

---

# DDA VESA VGA PROTOCOL

Autor:

Data de publicació: 22-04-2014

**Does your monitor turn black (blank) and display no signal when Windows Vista (also Windows Server 2008) finishes the green progress bar in the boot process, right the second it turns the Num Lock on?**

**Was it okay until yesterday when you just installed Windows Vista or Windows Server 2008? Trying back Windows XP or Windows Server 2003 solves the problem?**

**Is your monitor listed as Generic Non-PnP Monitor in Windows Device Manager in XP, Vista, 2003, and 2008? Will you be surprised if I tell you it means “dear user, it’s not detected at all!?”**

**Have you tried graphics card’s latest driver, but this time screen turns black (blank) getting no signal in Windows while updating driver?**

**Have you tried your graphics card’s other DVI port after screen turned blank, and you suddenly felt like you’ve succeeded for a while, but it was stuck at some 1024×768-or-so 4:3 low-resolution on a 16:10 / 16:9 widescreen, ended up in the 1990s?**

**Have you tried calling your monitor’s (and maybe your graphics card’s) vendor’s technical support and they just told you to unplug your monitor both from VGA and wall socket, take a breath for X seconds, and then reconnect them all, at their best, with no luck? Hey pizza-boy-turned-support-technician, don’t fool us. Have you ever asked yourselves what should happen during those X seconds? 5-or-so for Samsung and Sharp, 10 for Dell and Fujitsu, 30 for ViewSonic... Probably those numbers are vendor-specific Jesus’ response time to come along for help. Well, Jesus might’ve opened the eyes of a man born blind, but a sure bet he won’t cure a monitor turned blind, especially in the world where John Michael “Ozzy” Osbourne says “what’s a DVD?”**

VGA=Video Graphics Adapter or Video Graphics Array

VESA=Video Electronics Standards Association

DDC=Display Data Channel

## Contents

### 1 Pinout

#### 1.1 VESA DPMS power saving

#### 1.2 DDC

##### 1.2.1 DDC1

- 
- 1.2.2 DDC2B
  - 1.2.3 DDC2B+
  - 1.2.4 DDC2AB/DDC2B+
  - 1.2.5 DDC/CI (formerly DDC2Bi)

### 1.3 Extended Display Identification Data

- 1.3.1 EDID 1.0/1.1
- 1.3.2 E-EDID

- 2 Links
- 3 Contributions
- 4 Source

Pinout  
Videotype: Analogue.

15 PIN HIGHDENSITY D-SUB FEMALE at the videocard.

15 PIN HIGHDENSITY D-SUB MALE at the monitor cable.

| Pin | Name | Dir | Description | Impedance/Level |
|-----|------|-----|-------------|-----------------|
|-----|------|-----|-------------|-----------------|

1  
RED

Red Video  
75  $\Omega$ , 0.7 V p-p

2  
GREEN

Green Video  
75  $\Omega$ , 0.7 V p-p

3  
BLUE

Blue Video  
75  $\Omega$ , 0.7 V p-p

---

4  
RES  
-  
Reserved

5  
GND  
  
Ground

6  
RGND  
  
Red Ground

7  
GGND  
  
Green Ground

8  
BGND  
  
Blue Ground

9  
+5V  
  
+5 VDC

10  
SGND  
  
Sync Ground

11  
ID0  
  
Monitor ID Bit 0 (optional)

12  
SDA  
  
DDC Serial Data Line

13  
HSYNC or CSYNC  
  
Horizontal Sync (or Composite Sync)

---

14

VSYNC

Vertical Sync

15

SCL

DDC Data Clock Line

Note: Direction is Computer relative Monitor.

VESA DPMS power saving

DPMS = Device Power Management Signalling

Signal   Power save mode

Normal   Standby   Supspended   Off

13 HSYNC

On

Off

On

Off

14 VSYNC

On

On

Off

Off

Power level

100%

80%

<30W

<8W

DDC

DDC = Display Data Channel

Name   Pins   Protocol

SDA   SCL

---

DDC1

12

14

Unidirection protocol (uses VSYNC (14) as clock)

DDC2B

15

I<sup>2</sup>C

DDC2B+

I<sup>2</sup>C (Bidirectional)

DDC2AB

I<sup>2</sup>C (ACCESS.bus)

DDC/CI

I<sup>2</sup>C

Note: DDC2 was never implemented

DDC1

DDC1 is a quite simple protocol. Unidirectional communication from the monitor to the video card. VSYNC (14) is used as clock.

DDC2B

Based on Philips I<sup>2</sup>C protocol. Video card is the master and monitor is always slave. Monitor has address 0xA0 (for write mode) and 0xA1 (for read mode). Control of display is not possible only exchange of information.

DDC2B+

Modification to allow bidirectional communication, point to point. Both video card and monitor can be master and slave. Control of display is possible.

DDC2AB/DDC2B+

Monitors that implement DDC2AB/DDC2B+ are full featured ACCESS.bus devices. Multiple devices on one bus. ACCESS.bus is based on Philips I<sup>2</sup>C protocol. Default address for monitor is 0x6e and 0x50 for video card (host). Extra information is transmitted thru VDI (VESA Video Display Information Format).

DDC/CI (formerly DDC2Bi)

DDC/CI = Display Data Channel Command Interface E-DDC (VESA Enhanced Extended Display Data Channel Standard) is the physical standard.

Extended Display Identification Data

EDID = Extended Display Identification Data

EDID 1.0/1.1

The EDID information consists of 128 bytes of monitor data.

Additional blocks of 128 bytes can be stored in EDID extension blocks (aka VDI) after the initial EDID block. These blocks contain additional detailed timing information. There is a flag within the EDID to indicate the existence of these blocks. VDI is not currently used in our systems.

| Version | Revision | Year | Standard                                          |
|---------|----------|------|---------------------------------------------------|
| 1       | 0        | 1994 | DDC                                               |
| 1       | 1        | 1996 | EDID Standard v2                                  |
| 1       | 2        | 1997 | EDID Standard v3                                  |
| 2       | 0        | 1997 | EDID Standard v3 (Discouraged for future designs) |
| 1       | 3        | 1999 | E-EDID Rel A                                      |

| Offset  | Name                                                          | Description                       |
|---------|---------------------------------------------------------------|-----------------------------------|
| 00h-07h | Header                                                        | 00h, FFh, FFh, FFh, FFh, FFh, 00h |
| 08h-09h | Vendor/Product ID<br>Manufacturer ID<br>provided by Microsoft |                                   |
| 0Ah-0Bh | Product ID<br>assigned by manufacturer                        |                                   |
| 0Ch-0Fh | Serial number                                                 |                                   |

---

10h

Manufacturing date

Week

1-54

11h

Year

Year-1990 (must be >3)

12h

EDID verion

Version

Current version 1

13h

Revision

Current revision 3

14h

Basic Display Parameters

Video Input Definition

bit 7: 0=analog, 1=digital

if bit 7 is digital:

bit 0: 1=DFP 1.x compatible

if bit 7 is analog:

bit 6-5: video level

00=0.7, 0.3, 01=0.714, 0.286, 10=1, .4 11=0.7, 0

bit 4: blank-to-black setup

bit 3: separate syncs

bit 2: composite sync

bit 1: sync on green

bit 0: serration vsync

15h

Width

in cm, 0 for projectors

16h

Height

in cm, 0 for projectors

---

17h  
Gamma

18h  
Power Management support

bit 7: standby  
bit 6: suspend  
bit 5: active-off/low power  
bit 4-3: display type.

00=monochrome, 01=RGB colour, 10=non RGB multicolour, 11=undefined

bit 2: standard colour space (sRGB)  
bit 1: preferred timing mode  
bit 0: default GTF supported

Note: Little-endian

E-EDID  
E-EDID = Enhanced Extended Display Identification Data Standard Up to 32kB of data.

Links

ACCESS.bus Specifications v3.0  
The I<sup>2</sup>C-Bus Specification v2.1 by Philips Semiconductors

Contributions

Joakim Ögren

Source

Various sources  
ePanorama.net: VGA analogue display connector  
Hynix HMS9xC7132/HMS9xC7134 datasheet  
Notes on Video Conversion by Samuel M. Goldwasser  
How ffbconfig and other graphic card configuration tools determine the monitor resolution capability  
VESA PlugTest April 2003: Enhanced DDC and EDID by Jack Hosek (NEC-Mitsubishi Electronics Display)

Categories:

Connector  
Video