

UMPCs get a direct connection to users' primary PCs

By Alex Chow



Photo courtesy of TabletKiosk, www.tabletkiosk.com

With this issue's focus on desktop trends hitting small form factors, we sought out articles that explore how USB technology has affected small form factor and mobile device designs. Alex provides a perspective on how USB used in client mode can increase the usefulness of an Ultra Mobile PC (UMPC).

Among today's trends, two are apparent everywhere: people are more mobile now than they used to be and they love their gadgets. Because of these cultural developments, designers are creating smaller and lighter devices that can be carried on the go. This migration to smaller form factors is evident in devices like cell phones, MP3 players, cameras, and most recently, mobile PCs.

For many years, the term "mobile PC" has commonly referred to either a laptop or notebook PC. Then the Tablet PC was introduced, but due to its similar size and function, it is categorized as a notebook PC, just with a different user interface. Today, new categories of recently introduced mobile PCs are revolutionizing both form and function. The UMPC and Mobile Internet Device (MID) are new mobile PC systems that look nothing like the traditional notebook PC. To better understand the application and potential these new devices are creating for the mobile PC market, this article will take a deeper look at UMPC and MID designs.

Different types of mobile PCs

The traditional notebook PC is a portable PC with a display usually ranging between 14" and 20", full keyboard, mouse or touchpad, and optical (CD/DVD) drive. The notebook PC is equipped with the latest CPU, graphics, and wireless networking technologies. It runs a full, mainstream Operating System (OS) such as Microsoft Windows Vista and can support many different software applications. Battery life is sufficient to last a few hours before having to plug in an AC adapter. The notebook PC is usually a user's primary PC, equipped for productivity in both stationary and mobile environments.

The UMPC was designed with mobility and instant productivity in mind. Many UMPCs feature a 7" screen, small built-in

or onscreen keypad, and stylus or touch knob for a pointing device. The UMPC supports Wi-Fi and an RJ-45/Ethernet port for Internet connectivity and Bluetooth for other peripheral connections. UMPCs usually run a full, mainstream OS and incorporate technologies that allow users to run familiar applications and read e-mails, edit documents, and so on. Battery life is optimized for up to six hours so users can enjoy digital media and browse the Web anywhere there is a hot spot.

The MID is similar in form to the UMPC, sporting an average 5" screen. Since it doesn't run a full OS, it typically isn't associated with an actual mobile PC. Instead, it is a simple device that provides quick Internet access. MIDs usually run simple Linux-based applications for Web browsing and media playback. Introduced more recently than the UMPC, the MID hasn't gained much traction, so the market's focus at this point is on the UMPC.

UMPC versus the notebook PC

Since UMPC's introduction, the market has responded with many new and creative designs that look different from the traditional notebook PC. Some important questions then arise: How does the UMPC fit in with the notebook PC? More importantly, how will a UMPC work with a notebook PC?

To answer these questions, compare a notebook PC and UMPC to see how they're built and what they can and cannot do well (see Table 1).

Looking at this comparison, the UMPC shows some key advantages in the area of mobility. It has the technologies to connect to the Internet, is lightweight, and has a long battery life. However, there are areas in which the UMPC is lacking some key components, preventing it from being a user's only computer. For example, when a user is stationary either at home or the office, the UMPC's mobile advantages fade, and its weaknesses – small screen size, hard-to-use keyboard and mouse, and lack of peripheral support – become apparent.

The UMPC is a great PC companion, but a not-so-great primary PC; therefore, it must be able to interact with a user's primary PC to allow data syncing and leverage the primary PC's cutting-edge technology and peripherals.

USB technology double play

The most efficient way to connect a UMPC with a user's primary PC is via

	Notebook PC	UMPC
Display	14" to 20"	7"
User interface	Standard keyboard and mouse	Built-in keypad and stylus
Peripherals	CD/DVD drive, many peripheral extensions	No optical drive, Bluetooth, limited ports for peripherals
Technology	Optimized for performance (fast CPU, graphics)	Optimized for mobile connectivity (Wi-Fi, Bluetooth)
Battery life	2-3 hours maximum	5-6 hours maximum
Weight	4-6 pounds	3-4 pounds

Table 1

USB. Hi-Speed USB 2.0 is widely adopted by the consumer market. By adding a USB client port to the UMPC, it can easily connect to the user's primary PC and other USB hosts for syncing digital media libraries, e-mail, and various office documents.

USB Duet Technology combines both hardware and software that enable UMPC interaction with the primary PC by adding a USB client port to the UMPC, allowing the port to have multiple functions such as sharing files and peripherals. Its familiar usage models such as mass storage and plug-and-play capabilities allow instant usability.

The USB 2.0 protocol follows a host-to-client/device model. A standard USB cable always connects a USB host to a client; there is no peer-to-peer communication in USB. USB host (Type A) ports are everywhere, supported by all PCs today and on many set-top boxes and gaming consoles. With so many USB hosts in the market, the ability to connect a UMPC to any of these USB host systems is important to obtain.

Today's PC-to-PC connectivity has been heavily dependent on TCP/IP or Ethernet. Though TCP/IP is disadvantageous in its complex configuration, security holes, and slow performance especially over Wi-Fi, USB Duet helps resolve these problems. It is simple, secure, and takes advantage of Hi-Speed USB 2.0's high performance.

Using a standard USB cable, a UMPC can connect and transfer files to other USB hosts at 480 Mbps. Since the connection is fully visible via a physical USB cable, it is 100 percent secure. Finally, USB's plug-and-play feature enhances the mobile nature of the UMPC; users can simply connect the USB, sync, and go. However, the USB cable alone will not perform this seemingly simple function, necessitating enhanced driver applications.

Making use of existing PCI-to-USB bridging technology, the peripheral controller easily connects to a UMPC system's PCI bus to provide a USB client port while the software adds more value and flexibility to the USB client port on mobile PCs and UMPCs.



Figure 1

Mass storage, migration, and docking applications

One such application, USB Duet HD, turns a UMPC into a mass storage device for data backup and file sharing between a UMPC and its primary PC. Just plugging in the USB cable allows users to immediately start sharing files or backing up data directly, with no drivers needed (see Figure 1). In a sense, it works just like a USB flash drive.

Another valuable UMPC application is docking. USB Duet EZ-Dock allows users to easily share their primary PC's peripherals with UMPCs. By plugging in the USB cable, a user can work on a UMPC at the comfort of his/her desk with a large LCD monitor, full keyboard, and mouse, and share an optical drive with the UMPC, allowing new software applications to be installed easily.

Now, revisiting the previous comparison between a notebook PC and UMPC, note how USB Duet can help resolve the shortcomings of a typical UMPC (see Table 2).

Technologies that address both the rapidly growing community of mobile computing users and the increasingly smaller computer platforms are now beginning to see penetration at multiple levels. While the next-generation USB standard is presently in the specification stage, making it premature to make predictions, users can anticipate that this venerable, highly versatile connectivity standard will continue to embrace enhanced USB controller technologies. ➤



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	Notebook PC	UMPC with USB Duet
Display	14" to 20"	Shares primary PC's large LCD display
User interface	Standard keyboard and mouse	Shares standard keyboard and mouse
Peripherals	CD/DVD drive, many peripheral extensions	Shares primary PC's peripherals
Technology	Optimized for performance (fast CPU, graphics)	Shares primary PC's graphics
Battery life	2-3 hours maximum	5-6 hours maximum
Weight	4-6 pounds	3-4 pounds

Table 2