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Scanners and Digital Cameras

This chapter presents the PC 98 requirements and recommendations for still-image devices, specifically digital cameras and scanners, including sheetfed, flatbed, handheld, and film-scanning devices.

The still-image device market is growing rapidly in the consumer and mass-market segments, stimulated by applications such as Internet authoring and home publishing, and by the availability of low-cost, high-resolution color printers. For PC 98, the important design issues include the following:

- Increased image-resolution quality at consumer price points
- Incorporation of new bus standards such as USB and IEEE 1394 into still-image peripheral devices
- Integration of a fast transfer mechanism for non-tethered devices such as digital cameras
- Improved ease of connectivity and installation for the end user—that is, by reducing components to be installed, such as power supplies and add-on cards, by simplifying the installation procedure to limit the number of user responses required, and by ensuring compliance with Plug and Play requirements
- Incorporation of color-calibration support across devices
- Implementation of push-model behavior, where events are triggered based on user-initiated actions at the device, such as inserting paper or pushing a button

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Scanner and Digital Camera Basic Features

This section summarizes the basic PC 98 hardware requirements for scanners and digital cameras.

1. Device uses PC 98 compatible port connection
Required

Recommended: IEEE 1394 connection.

No legacy or proprietary solutions are acceptable for PC 98.

2. Icons provided for port and peripheral connectors
Required

To ensure proper connection by the user between cable and connector, an icon or text identifier must be added to any external connector, using vendor designs or the icons provided in the "Icons" appendix in the References part of this guide. The icon can be molded into or printed on the plastic (either by stamping or by affixing as a permanent sticker).

3. Device supports ICC color matching
Required

Windows and Windows NT support using color profiles that comply with the ICC Profile Format specification. All color output from still-image devices must be defined. The device either must create sRGB output or must embed the ICC profile for the newly acquired image into the image file to identify the color-space information for that image.

For contact information on device profiles, see the references at the end of this chapter. The ICM APIs and functionality for Windows and Windows NT are described in the Win32 SDK and the Windows NT 5.0 DDK.

For PC 98, color-capable devices such as desktop monitors, printers, scanners, still-image cameras, LCDs, color plasma displays, or other flat-panel devices are required to install one or more ICC profiles for ICM. Providing a monitor color-calibration utility is recommended for generating, editing, and installing ICC profiles. The sRGB profile will be distributed in Windows and Windows NT.

4. IR device meets PC 98 IR requirements
Required

For imaging devices that include an IR interface, all IR hardware must at minimum comply with the IR requirements defined in the "I/O Ports and Devices" chapter in Part 3 of this guide.

5. SCSI device meets PC 98 SCSI requirements
Required

All SCSI hardware must comply with the requirements defined in the "SCSI" chapter in Part 3 of this guide. This ensures complete Plug and Play capabilities with SCSI hardware. For example, a user must be able to attach any SCSI peripheral on a system with SCSI support. The operating system should automatically recognize it, load and initialize the appropriate drivers, and then make the device available for use.

6. SCSI device attaches to any PC 98-compliant SCSI controller
Required

All SCSI scanners must be able to attach successfully to any SCSI controller that meets the PC 98 requirements defined in the "SCSI" chapter in Part 3 of this guide.

7. USB device meets PC 98 USB requirements
Required

All USB hardware must comply with the requirements defined in the "USB" chapter in Part 3 of this guide, which includes the USB specifications for specific device types. This ensures complete Plug and Play capabilities with USB hardware and meets all the core and device requirements for USB. For example, a user must be able to dynamically attach any USB peripheral to any USB connector. The operating system should automatically recognize the device, load and initialize the appropriate drivers, and then make the device available for use.

All devices must comply with the requirements defined in the *USB Imaging Class Specification*, and drivers must be implemented under the WDM Still Image architecture, as defined in the Windows NT 5.0 DDK.

8. USB device supports string descriptors
Required

The device descriptor, as listed in Section 9.6.1 of the USB specification, must have valid iManufacturer and iProduct string descriptor indexes. All USB scanners must comply with requirements defined in Sections 9.4.3 and 9.6.5 of the USB specification.

9. IEEE 1394 device meets PC 98 requirements for IEEE 1394
Required

All IEEE 1394 hardware must comply with the requirements defined in the "IEEE 1394" chapter in Part 3 of this guide.

PC 98 Design for Scanners and Digital Cameras

This section summarizes requirements related to the PC 98 design initiatives described in Part 1 of this guide.

Plug and Play for Scanners and Digital Cameras

The items in this section are requirements for Plug and Play capabilities. For Plug and Play requirements related to parallel ports, see the "I/O Ports and Devices" chapter in Part 4 of this guide or the related bus port requirements in Part 3 of this guide.

10. Plug and Play capabilities implemented for all supported buses
Required

Complete Plug and Play capabilities must be implemented for all buses that the device supports. For information about the Plug and Play requirements, see the related bus requirements in Part 3 of this guide.

11. Each device has a Plug and Play device ID
Required

All devices for all buses must supply a human-readable device ID in the manner required for the bus it uses. The device ID requirements for each bus type are defined in Part 3 of this guide; however, the device ID requirements for devices that use parallel ports are defined in the IEEE 1284 specification, as summarized in the "I/O Ports and Devices" chapter in Part 4 of this guide.

Scanner and Digital Camera Power Management

This section summarizes the specific power management requirements for scanners and digital cameras.

12. Device supports power management requirements for its bus
Required

The device must support the power management requirements for the bus it uses, as defined in Part 3 of this guide.

Device Drivers and Installation for Scanners and Digital Cameras

This section summarizes the device driver requirements for scanners and digital cameras.

13. Device drivers and installation meet PC 98 requirements
Required

The manufacturer does not need to supply a driver if a PC 98-compliant driver provided with the operating system can be used. If the manufacturer supplies a driver, the requirements for the device drivers and installation are defined in the "Basic PC 98" chapter in Part 2 of this guide. The basic requirements include driver support for unattended installation and Help file support if special driver parameters are used.

14. Driver support is implemented under Still Image architecture
Required

Still image devices such as scanners and digital cameras must use the Still Image architecture based on WDM. Still digital cameras capable of creating video streams also must provide a WDM minidriver based on WDM Stream class support.

For information about Still Image architecture and WDM support, see the Windows NT 5.0 DDK. See also the related articles on the web site at http://www.microsoft.com/hwdev/pcfuture/.

15. Applications provided with the device meet Win32 specifications
Required

Any Windows-based applications provided with the device must meet Microsoft requirements for software compatibility as defined in the Win32 SDK.

Scanner and Digital Camera References

The following represents some of the references, services, and tools available to help build hardware that is optimized to work with Windows operating systems.

Device class power management reference specifications
    http://www.microsoft.com/hwdev/onnow.htm

International Color Consortium (ICC)
ICC Profile Format Specification
    http://www.color.org

Plug and Play specifications
    http://www.microsoft.com/hwdev/specs/

Universal Serial Bus Specification, Version 1.0
USB Imaging Class Specification
    Phone: (503) 264-0590
    Fax: (503) 693-7975
    http://www.usb.org

WDM device driver support and WDM Still Image architecture white papers
    http://www.microsoft.com/hwdev/pcfuture/

Windows and Windows NT DDKs and Win32 SDK
    MSDN Professional membership

Checklist for Scanners and Digital Cameras

If a recommended feature is implemented, it must meet the PC 98 requirements for that feature as defined in this document.

1. Device uses PC 98 compatible port connection
Required

2. Icons provided for port and peripheral connectors
Required

3. Device supports ICC color matching
Required

4. IR device meets PC 98 IR requirements
Required

5. SCSI device meets PC 98 SCSI requirements
Required

6. SCSI device attaches to any PC 98-compliant SCSI controller
Required

7. USB device meets PC 98 USB requirements
Required

8. USB device supports string descriptors
Required

9. IEEE 1394 device meets PC 98 requirements for IEEE 1394
Required

10. Plug and Play capabilities implemented for all supported buses
Required

11. Each device has a Plug and Play device ID
Required

12. Device supports power management requirements for its bus
Required

13. Device drivers and installation meet PC 98 requirements
Required

14. Driver support is implemented under Still Image architecture
Required

15. Applications provided with the device meet Win32 specifications
Required