



USB Flash Drive Usage with Windows® CE

White Paper 312

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Abstract

When using Logic Product Development's hardware running Windows® CE, USB flash drives – also known as Disks on Key (DOK) – with storage space greater than 128MB may not be recognized as accessible drives.

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REVISION HISTORY

REV	EDITOR	DESCRIPTION	APPROVAL	DATE
A	Jed Anderson	Release	HAR	1/13/2006

1 Introduction

When using Logic Product Development's hardware and running Windows® CE, USB flash drives – also known as Disk on Key (DOK) devices – may not be recognized as accessible drives depending on their size and other factors.

This paper does not apply to Logic hardware that utilizes USB 2.0 or hardware running operating systems other than Windows CE versions 5.0 or earlier.

2 Overview

It has been observed that a variety of USB flash drives do not work or initialize properly with devices running the Windows CE operating system. This issue is not confined to a specific version of Windows CE, or a specific hardware architecture. It has been observed on CEPC, SH4, SH3, ARM9, and XScale platforms when running Windows CE 5.0 and earlier. The problem appears to be located in the Windows CE mass storage device driver. The problem is not a file system limitation, as CompactFlash® cards as large as 4GB have been used without a problem.

3 SCSI Sense Commands

The USB mass storage class implemented in Windows CE uses the SCSI transparent common set subclass – including the SCSI Mode/Get Sense commands. Some USB devices utilize firmware that does not support these commands. These commands cause unsupported devices to stop responding. A fix involves avoiding ScsiModeSense6 and ScsiModeSense10 calls for the devices that are not recognized by Windows CE. By not using these commands in the mass storage class driver, some USB devices can be made to be recognized by the operating system and will work properly.

4 Further Information

The following is taken from an MSDN chat:

Q: For USB, there used to be bugs with the USB Storage Class Driver, where some usual brand names of USB flash key don't work. Is it still the case? Also, it used to take a long time for USB flash key to appear on windows explorer for many USB flash key.

A: With respect to the first question, this is still the case. The driver isn't robust enough to deal with general command set and timing disparities across the whole gamut devices. To partially mitigate the timing issues, we've exposed all of the timing parameters associated with the driver under the following registry keys:

[HKEY_LOCAL_MACHINE\Drivers\USB\ClientDrivers\Mass_Storage_Class\2]

[HKEY_LOCAL_MACHINE\Drivers\USB\ClientDrivers\Mass_Storage_Class\6]

We've found that mucking with the UnitAttnRepeat registry value can solve some of the timing issues associated with large keys. There's a note in common.reg that says that this value should be reduced from 10 (0xA) to 1 for large USB keys.