



NVIDIA®

Drivers for Windows
***Compressed Modes
User's Guide***

Version 2.1

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COMPRESSED MODES

Overview

The Purpose of Compressed Modes

Advanced NVIDIA graphics processors and software drivers have greatly increased the number of possible display mode combinations.

Compressed Modes is NVIDIA's method for efficiently specifying any number of desired display modes without having to add huge mode lists to the Windows registry.

About This Document

- The information in this document applies to NVIDIA™ Display Drivers for Windows® NT 4.0, Windows 2000, and Windows XP—Release 40 and later—and explains how to construct a master display mode list using the compressed modes method.
- Revision History

Revision	Date	Description
1.0	3/29/02	Initial Release
1.1	3/29/02	Simplified the Adding Mode Deltas to the INF section.
2.0	8/29/02	Revised to reflect the new compressed mode architecture for Release 40 drivers.
2.1	10/24/02	Effective in version 41.00: Simplified the INF entry to eliminate separate product groupings. All products are now specified within the same INF entry. Removed use of the UseCompressedModeFormat registry key.

Using Compressed Modes

Constructing the Mode List

The basic steps for constructing a master mode list are as follows:

- 1 For a graphics card or group of graphics cards, determine which modes you want to make available at which refresh rates.

To simplify the mode delta list, group the modes according to common refresh rates. For example, all modes that are available at refresh rates of 60, 70, and 85 Hz should be grouped together.

- 2 Add the following entry to the “Add registry” section of the adapter INF.

```
HKR1,, NV_Modes, %REG_MULTI_SZ%, "{PCI ID header 1}(mode group 1);(mode group 2); ...;{PCI ID header 2} ..."
```

Where—

- *PCI ID header n* = a list, or range, of values that correspond to product PCI IDs, separated by commas. “{*}” indicates all PCI IDs.

See “Understanding the PCI ID Header” on page 3 for a detailed explanation.

- *mode group n* = string data for each mode group.

See “Understanding the Mode Group Structure” on page 3 for a detailed explanation.

- 3 Install the driver using the new INF.

1. For Windows NT 4.0 and Windows 2000—

“HKR” in the INF represents the registry key

```
HKEY_LOCAL_MACHINE \SYSTEM\CurrentControlSet\Services\nv4\Device X  
where X is one of 0, 1, 2, 3, ....
```

For Windows XP—

“HKR” in the INF represents the registry key

```
HKEY_LOCAL_MACHINE \SYSTEM\CurrentControlSet\Control\Video\GUID\XXXX  
where the “GUID” stands for an ID string and “XXXX” can be either 0000, 0001, 0002, etc.
```

The exact path represented by “GUID\XXXX” is found in the registry key

```
HKEY_LOCAL_MACHINE\hardware\Devicemap\Video\Device\VideoX,  
where “X” is one of 0, 1, 2, etc. If an NVIDIA card is the first or only card installed, the key is  
Video0, which is the most common case.
```

Understanding the PCI ID Header

The PCI ID header specifies which graphics cards to apply the succeeding modes.

- The PCI ID header consists of any combination of single PCI IDs as well as ranges. “{*}” indicates all PCI IDs:

Examples:

- {*} = all PCI IDs
- {100-309} = the inclusive range of PCI IDs from 0x100 through 0x309
- {100-103,113} = PCI ID 0x113, and the inclusive range of 0x100 through 0x103
- If the graphics card matches any one of the IDs listed in the PCI ID header, then the succeeding modes apply until another PCI ID header is encountered.

Understanding the Mode Group Structure

Mode delta groups consist of one or more modes, and are separated by a semicolon. Each mode within the mode group consists of one or more of the items shown in Figure 1.1.

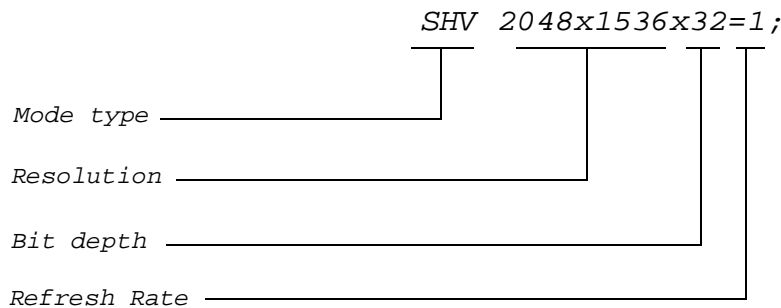


Figure 1.1 Mode Group Structure

Mode Type

The mode type entry specifies whether the modes that follow include standard or spanning modes.

- The entry can include any combination of **S**, **H**, or **V**.
 - **S** = Standard mode
 - **H** = Horizontal spanning mode
 - **V** = Vertical spanning mode

Example: “SH 800x600” specifies resolutions of 800x600 (standard) *and* 1600x600 (horizontal spanning).

- The mode type applies to all modes that follow, until another mode type is specified.

Resolution

Format - *Horizontal resolution x vertical resolution*

Bit Depth

- When no bit depth is specified, then all bit depths (**8**, **16**, and **32** bpp) are applied automatically.
- To specify a subset, list the specific bit depths, separated by commas.
Format: “[**x8**] or [**x8,16**] or [**x8,32**] or [**x16**] or [**x16,32**] or [**x32**]”
- The bit depth applies only to the resolution that it follows.

Refresh Rate

- At the end of each mode group, specify the refresh rates to apply to all the modes in the mode group.
Format: “[refresh rate code];”
- Refresh Rate Code for Standard Refresh Rates:
Specify standard refresh rates using a hexadecimal number, where each bit represents a specific refresh rate as defined in [Figure 1.2](#).

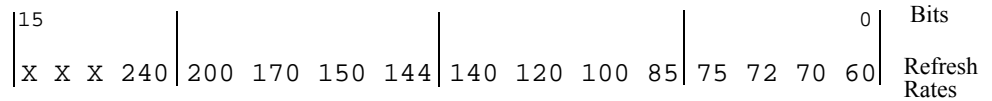


Figure 1.2 Refresh Rate Code Bit Definitions

Example: 1 = 60 Hz; 1DF = 144, 140, 120, 85, 75, 72, 70, and 60 Hz.

- Refresh Rate Code for Custom Refresh Rates
Specify custom refresh rates (those not included in [Figure 1.2](#)) using a four digit hex number in the format 8XXX, where XXX is the hexadecimal representation of the custom refresh rate.
Example: 8014 specifies a custom refresh rate of 20 Hz.

Mode List Example

Sample INF Entry

```
HKR,, NV_Modes, %REG_MULTI_SZ%, "{*}S 720x480 720x576=1;320x200 640x400=2B;SHV
1920x1200x32=1;{100-309}SH 2048x1536x32=1;1600x900x32 1920x1200x8,16=8014;
{100-18B,200}SV 1920x1080x32=10;1920x1440x32 2048x1536x8,16=39;"
```

Understanding the Sample INF Entry

- The sample INF entry can be divided into sections and subsection as follows:

```
{*}
    S    720x480 720x576=1;
        320x200 640x400=2B;
    SHV 1920x1200x32=1;
{100-309}
    SH 2048x1536x32=1;
        1600x900x32 1920x1200x8,16=8014;
{100-18B,200}
    SV 1920x1080x32=10;
        1920x1440x32 2048x1536x8,16=39;"
```

- The following table shows the actual modes that are specified by the sample INF entry:

PCI ID	Resolution	Bit Depths	Refresh Rates	Comments
Don't care	720x480	8,16,32	60Hz	
Don't care	720x576	8,16,32	60Hz	
Don't care	320x200	8,16,32	60Hz, 70Hz, 75Hz, 100Hz	
Don't care	640x400	8,16,32	60Hz, 70Hz, 75Hz, 100Hz	
Don't care	1920x1200	32	60Hz	
Don't care	2840x1200	32	60Hz	Horizontal spanning mode
Don't care	1920x2400	32	60Hz	Vertical spanning mode
0x100-0x309	2048x1536	32	60Hz	
0x100-0x309	4096x1536	32	60Hz	Horizontal spanning mode
0x100-0x309	1600x900	32	20Hz	Custom refresh rate
0x100-0x309	3200x900	32	20Hz	Horizontal spanning mode, Custom refresh rate
0x100-0x309	1920x1200	8, 16	20Hz	Custom refresh rate

PCI ID	Resolution	Bit Depths	Refresh Rates	Comments
0x100-0x309	3840x1200	8, 16	20Hz	Horizontal spanning mode, Custom refresh rate
0x100-0x18B, 0x200	1920x1080	32	85Hz	
0x100-0x18B, 0x200	1920x2160	32	85Hz	Vertical spanning mode
0x100-0x18B, 0x200	1920x1440	32	60Hz, 75Hz, 85Hz, 100Hz	
0x100-0x18B, 0x200	1920x2880	32	60Hz, 75Hz, 85Hz, 100Hz	Vertical spanning mode
0x100-0x18B, 0x200	2048x1536	8, 16	60Hz, 75Hz, 85Hz, 100Hz	
0x100-0x18B, 0x200	2048x3072	8, 16	60Hz, 75Hz, 85Hz, 100Hz	Vertical spanning mode