VIA UniChrome (Pro) Family x86_32 Display Driver Installation Guide in Fedora Core 7

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1. Summary

The document describes how to install the UniChrome (Pro) family display driver in Fedora Core 7. The system display resolution and color depth are customized by the "**Display**" tool. The "**xvidtune**" tool is used to adjust different refresh rate. The "**2D**", "**3D**", "**AIGLX**", "**MPEG 2/4 Hardware Acceleration/MC**", "**Hardware Video Overlay**", and "**TV Out**" including HDTV, DuoView and SAMM Mode settings functions are included for user's reference. The HDTV output function is only supported in CN400/CN700/ CN800/CX700(M/M2)/VX700 chips, the MPEG4 Hardware Acceleration function is only supported in CN400/CX700M(M2)/VX700 chips, and the system memory is recommended to be 64MB or above. The information in this document is provided "AS IS," without guarantee of any kind.

2. File description

This package requires the 3 files as described below.

VIA_FC7_UniChrome-GFX-v40072d.run	5,999,368	10:21 2007/10/15	VGA Driver Package for FC7
Installation.txt	49,143	15:25 2007/10/03	Driver Configuration for Xorg
Readme			This file

3. Install/Uninstall VIA UniChrome (Pro) Family Display Driver

Follow the commands to install VIA UniChrome (Pro) Family display driver binary:

```
# sh VIA_FC7_UniChrome-GFX-v40072d.run
Verifying archive integrity… All good.
Uncompressing VIA UniChrome (Pro) Family Linux Graphics Driver for Fedora Core 7 v40072d……
Please choose the job you want to do:
1. Install driver
2. Uninstall driver
```

Select the option "**1. Install driver**" to install the pre-compiled driver binary package. After installation completes, users can restart the X with "<**Ctrl**>+<**Alt**>+<←>" or running "**startx**" command in text mode. After entering X, users can check the log file "**/var/log/Xorg.0.log**" whether the 2D/DRM/DRI driver is successfully loaded without any error messages.

Note: The driver package only supports the default kernel of Fedora Core 7. The 3D performance might be lower due to Fedora Core 7's default kernel doesn't support the AGP of CX700/VX700

4. Configure Xorg

Once the display driver binary is installed, the XOrg configuration file has been modified at the same time. Therefore, users don't need to configure manually. If users want to configure manually, just refer to the "**Installation.txt**" file to customize the Xorg setting. Edit the "**xorg.conf**" file in **/etc/X11** directory for the X Windows display setting. Then proceed to setup different resolutions, color depths and the video cards. Now we can use "**startx**" command to enter X Window.

5. Configure Refresh Rate by the "xvidtune" Tool

WARNING: The incorrect use of the tool can cause permanent damage to the monitor and/or video card.

Fedora Core 7 provides the display setting tool in X Windows to setup different refresh rate (Vertical Sync in Hz). To use the "**xvidtune**" tool, open a console window in the GUI mode, and type the command "**#xvidtune**". It is really important to note that the incorrect use of the program can cause permanent damage to the monitor and/or video card. Change the vertical synchronization in the vertical display section by clicking the "**Taller**" or "**Shorter**" Button. Click on the "**test**" button to adjust the refresh rate.

6. Display modes supported

The following table summarizes the display modes supported by the display driver. To use some special display modes such as "**720x480**", "**720x576**", " **848x480**", "**856x480**", "**1024x512**", "**1280x768**" and so on, refer to the "**Installation.txt**" file in the package for how to add the Modeline in the "**Monitor**" section of the "**xorg.conf**" file. It is recommended to backup the original configure file before replacement. The display driver will enable virtual screen as default display mode settings in X-Window. Users can directly change the display's resolution in X-Window by pressing the hotkey "**<Ctrl>+<Alt>+<+>**" or "**<Ctrl>+<Alt>+<->**".

Resolution	Color Depth	Fedora Core 7.0 Refresh Rate (Hz)
640x480	8, 16, 24	60,75,85,100
720x480	8, 16, 24	60
720x576	8, 16, 24	60
800x480	8, 16, 24	60
800x600	8, 16, 24	60,75,85,100
848x480	8, 16, 24	60
856x480	8, 16, 24	60
1024x512	8, 16, 24	60
1024x768	8, 16, 24	60,75,85,100
1152x864	8, 16, 24	85
1280x720	8, 16, 24	60
1280x768	8, 16, 24	60

Resolution	Color Depth	Fedora Core 7.0 Refresh Rate (Hz)
1280x1024	8, 16, 24	60,75,85
1360x768	8, 16, 24	60
1366x768	8, 16, 24	60
1400x1050	8, 16, 24	60
1440x1050	8, 16, 24	60
1600x1200	8, 16, 24	60
1920x1080	8, 16, 24	60

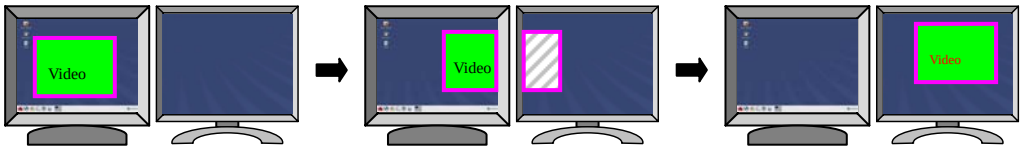
The UniChrome (Pro) family driver will probe the support range of monitor's resolutions automatically. If setting resolution is larger than the monitor's, then the driver will enter panning mode to protect the monitor. But some monitor types return wrong value so that the resolution is always "**640x480**". To bypass this issue, edit the "**Device**" section in the "**xorg.conf**" file and add the following line.

Option "NoDDCValue".

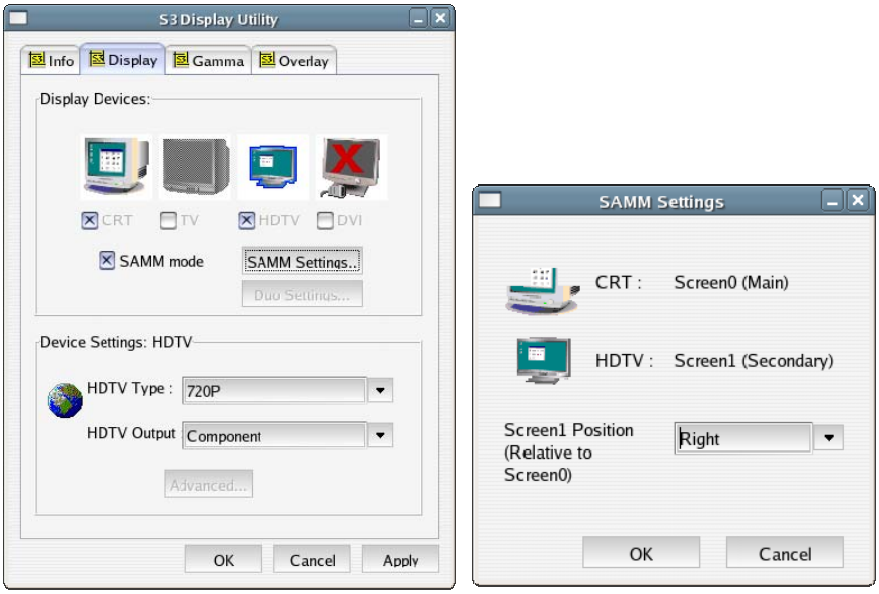
7. TV-Out Function

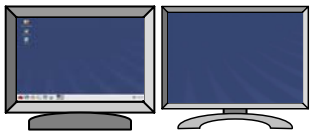
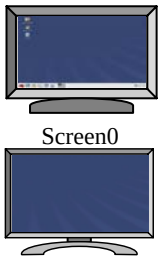
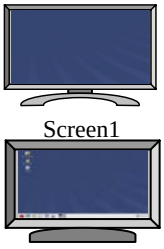
The UniChrome (Pro) Family chips support TV-Out Function. To enable the TV-Out function (default setting is DuoView mode: two different refresh rates in different display devices), VIA provides the S3utility to ease the settings for users. The S3utility is a graphical interface tool for users to set different types of TV out functions. VIA CN400/CN700/ CN800/CX700(M/M2)/VX700 north bridges support VIA's VT1625M TV encoder, which supports HDTV output type. Refer to the figure below to view the HDTV options in the S3utility. In the Display window, check the HDTV option and click "Apply". Then the TV out function will be enabled. It is important to note that to successfully enable the HDTV TV output function, make sure the BIOS supports the HDTV function.

VIA's S3utility also supports the SAMM (Single Adapter Multiple Monitor) functions for VIA's UniChrome (Pro) Family chips, which allows the X Window Desktop to be displayed in two different devices. Refer to the figure below as an example of SAMM mode, which is displayed in both LCD and TV. Users can drag the video output window from one device to another.



Init To enable the SAMM mode function in the S3utility, users should check the SAMM mode option in the Display window.



Screen0 LEFT of Screen1	Screen0 **RIGHT** of Screen1
 Screen0 Screen1	 Screen1 Screen0
Screen0 on TOP of Screen1	**Screen0 to BOTTOM of Screen1**
 Screen0 Screen1	 Screen1 Screen0

The following table summarizes the TV Output display modes in CRT and TV by using VT1625M HDTV encoder in CN400/CN700/CN800/CX700(M/M2)/VX700 respectively:

Resolution	640x480	720x480 (480p)	720x576 (576p)	800x600	1024x768	1280x720 (720p)	1920x1080 (1080i)
VT1625M	Pass	Pass (*1)	Pass (*1)	Pass	Pass	Pass	Pass

*1: There is a little shift of CRT position.

*2: The test result is under EPIA-EX MB.

8. Hardware Video Overlay/MPEG MC –MPEG1/2/4 playback

The UniChrome (Pro) Family chips support the Hardware Overlay function and H/W MPEG2/4 Acceleration feature. VIA provides the VeMP (VIA enhanced MPlayer) video player on Source Forge for users to download the package and verify. Download the VeMP package over here in SourceForge website. Then follow the commands below to install VeMP and play MPEG1/2/4 files:

```
# tar zxvf VeMP-v1.5_20061012.tgz
# cd VeMP-1.5/VeMP
# vim vobsub.c
(go to line 231 and comment off the getline() function due to it was pre-defined already in stdio.h)
# vim libvo/gtf.c
(go to line 27 and remove the“static”word prior to the round() function to avoid the non-static declaration error)
# ./VeMP-quickinstall.sh (the LAN function is optional if users want to download the CODEC package)
```

Enter the X Window and play the MPEG1/2/4 by the following commands:

```
# mplayer –vo vmix11 [options] playlist     (vmix11: H/W acceleration)
# mplayer –vo xv [options] playlist         (xv: H/W overlay)
```

The following table shows the CPU usage of VeMP for different media file types under EPIA-EX (VIA C3 1.5GHz + CX700M2).

Video Output	DVD	MPEG2	MPEG4	HD-MPEG2 720p	HD-MPEG2 1080i
xv	35	35	40	N/A	N/A
vmix11	8	9	23	8	8

Test media files:

MPEG2: 640x480x4MB.

MPEG4: 720x480x4MB.

HD-MPEG2 (720P): 1280x720Px4MB.

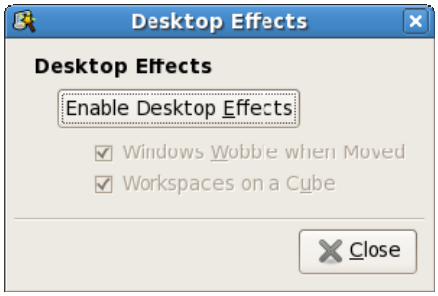
HD-MPEG2 (1080I): 1920x1080ix4MB.

9. Check 3D feature

To verify whether the 3D functionality is enabled, use the commands "**glxinfo**" and "**glxgears**" to check in X-Window. If the 3D function is enabled, users should see the following output:

```
# glxinfo
display: 0   screen: 0
direct rendering: Yes
server glx vendor string: SGI
server glx version string: 1.2
……
# glxgears
3135 frames in 5.0 seconds = 626.958 FPS
3137 frames in 5.0 seconds = 627.351 FPS
3136 frames in 5.0 seconds = 627.093 FPS
3135 frames in 5.0 seconds = 626.990 FPS
……
```

In the "**glxinfo**" command, users should see the "**Yes**" output for the direct rendering. And for using the "**glxgears**" tool, it should run the maximum value of FPS as it can. The driver package also support the AIGLX, and users can check the "AIGLX" function is enabled or not in **/var/log/Xorg.0.log**. If it is enabled, users can enable the "**Desktop Effects**" under "**System➔Preferences➔Look and Feel**"



After enabling the "**Desktop Effects**", users can use "<**Ctrl**>+<**Alt**>+< press right button of mouse and drag>" or "<**Ctrl**>+<**Alt**>+<↑>" (or <↓>/<←>/<→>) to rotate the 3D desktop. Also, users can set the "**Opacity/Saturation/Brightness**" in "**Appearance**" feature through left-clicking on window's title.

10. Test configuration

The following table summarizes the hardware configuration used for test.

CPU	VIA C7 1.5 GHz
Mainboard	EPIA-EX (CX700M+VT1625M)
DRAM	512 MB DDRII533
HDD	Seagate ST320424A 20GB
Monitor	Philips 107B3
TV	JVC 26” 26X575