VESA®

Video Electronics Standards Association

VBE/DDC™ Standard

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VESA BIOS Extensions/Display Data Channel Standard

Version: 1.1
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Purpose

To establish a standard set of hardware-independent system services for reading the Display Identity via the Display Data Channel (DDC).

Summary

The VBE/DDC standard defines a set of functions to retrieve the EDID data structures from the display over the Display Data Channel. These functions supplement the VESA Video BIOS Extensions (VBE) normally provided in ROM with the display controller and accessed through interrupt 10h.

The hardware mechanism and the identity information content that can be retrieved from the display devices are defined by the VESA Display Data Channel (DDC) standard.

Version 1.1 of this document enables the reading of EDID Extension blocks as defined in the Enhanced DDC and Enhanced EDID Standards, while keeping the software interface backward compatible.

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Support for this Standard

Clarifications and application notes to support this standard may be written. To obtain the latest standard and any support documentation, contact VESA.

If you have a product, which incorporates VBE/DDC, you should ask the company that manufactured your product for assistance. If you are a manufacturer, VESA can assist you with any clarification you may require. All comments or reported errors should be submitted in writing to VESA using one of the following methods.

- Fax :   (408) 957-9277, *direct this note to Technical Support at VESA*

- e-mail: support@vesa.org

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Version 1.0
Anders Frisk, ICL Personal Systems   Tim Crawford, Cirrus Logic

Version 1.1
Jack Hosek, NEC   Anders Frisk, Nokia Display Products

Document revision history

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Standard version 1.1, November 18, 1999
Removed 3.2.201 Read EDID/Input Wording: "Zero is the only valid value in version 1.0".
Removed VDIF Read-Sub Function
Section 3.2, Clarification of the term "Controller unit number"

Table of Contents

1. Introduction

This document contains a specification for an application interface - VBE/DDC. The VBE/DDC interface will allow operating system software, as well as application software, to retrieve the display identity information from the display device without specific hardware knowledge or direct hardware access. The hardware protocol for retrieving the identity from the display is described in the VESA Standard Enhanced DDC.

Readers of this document should already be familiar with the VESA Video BIOS extensions and programming video hardware at BIOS level. The VESA Video BIOS extensions are defined by the VESA VBE Specification available from the VESA office.

2. Goals and Objectives

The VESA Display BIOS Extensions/Display Data Channel (VBE/DDC) provides a hardware-independent means for operating system software and configuration utility software to retrieve identity and capabilities information from the attached display.

VBE/DDC services need to be provided as part of the Video BIOS ROM, since the functions need to be used during system boot up.

VBE/DDC services can be implemented with a standard VGA BIOS, and do not require the support of other VESA VBE Video BIOS services.

3. Display Identification BIOS Extensions, VBE/DDC

The new BIOS calls have been defined to map to both standard VGA BIOS, as well as all implementations of a VESA VBE BIOS. For compatibility with these environments, the VBE/DDC function calls are grouped under the VBE function number *4Fh,* sub-function *15h*. The number *4F15h* is passed in the AX register to the *int 10h* interrupt handler.

3.1 Status information

Every function returns status information in the AX register. The format of the status word is as follows:

AL ==4Fh:Function is supported
AL !=4Fh:Function is not supported
AH ==00h:Function call successful
AH ==01h:Function call failed

Software should treat a non-zero value in the AH register as a general failure condition. In later versions of VBE or VBE/DDC, new error codes might be defined. Refer to the VBE Standard documentation.

3.2 VBE Sub-function 15h - Display Identification Extensions

The VESA VBE sub-function 15h is used to implement the VBE/DDC services. The VBE/DDC services are defined below and are not included in the VBE Standard documentation.

3.2.1 00 - Report VBE/DDC Capabilities

Input:

AH= 4fh	VESA Extension
AL= 15h	**VBE/DDC Services**
BL = 00h	**Report DDC Capabilities**
CX = 00h	Controller unit number (00 = primary controller) (*)
ES:DI	Null pointer, must be 0:0 in version 1.0 Reserved for future use.

Output:

AX=	Status
BH=	Approx. time in seconds, rounded up, to transfer one EDID block (128 bytes).
BL =	DDC level supported (**)
bit 0	= 0 DDC1 not supported
	= 1 DDC1 supported
bit 1	= 0 DDC2 not supported
	= 1 DDC2 supported
bit 2	= 0 Screen not blanked during data transfer (***)
	= 1 Screen blanked during data transfer
CX =	Unchanged
ES:DI	Unchanged

All other registers may be destroyed

(*) This refers to the monitor port number. When version 1.0 of the document was developed it was assumed that one graphics controller had only one monitor port. Later controller designs have multiple monitor ports per graphics controller. This parameter selects the monitor port number from which the function reads an EDID block.

(**) DDC level supported by both the display and the controller.

(***) This refers to the behavior of the controller and the VBE/DDC software.

3.2.2 01 - Read EDID

Input: AH= 4fh   VESA Extension
                   AL= 15h   **VBE/DDC Services**
                   BL = 01h   **Read EDID**
                   CX = 00h   Controller unit number (00 = primary controller)
                   DX = 00h   EDID block number.
                   ES:DI=   Pointer to area in which the EDID block (128 bytes) shall be returned

Output: AX=   Status (*)
                   BH=   Unchanged
                   CX =   Unchanged
                   ES:DI=   Pointer to area in which the EDID block is returned

All other registers may be destroyed

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