgrade' existing legacy USB devices to Wireless USB
- ▶ Connect to Device USB port - No need install any driver at the Device side
- ▶ Eliminates cable clutter and place peripherals anywhere in the room
- ▶ Retail bundling with USB devices  
e.g. Buy.com (with 1TB HDD):



**Buy.com**





# Wisair Single Chip Based Products - Examples



Witech Wireless Monitor



Hama Generic Adapter



Fujitsu Generic Adapter



Display Solutions Wireless Monitor



Warpia Display Adapter



InFocus Wireless Projector



Olidata Generic Adapter



XEL Generic Adapter



Cables Unlimited Generic Adapter

Wireless USB Adapter Set

The Wireless USB adapter set allows users to turn their existing USB devices to Wireless USB—eliminating USB cables and increasing the convenience of Wireless USB. Click one of the logos below to be directed to the retail site.

TigerDirect.com

COMPUSA.com

Buy.com

amazon.com

RitzCamera.com & Electronics.com



WOLF CAMERA.com

STAPLES

Verbatim



CABLES UNLIMITED



Slide 19 Atlona AT-HDAir Kit

More to be launched soon...

Wisair© Proprietary Information



# Additional Wireless USB Adapters and PCs Examples



IOGear Wireless VGA & Audio



iMation Wireless VGA



CablesToGo Wireless VGA & Audio



Toshiba Docking Station



Fujitsu Amilo Xi 3670



Lenovo X300



Dell Latitude E6400





# USB-IF Support in Wireless USB Promotion



Products Promotion in USB-IF Home page



Product Promotion Programs with Leading Retailers

Promotion in Trade-Shows Worldwide



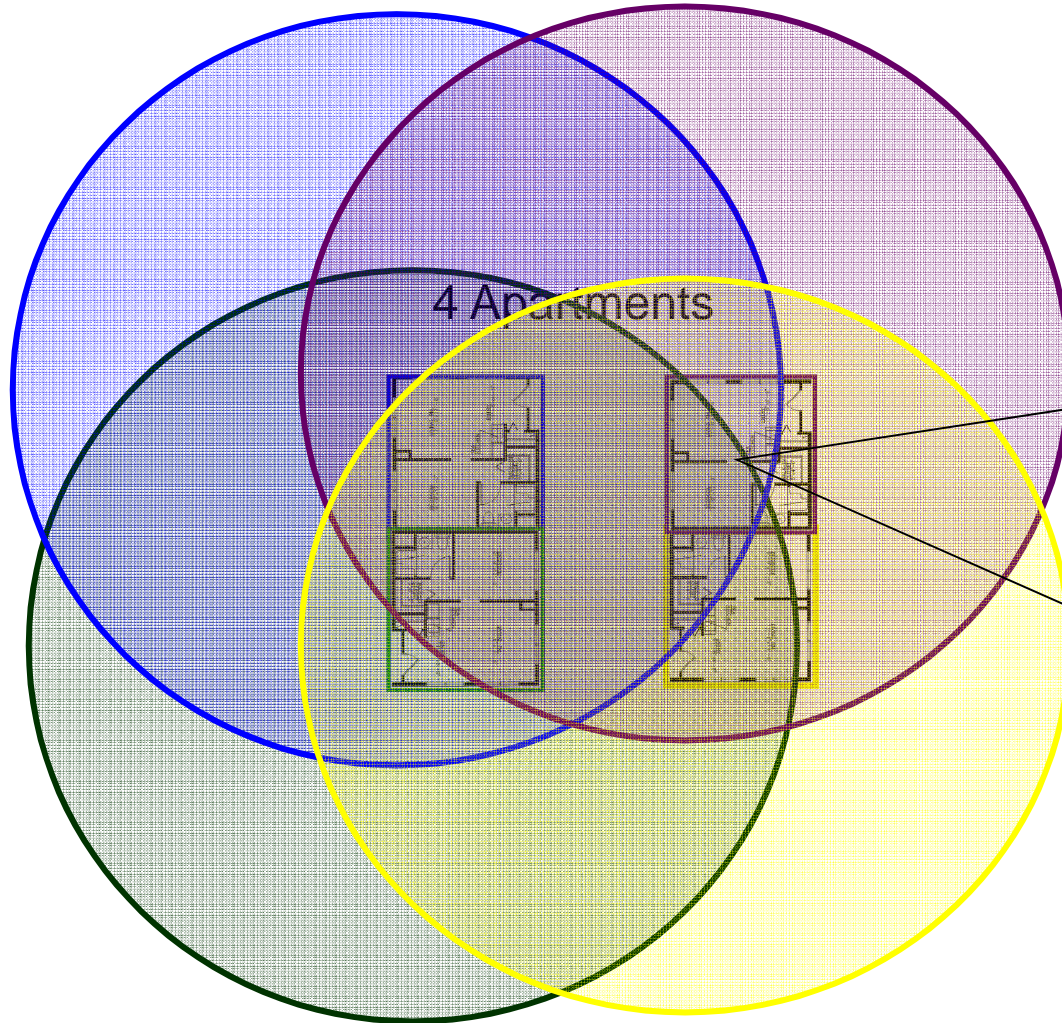

Promotion in Magazines and Publications



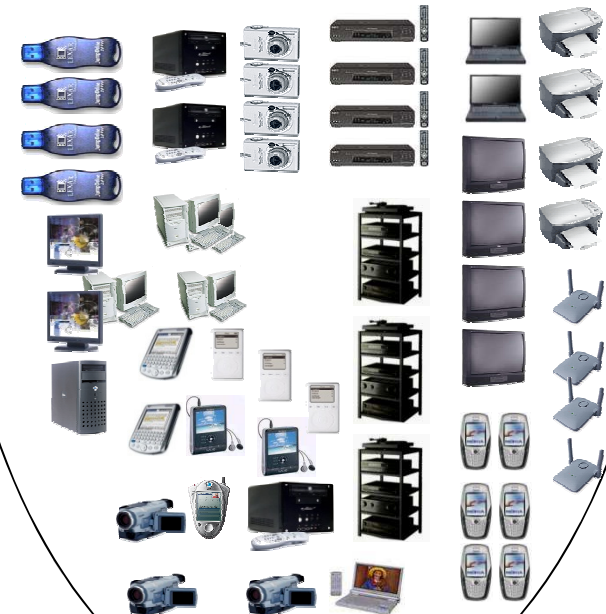


## WiFi Complimentary Model

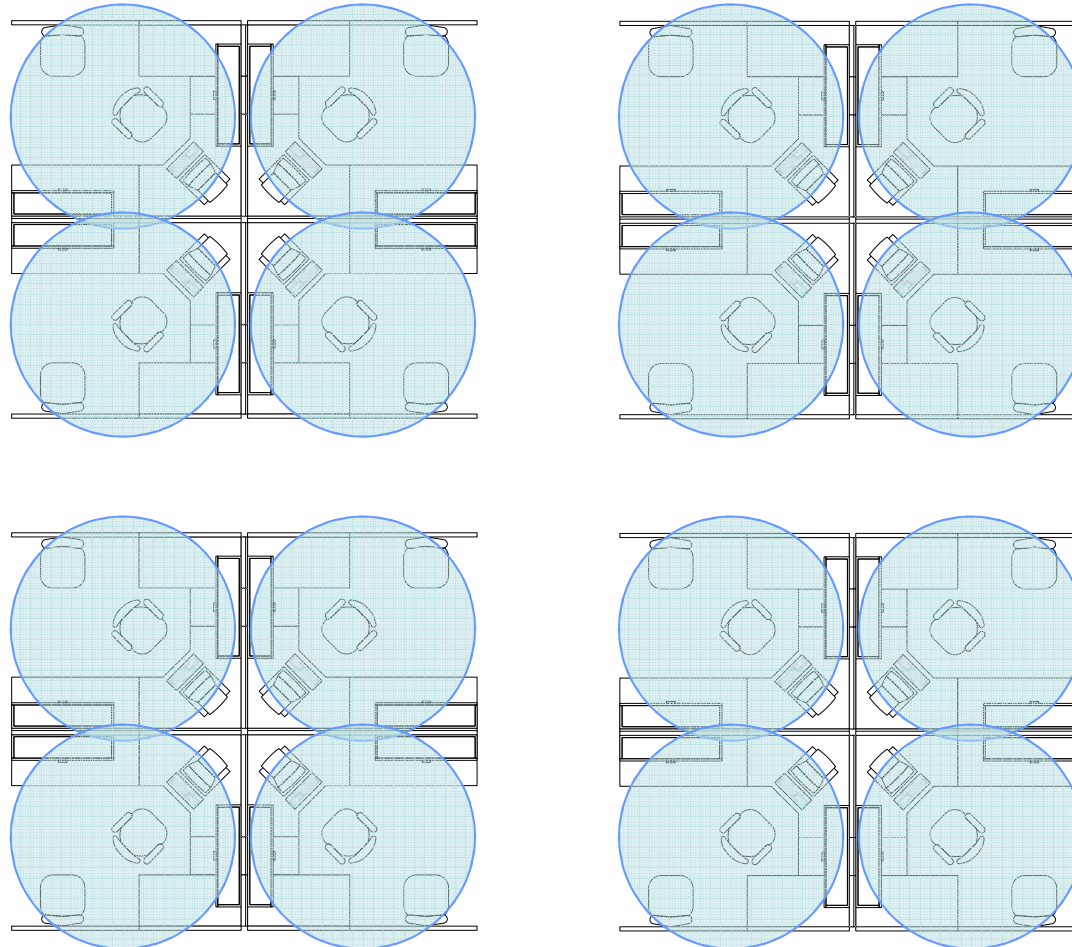
# Wi-Fi Range is a Drawback for PAN



Which of the following available devices would you like to connect to?



# UWB Has Superior User Density



# WiFi - Complementary Usage Model (1)



- Wireless USB provides high-speed low-power connection to peripherals
- Wi-Fi provides connection to internet
- Wi-Fi is bandwidth limited for both WPAN and WLAN connectivity





## Wi Fi - Complementary Usage Model (2)



- Wireless USB provides high-speed low-power video stream
- Wi-Fi provides connection to internet (e.g. YouTube)
- Wi-Fi cannot sustain bandwidth and QoS for both





What's next?

# Expediting and Increasing Market Adoption (1)



## ▶ How can vendors and OEMs contribute?

- ▶ Offer solutions for more appealing applications and more attractive use case, by addressing real needs of end users
- ▶ Provide high performance embedded solutions for PC and later for the device side
- ▶ Drive the cost low to enable reasonable end products price

## ▶ How can regulators help?

- ▶ UWB regulations in additional regions - open more geographical markets
  - ▶ Worldwide regulations are a key success factor and key issue for standardization bodies and OEMs alike (notebook PCs, mobile devices, mobile phones, etc')
- ▶ Make the entire band of BG1 (below 6GHz) usable in all regions using DAA
  - ▶ Great progress has been made but it is required to complete the DAA effort (e.g. Japan & China)
- ▶ Harmonize the above 6GHz bands (e.g. Japan)
- ▶ Finding ways to allow more power to be transmitted by UWB devices (see next slide)
- ▶ Continue the collaboration with the UWB industry to make UWB usable in commercial level while keeping the required balance with other regulatory needs (e.g. walter)





# Expediting and Increasing Market Adoption (2)



## ▶ Finding ways to allow more power to be transmitted by UWB devices

- ▶ Allowing UWB devices to transmit more than -41.3 dBm/MHz if it can demonstrate that it is far enough from the potential victim receiver
  - ▶ e.g. allow -31.3 dBm/MHz if the UWB device can lower the detection threshold by 10 dB
  - ▶ Same protection level, improved UWB user experience
- ▶ Allow more power above 6GHz according to the link loss which reduces the interference to potential victim receivers
  - ▶ e.g. 6dB at 6GHz and 9dB at 9GHz
  - ▶ Same protection while making above 6GHz as good as below 6GHz
- ▶ The best thing would be a worldwide UWB band above 6GHz in which a higher signal can be transmitted
  - ▶ e.g. -20 dBm/MHz between 7.25 GHz and 8.5 GHz
  - ▶ Will enable higher throughput, higher capacity, robust link --> new applications, more products, wider deployment



